UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PUBLIC SERVICE COMPANY OF COLORADO

DOCKET NO. 50-267

FORT ST. VRAIN NUCLEAR GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 60
License No. DPR-34

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Public Service Company of Colorado (the licensee) dated February 8, 1988, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. DPR-34 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 60 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective 90 days after its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jose A. Calvo

Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 20, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 60

TO FACILITY OPERATING LICENSE NO. DPR-34

DOCKET NO. 50-267

Replace the following pages of the Appendix A Technical Specifications with the attached pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
3.3-1	3.3-1
3.3-2	3.3-2a
-	3.3-2b
-	3.3-2c
3.3-3	3.3-3a
-	3.3-3b
3.3-4	3.3-4
3.3-5	3.3-5
3.3-6	3.3-6
3.3-7	3.3-7
3.3-8	3.3-8
4.4-1	4.4-1
4.4-2	4.4-2
4.4-3	4.4-3a
-	4.4-3b
-	4.4-3c
4.4-4	4.4-4a
4.4-5	4.4-4b
-	4.4-4c
-	4.4-4d
4.4-6	4.4-5a
-	4.4-5b
-	4.4-5c
4.4-7	4.4-7a
-	4.4-7b
4.4-8	4.4-8
4.4-10	4.4-10
4.4-11	4.4-10a
4.4-12	4.4-10b
-	4.4-10c
4.4-12a	4.4-11
-	4.4-11a
4.4-12b	4.4-12
-	4.4-12a
-	4.4-12b
-	4.4-12c
4.4-13	4.4-13

3.3 LIMITING SAFETY SYSTEM SETTINGS

Applicability

Applies to the trip settings for instruments and devices which provide for monitoring of reactor power, hot reheat temperature, reactor internal pressure, and moisture content of the helium coolant.

Objective

To provide for automatic protective action such that the principal process variables do not exceed a safety limit as a result of transients.

Specification LSSS 3.3 - Limiting Safety System Settings

The Limiting Safety System Settings for trip shall be as specified in Table 3.3.1. The following definitions are used in the table:

Trip Setpoint - The trip setpoint is the least conservative "as left" value for a channel to be considered Operable.

Allowable Value - The allowable value is the least conservative "as found" value for a channel to be considered Operable.

Specification LSSS 3.3

Table 3.3-1

LIMITING SAFETY SYSTEM SETTINGS

PARAMETER	FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
1. Reactor Core Limiting Safety System Settings			
a) Linear Channel-High (Neutron Flux)	Scram	Varies as a Function of Indicated Thermal Power per Figure 3.3-1	Varies as a Function of Indicated Thermal Power per Figure 3.3-1
b) Reheat Steam Temparature-High	Scram	≤ 1055 degree F	≤ 1067 degree F
c) Primary Coolant Pressure-Programmed Low	Scram	≤ 68.6 psi below normal, programmed with Circulator Inlet Temperature. Upper TRIP SETPOINT of ≥ 631.1 psia.	≤ 72.7 psi below normal, programmed with Circulator Inlet Temperature per Figure 3.3-2. Upper limit to produce trip at ≥ 627 psia.

Specification LSSS 3.3

Table 3.3-1 (Continued)

LIMITING SAFETY SYSTEM SETTINGS

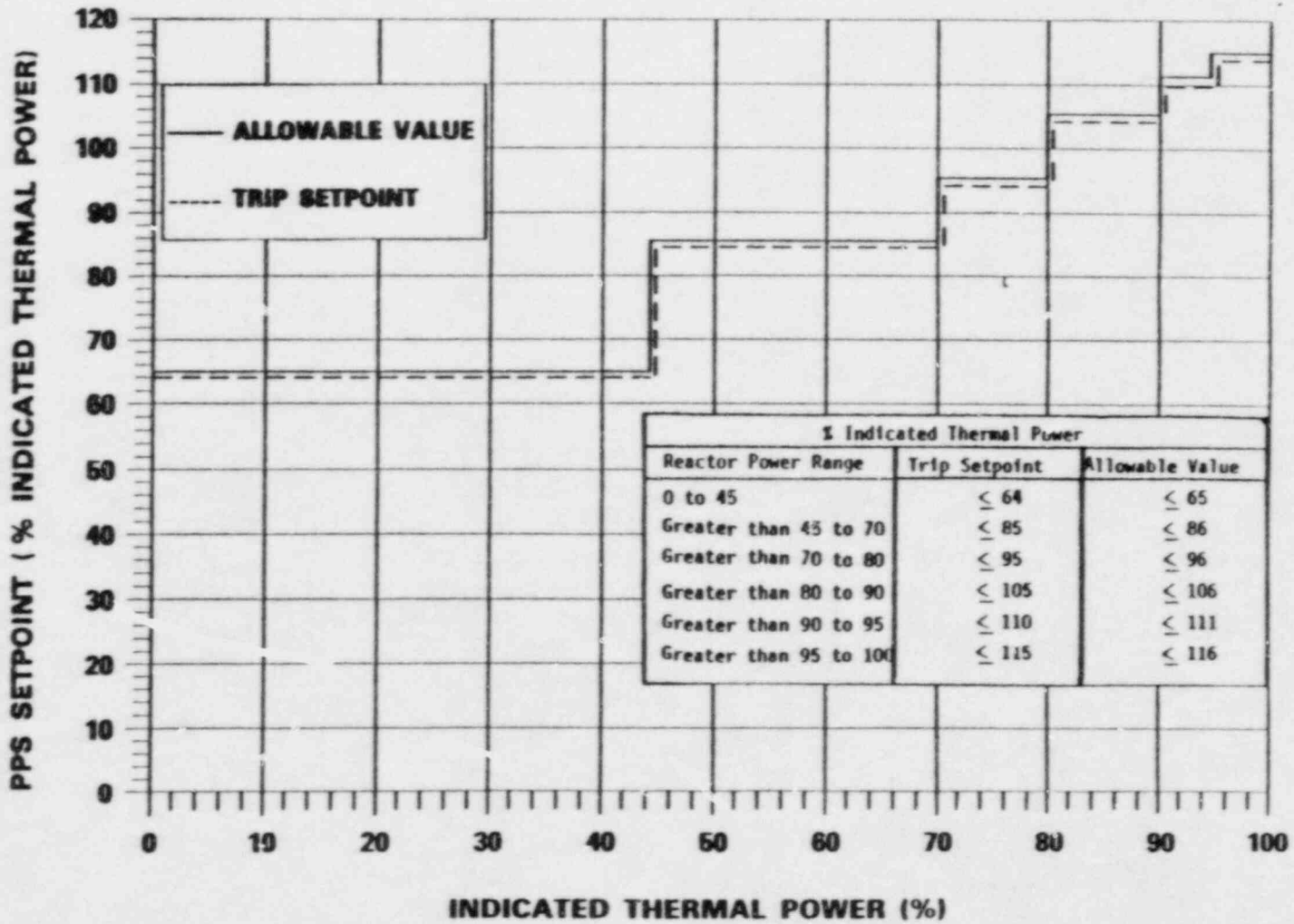
PARAMETER	FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
2. Reactor Vessel Pressure Limiting Safety System Settings			
a) Primary Coolant Pressure-Programmed High	Scram and Preselected Loop Shutdown and Steam/ Water Dump	≤ 46 psi above normal, programmed with Circulator Inlet Temperature. Upper TRIP SETPOINT of ≤ 746.3 psia. Lower TRIP SETPOINT of ≤ 538.3 psia.	≤ 52.7 psi above normal, programmed with Circulator Inlet Temperature per Figure 3.3-2. Upper limit to produce trip at ≤ 753 psia. Lower limit to produce trip at ≤ 545 psia
b) Primary Coolant Moisture-High	Scram, Loop Shutdown, and Steam/ Water Dump	≤ 60.5 degree F dewpoint temperature	≤ 62.2 degree F dewpoint temperature
c) PCRV Pressure:	Pressure Relief		
Rupture Disc (Low Set Safety Valve)		812 psig plus or minus 8 psi	820 psig

Specification LSSS 3.3

Table 3.3-1 (Continued)

LIMITING SAFETY SYSTEM SETTINGS

PARAMETER	FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
Low Set Safety Valve		796 psig plus or minus 8 psi	804 psig
Rupture Disc (High Set Safety Valve)		832 psig plus or minus 8 psi	840 psig
High Set Safety Valve		812 psig plus or minus 8 psi	820 psig
d) Helium Circulator Penetration Interspace Pressure:	Pressure Relief		
Rupture Disc (2 Per Penetration)		825 psig plus or minus 17 psi	842 psig
Safety Valve (2 Per Penetration)		805 psig plus or minus 24 psi	829 psig
e) Steam Generator Penetration Interspace Pressure:	Pressure Relief		
Rupture Disc (2 For Each Steam Generator)		825 psig plus or minus 17 psi	842 psig
Safety Valve (2 For Each Steam Generator)		475 psig plus or minus 14 psi	489 psig



% Indicated Thermal Power		
Reactor Power Range	Trip Setpoint	Allowable Value
0 to 45	≤ 64	≤ 65
Greater than 45 to 70	≤ 85	≤ 86
Greater than 70 to 80	≤ 95	≤ 96
Greater than 80 to 90	≤ 105	≤ 106
Greater than 90 to 95	≤ 110	≤ 111
Greater than 95 to 100	≤ 115	≤ 116

FIGURE 3.3-1

HIGH NEUTRON FLUX SCRAM

DETECTOR DECALIBRATION

CURVES FOR CYCLE 4

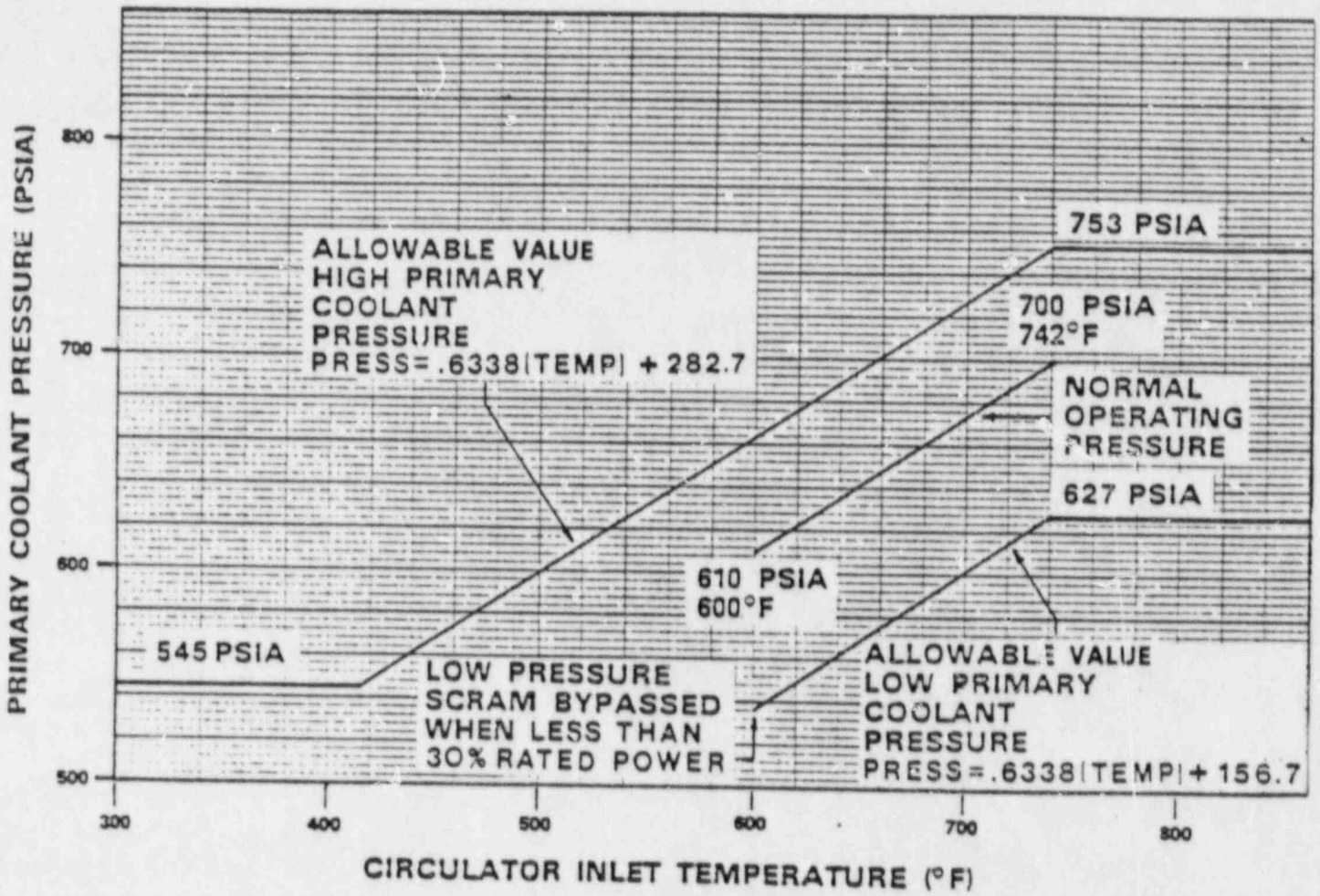


FIGURE 3.3-2

PRIMARY COOLANT PRESSURE vs. CIRCULATOR INLET TEMPERATURE

ALLOWABLE OPERATION

Basis for Specification LSSS 3.3

Safety Limits have been established in Specification SL 3.1 and SL 3.2 to safeguard the fuel particle integrity and the reactor primary coolant system barriers. Protective devices have been provided in the plant design to ensure that automatic corrective action is taken when required to prevent the Safety Limits from being exceeded during normal operation or during operational transients resulting from possible operator errors, or as a result of equipment malfunction. This specification establishes the Trip Setpoints and Allowable Values for these automatic protective devices.

Operation with setpoints less conservative than the Trip Setpoint but within the Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error, as described below.

General Methodology

The Analysis Value is the value of a parameter for which a Trip and initiation of automatic protective action is assumed to occur in FSV accident analyses (FSAR Chapter 14). Provided that the trip occurs at a value equal to or more conservative than the Analysis Value, analyses demonstrate that consequences of the accident or transient are acceptable.

ISA Standard, S67.04-1982 has been applied to these Analysis Values to arrive at Allowable Values and Trip Setpoints for each PPS parameter.

Basis for Specification LSSS 3.3 (Continued)

Linear Channel - High (Neutron Flux)

The neutron flux Trip Setpoints are established to protect the fuel particle integrity during rapid overpower transients. The power range nuclear channels respond to changes in neutron flux. During normal power operation, the channels are calibrated using a plant heat balance so that the neutron flux that is sensed is indicated as percent of Rated Thermal Power. For slow maneuvers, those where core thermal power, surface heat flux, and the heat transferred to the helium follow the neutron flux, the power range nuclear channels will indicate reactor Thermal Power. For fast transients, the neutron flux change will lead the change in heat transferred from the core to the helium due to the effect of the fuel, moderator and reflector thermal time constants. Therefore, when the neutron flux increases to the scram Trip Setpoint rapidly, the percent increase in heat flux and heat transferred to the helium will be less than the percent increase in neutron flux. Trip Setpoints that ensure a reactor scram at no greater than 140% Rated Thermal Power are sufficient for the plant because the negative temperature coefficient of reactivity and large heat capacity of the reactor limit the transient increases in fuel and helium temperatures to acceptable values. Control rod shim bank movement can result in decalibration of the external-core neutron flux detectors. To account for this potential decalibration and other instrumentation errors, the actual Trip Setpoint is administratively set less than 140% Rated Thermal Power based upon indicated power. These administratively set flux Trip Setpoints ensure the scram will occur at or less than 140% Rated Thermal Power for those postulated reactivity accidents evaluated in FSAR Section 14.2. Additional discussion on detector decalibration is given in updated FSAR Section 7.3.1.2.1.

Basis for Specification LSSS 3.3 (Continued)

Reheat Steam Temperature - High

High reheat steam temperature indicates either an increase in Thermal Power generation without an appropriate increase in helium cooling flow rate or a decrease in steam flow rate. (Reheat steam temperature in lieu of reactor core outlet helium temperature is used because of the difficulty in measuring gross helium temperature for protective system purposes.) The design of the steam generator is such that changes in hot helium temperature due to a power increase first affect the reheat steam temperature, thus allowing the latter to serve as an index of the helium temperature. A reheat steam temperature scram is provided to prevent excessive Power-to-Flow-Ratio due to a power increase or steam flow imbalance. (FSAR Section 14.2)

Primary Coolant Pressure - Programmed Low

The low primary coolant pressure Trip Setpoint has been established to maintain the fuel particle coating integrity due to loss of primary coolant as a result of a coolant leak.

Primary Coolant Pressure - Programmed High

The major potential source of primary coolant pressure increase above the normal operating range is due to water and/or steam inleakage by means of a defective evaporator-economizer-superheater subheader or tube. For a double-ended offset tube rupture, the rate of water and steam inleakage will not exceed 35 lbs/sec initially, resulting in a maximum rate of primary coolant pressure increase of approximately 1 psi per second. The normal PPS action upon detection of moisture is reactor scram, loop shutdown, and steam/water dump (FSAR Section 7.1.2.5), occurring after approximately 12 seconds, assuming rated power and flow conditions. In this situation, the peak PCRV pressure at 100% reactor power does not exceed 705 psia. The Trip Setpoint of less than or equal to 46 psi above the normal operating pressure between 25% and 100% rated power is selected: (1) to prevent false scrams due to normal plant transients, and (2) to allow adequate time for the normal protective action (high moisture) to terminate the accident while limiting the resulting peak PCRV pressure in the unlikely event that the normal protective action was inoperative. In this case, Reactor Pressure would continue to rise to the high pressure Trip Setpoint. The resulting peak PCRV pressure would be less than the PCRV Reference Pressure. The high pressure Trip Setpoint is programmed as a function of load, using helium circulator inlet temperature as the measured variable indicative of load, as shown in Figure 3.3-2. The PCRV safety valves provide the ultimate protection against primary coolant system pressure exceeding the PCRV Reference Pressure of 845 psig.

Basis for Specification LSSS 3.3 (Continued)

Primary Coolant Moisture - High

The high moisture Trip Setpoint corresponding to 60.5 degrees F dewpoint was established, considering the moisture monitor characteristics and the necessity to minimize water inleakage to the primary coolant system. A Trip would be reached after several hours of full power operation with a minimum water/steam inleakage rate in excess of about 20 lbs/hr. Below that inleakage rate, the Trip Setpoint would never be reached, but the indicating instruments would show an abnormal condition. For maximum design leakage rates, the system behavior is as discussed in the preceding section on Primary Coolant Pressure-Programmed High. Backup protective action is provided by the high primary coolant pressure scram, loop shutdown, and dump of a pre-selected loop and remaining loop steam depressurization. (FSAR Sections 7.1.2.3 and 7.1.2.4.)

PCRV Pressure

The PCRV safety valves provide the ultimate protection against primary coolant system pressure exceeding the PCRV Reference Pressure of 845 psig. This engineered safeguard system consists of the isolation valves, the rupture discs, the relief valves, and the containment tank. Two safety valves are provided, either of which is adequate to prevent exceeding the PCRV Reference Pressure in the event of a steam generator subheader rupture, which is the only credible means of substantially increasing the primary coolant pressure. If the pressure in the PCRV were to rise significantly above the Normal Working Pressure, the low-set rupture disc would rupture within the range of 804 psig (-1%), to 820 psig (+1%). The low set safety valve, set at 796 psig plus or minus 1%, would be wide open and relieving at full capacity at or above 820 psig (3% accumulation). If the pressure still continued to rise, the high-set rupture disc would rupture between 824 psig and 840 psig. The high-set safety valve, set at 812 psig plus or minus 1%, would be relieving at full capacity above 836 psig (3% accumulation). As the pressure decreased, the high-set safety valve would close at a pressure of approximately 690 psig and the low-set safety valve at approximately 677 psig; the corresponding primary system pressure would be approximately 737 psig when the low-set safety valve closed. The minimum permissible trip setpoint of each PCRV overpressure relief train rupture disc and relief valve is specified to provide assurance that primary coolant helium will not be vented to atmosphere during primary coolant pressure surges, resulting from transients or accidents, in which pressures do not approach the Allowable Value and thereby do not challenge the integrity of the PCRV. (FSAR Section 6.8.3)

Basis for Specification LSSS 3.3 (Continued)

Helium Circulator Penetration Interspace Pressure

The penetration interspaces are protected against pressures exceeding PCRV Reference Pressure (845 psig). The safety valves are set at 805 psig and rupture discs are set at 825 psig (nominal). A redundant safety valve and rupture disc are provided. The rupture discs would burst in the pressure range of 808 psig (-2%) to 842 psig (+2%). The safety valves would open in the range of 781 psig (-3%) to 829 psig (+3%) and would relieve at full capacity at 886 psig (10% accumulation). The safety valves would reseat at about 725 psig. The safety valve and rupture disc relieving pressures were specified so as to comply with the ASME Boiler and Pressure Vessel Code, Section III, Class B, Nuclear Vessels, for overpressure protection. The minimum permissible trip setpoint of each rupture disc and associated relief valve is specified to provide assurance that PCRV penetration interspace helium, which could potentially be radioactive, will not be vented to atmosphere during interspace pressure surges in which pressures do not approach the Allowable Value and thereby do not challenge the integrity of the PCRV penetration. (FSAR Section 5.8.2)

Steam Generator Penetration Interspace Pressure

The six steam generator penetration interspaces in each loop are provided with common upstream rupture discs and safety valves to protect against pressures exceeding PCRV Reference Pressure (845 psig). A redundant safety valve and rupture disc are provided. The rupture discs would burst in the pressure range of 808 psig (-2%) to 842 psig (+2%), with a nominal setting of 825 psig. The safety valves are each set at 475 psig which allows for a pressure drop in the inlet lines of 370 psi when relieving at valve capacity. The minimum permissible trip setpoint of each rupture disc and associated relief valve is specified to provide assurance that PCRV penetration interspace helium, which could potentially be radioactive, will not be vented to atmosphere during interspace pressure surges in which pressures do not approach the Allowable Value and thereby do not challenge the integrity of the PCRV penetration. (FSAR Section 5.8.2)

4.4 INSTRUMENTATION AND CONTROL SYSTEMS - LIMITING CONDITIONS FOR OPERATION

Applicability

Applies to the plant protective system and other critical instrumentation and controls.

Objective

To assure the operability of the plant protective system and other critical instrumentation by defining the minimum operable instrument channels and trip settings.

Specification LCO 4.4.1 - Plant Protective System Instrumentation, Limiting Conditions for Operation

The limiting conditions for the plant protective system instrumentation are shown on Tables 4.4-1 through 4.4-4. These tables utilize the following definitions:

Degree of Redundancy - Difference between the number of operable channels and the minimum number of operable channels which when tripped will cause an automatic system trip.

Operable Channel - A channel is operable if it is capable of fulfilling its design functions.

Inoperable Channel - Opposite of operable channel.

Trip Setpoint - The trip setpoint is the least conservative "as left" value for a channel to be considered Operable.

Allowable Value - The allowable value is the least conservative "as found" value for a channel to be considered Operable.

Tables 4.4-1 through 4.4-4 are to be read in the following manner: If the minimum operable channels or the minimum degree of redundancy for each functional unit of a table cannot be met or cannot be bypassed under the stated permissible bypass conditions, the following action shall be taken:

For Table 4.4-1, the reactor shall be shut down within 12 hours, except that to facilitate maintenance on the Plant Protective System (PPS) moisture monitors, the moisture monitor input trip functions to the Plant Protective System which cause scram, loop shutdown, circulator trip, and steam water dump may be disabled for up to 72 hours. During the time that the Plant Protective System moisture monitor trips are disabled, an observer in direct communication with the reactor operator shall be positioned in the control room in the location of pertinent instrumentation. The observer shall continuously monitor the primary coolant moisture levels indicated by at least two moisture monitors and the primary coolant pressure indications, and shall alert the reactor operator to any indicated moisture or pressure change. During the time in which the trip functions are disabled the requirements of LCO's 4.2.10 and 4.2.11 shall be met and primary coolant shall not exceed a moisture concentration of 100 ppmv.

For Table 4.4-2, the affected loop shall be shut down within 12 hours.

For Table 4.4-3, perform one of the following within 12 hours:

a. The reactor shall be shutdown, or

b. the affected helium circulator shall be shutdown.

For Table 4.4-4, the reactor shall be shut down within 24 hours.

If, within the indicated time limit, the minimum number of operable channels and the minimum degree of redundancy can be reestablished, the system is considered normal and no further action needs to be taken.

Specification LCO 4.4.1

Table 4.4-1 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM, SCRAM

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
1a.	Manual Scram (Control Room)	Not Applicable	Not Applicable
1b.	Manual Scram (Outside Control Room)	Not Applicable	Not Applicable
2.	Startup Channel-High Count Rate	≤ 8.3E+04 cps	≤ 9.3E+04 cps
3a.	Linear Channel-High Channels 3,4,5 (Neutron Flux)	----------See Table 3.3-1-------	
3b.	Linear Channel-High Channels 6,7,8 (Neutron Flux)	----------See Table 3.3-1-------	
4.	Primary Coolant Moisture High Level Monitor	≤ 60.5 degree F dewpoint	≤ 62.2 degree F dewpoint
	Loop Monitor	≤ 20.4 degree F dewpoint	≤ 22.1 degree F dewpoint
5.	Reheat Steam Temperature -High	≤ 1055 degree F	≤ 1067 degree F

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-1 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM SCRAM

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
6.	Primary Coolant Pressure -Programmed Low	---------See Table 3.3-2---------	
7.	Primary Coolant Pressure -Programmed High	---------See Table 3.3-2---------	
8.	Hot Reheat Header Pressure -Low	≥ 44 psig	≥ 43 psig
9.	Main Steam Pressure-Low	≥ 1529 psig	≥1517 psig
10.	Plant Electrical System-Loss	≥ 278V ≤ 31.5 Seconds	≥ 266V ≤ 35 Seconds
11.	Two Loop Trouble	Not Applicable	Not Applicable
12.	High Reactor Building Temperature (Pipe Cavity)	≤ 161 degree F	≤ 166 degree F

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1

TABLE 4.4-1 (Part 2)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM, SCRAM

NO.	FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS
1a.	Manual (Control Room)	1	0	None
1b.	Manual (Outside Control Room)	2 (f)	1	None
2.	Startup Channel-High Count Rate	2	1	Reactor Mode Switch in "RUN"
3a.	Linear Channel-High, Channels 3, 4, 5	2 (f)	1	None
3b.	Linear Channel-High, Channels 6, 7, 8	2 (f)	1	None
4.	Primary Coolant Moisture High Level Monitor	1 (f,t)	1(c)	(h2)
	Loop Monitor	2/Loop (f,t)	1/Loop	(h1)
5.	Reheat Steam Temperature - High	2 (b,f)	1	None
6.	Primary Coolant Pressure - Programmed Low	2 (f,k)	1	Less Than 30% Rated Power
7.	Primary Coolant Pressure - Programmed High	2 (f,k)	1	None
8.	Hot Reheat Header Pressure - Low	2 (f)	1	Less Than 30% Rated Power
9.	Main Steam Pressure - Low	2 (f)	1	Less Than 30% Rated Power
10.	Plant Electrical System - Loss	2 (e,f)	1	None
11.	Two Loop Trouble	2	1	Reactor Mode Switch in "Fuel Loading"
12.	High Reactor Building Temperature (Pipe Cavity)	2 (f)	1	None

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-2 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS
FOR THE PLANT PROTECTIVE SYSTEM, LOOP SHUTDOWN

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
1a.	Deleted		
1b.	Deleted		
1c.	Deleted		
1d.	Deleted		
1e.	Deleted		
1f.	Deleted		
2a.	Deleted		
2b.	Deleted		
2c.	Deleted		
2d.	Deleted		
3a.	Loop 1 Shutdown Logic	Not Applicable	Not Applicable
3b.	Loop 2 Shutdown Logic	Not Applicable	Not Applicable
4a.	Circulator 1A and 1B Shutdown - Loop Shutdown Logic	Not Applicable	Not Applicable

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-2 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS
FOR THE PLANT PROTECTIVE SYSTEM, LOOP SHUTDOWN

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
4b.	Circulator 1C and 1D Shutdown - Loop Shutdown Logic	Not Applicable	Not Applicable
5a.	Steam Generator Penetration Overpressure, Loop 1	≤ 796 psig	≤ 801 psig
5b.	Steam Generator Penetration Overpressure, Loop 2	≤ 796 psig	≤ 801 psig
6a.	High Reheat Header Activity, Loop 1	≤ 3.2 mrem/hr Above Background	≤ 3.5 mrem/hr Above Background
6b.	High Reheat Header Activity, Loop 2	≤ 3.2 mrem/hr Above Background	≤ 3.5 mrem/hr Above Background
7a.	Low Superheat Header Temperature, Loop 1 (p)	≥ 798 degree F	≥ 794 degree F
7b.	Low Superheat Header Temperature, Loop 2 (p)	≥ 798 degree F	≥ 794 degree F
7c.	High Differential Temperature Between Loop 1 and Loop 2 (p)	≤ 44.8 degree F	≤ 46.7 degree F

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1

TABLE 4.4-2 (Part 2)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM, LOOP SHUTDOWN

NO.	FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS
1a.	Deleted			
1b.	Deleted			
1c.	Deleted			
1d.	Deleted			
1e.	Deleted			
1f.	Deleted			
2a.	Deleted			
2b.	Deleted			
2c.	Deleted			
2d.	Deleted			
3a.	Loop 1 Shutdown Logic	2	1	None
3b.	Loop 2 Shutdown Logic	2	1	None

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1

TABLE 4.4-2 (Part 2)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM LOOP SHUTDOWN

NO.	FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	[illegible]
4a.	Circulator 1A and 1B Shutdown - Loop - Shutdown Logic	2	1	None
4b.	Circulator 1C and 1D Shutdown - Loop Shutdown Logic	2	1	None
5a.	Steam Generator Penetration Overpressure, Loop 1	2 (f)	1	None
5b.	Steam Generator Penetration Overpressure, Loop 2	2 (f)	1	None
6a.	High Reheat Header Activity, Loop 1	2 (f)	1	None
6b.	High Reheat Header Activity, Loop 2	2 (f)	1	None
7a.	Low Superheat Header Temperature, Loop 1 (p)	2 (f)	1	Less Than 30% Rated Power
7b.	Low Superheat Header Temperature, Loop 2 (p)	2 (f)	1	Less Than 30% Rated Power
7c.	High Differential Temperature Between Loop 1 and Loop 2 (p)	2 (f)	1	Less Than 30% Rated Power

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-3 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS FOR THE PLANT PROTECTIVE SYSTEM, CIRCULATOR TRIP

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
1.	Circulator Speed - Low	≤ 1850 rpm Below Normal As Programmed by Feedwater Flow	≤ 2035 rpm Below Normal As Programmed by Feedwater Flow
2a.	Loop 1, Fixed Feedwater Flow - Low (Both Circulators)	≥ 230,500 lb/hr (20% of normal Full Load)	≥ 230,500 lb/hr (20% of normal Full Load)
2b.	Loop 2, Fixed Feedwater Flow - Low (Both Circulators)	≥ 230,500 lb/hr (20% of normal Full Load)	≥ 230,500 lb/hr (20% of normal Full Load)
3.	Loss of Circulator Bearing Water	≥ 459 psid	≥ 454 psid
4.	Circulator Penetration Trouble	≤ 796 psig	≤ 801 psig
5.	Circulator Drain Malfunction	≥ 8.5 psid	≥ 8.0 psid
6.	Circulator Speed - High Steam	≤ 11,495 rpm	≤ 11,684 rpm
7.	Manual	Not Applicable	Not Applicable

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-3 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS FOR THE PLANT PROTECTIVE SYSTEM, CIRCULATOR TRIP

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
8.	Circulator Seal Malfunction	≥ -5.2" H20, ≤ +74.8" H20	≥ -6.1" H20, ≤ +76.1" H20
9.	Circulator Speed - High Water	≤ 8,589 rpm	≤ 8,786 rpm

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1

TABLE 4.4-3 (Part 2)

INSTRUMENT OPERATING REQUIREMENTS FOR PLANT PROTECTIVE SYSTEM, CIRCULATOR TRIP

NO.	FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS
1.	Circulator Speed - Low (r)	2 (f)	1	Less Than 30% Rated Power
2a.	Loop 1, Fixed Feed-water Flow - Low (Both Circulators)	2 (f)	1	Less Than 30% Rated Power
2b.	Loop 2, Fixed Feed-water Flow - Low (Both Circulators)	2 (f)	1	Less Than 30% Rated Power
3.	Loss of Circulator Bearing Water (r)	2 (f)	1	None
4.	Circulator Penetration Trouble (r)	2 (f)	1	None
5.	Circulator Drain Malfunction (r)	2 (f)	1	None
6.	Circulator Speed - High Steam (r)	2 (f)	1	None
7.	Manual	1	0	None
8.	Circulator Seal Malfunction (r)	2 (f)	1	Opposite loop shutdown or circulator seal malfunction trip of other circulator in same loop
9.	Circulator Speed - High Water	2 (f)	1	None

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

Specification LCO 4.4.1

Table 4.4-4 (Part 1)

INSTRUMENT OPERATING REQUIREMENTS FOR THE PLANT PROTECTIVE SYSTEM, ROD WITHDRAWAL PROHIBIT (RWP)

NO.	FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
1.	Startup Channel-Low Count Rate	≥ 4.2 cps	≥ 3.2 cps
2a.	Linear Channel-Low Power RWP (Channels 3, 4 and 5)	> 5% Indicated Thermal Power (m)	>5% Indicated Thermal Power
2b.	Linear Channel-Low Power RWP (Channels 6, 7 and 8)	> 5% Indicated Thermal Power (m)	>5% Indicated Thermal Power
3a.	Linear Channel-High Power RWP (Channels 3, 4 and 5)	< 30% Indicated Thermal Power (n)	< 30% Indicated Thermal Power
3b.	Linear Channel-High Power RWP (Channels 6, 7 and 8)	< 30% Indicated Thermal Power (n)	< 30% Indicated Thermal Power

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1

TABLE 4.4-4 (Part 2)

INSTRUMENT OPERATING REQUIREMENTS
FOR REACTOR PROTECTIVE SYSTEM, ROD WITHDRAWAL PROHIBIT (RWP)

NO.	FUNCTIONAL UNIT	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS
1.	Startup Channel - Low Count Rate	2	1	Above 1.0E-03% Rated Power
2a.	Linear Channel - Low Power RWP (Channels 3, 4, and 5)	2	1	(g)
2b.	Linear Channel - Low Power RWP (Channels 6, 7, and 8)	2	1	(g)
3a.	Linear Channel - High Power RWP (Channels 3, 4, and 5)	2 (f)	1	None
3b.	Linear Channel - High Power RWP (Channels 6, 7, and 8)	2 (f)	1	None

Notes for Tables 4.4-1 through 4.4-4 are on Pages 4.4-8 and 4.4-9

SPECIFICATION LCO 4.4.1
NOTES FOR TABLES 4.4-1 THROUGH 4.4-4

a) Deleted.

b) Two thermocouples from each loop, total of four, constitute one channel. For each channel, two thermocouples must be operable in at least one operating loop for that channel to be considered operable.

c) With one primary coolant high level moisture monitor tripped, trips of either loop primary coolant moisture monitors will cause full scram. Hence, number of operable channels (1) minus minimum number required to cause scram (0) equals one, the minimum degree of redundancy.

d) Deleted.

e) One channel consists of three undervoltage relays each monitoring a single phase of a 480 VAC essential bus. A channel trip will occur when two of the three undervoltage relays comprising that channel operate after a preset time delay indicating loss of bus voltage. Initiation of a scram requires two of the three undervoltage relays on two of the three 480 VAC essential buses to operate.

f) The inoperable channel must be in the tripped condition, unless the trip of the channel will cause the protective action to occur. Failure to trip the inoperable channel requires taking the appropriate corrective action as listed on Pages 4.4-1 and 4.4-2 within the specified time limit.

g) RWP bypass permitted if the bypass also causes associated single channel scram.

h1) For loop monitors only, permissible bypass conditions include:
I. Any circulator buffer seal malfunction.
II. Loop hot reheat header high activity.
III. As stated in LCO 4.9.2.

h2) For high level monitors only, permissible bypass conditions include:
I. As stated in LCO 4.9.2.

j) Deleted.

k) One operable helium circulator inlet thermocouple in an operable loop is required for the channel to be considered operable.

m) Low Power RWP bistable resets at 4% after reactor power initially exceeds 5%.

n) Power range RWP bistables automatically reset at 10% after reactor power is decreased from greater than 30%. The RWP may be manually reset between 10% and 30% power.

p) Item 7a. must be accompanied by item 7c. for Loop 1 shutdown.
Item 7b. must be accompanied by item 7c. for Loop 2 shutdown.

Basis for Specification LCO 4.4.1

The plant protection system automatically initiates protective functions to prevent established limits from being exceeded. In addition, other protective instrumentation is provided to initiate action which mitigates the consequences of accidents. Some protective actions are necessary only during startup and/or Low Power and require bypass at power; others are required during power operation and need to be bypassed at startup and/or Low Power. A simple method, based on a minimum of administrative control, has been devised to sequence and bypass protective actions. The equipment consists of two selector switches (Reactor Mode and Interlock Sequence) on the reactor control board. This specification provides the limiting conditions for operation necessary to preserve the effectiveness of these instrument systems.

If the minimum operable channels or the minimum degrees of redundancy for each functional unit of a table cannot be met or cannot be bypassed under the stated permissible bypass conditions, the following action shall be taken:

For Table 4.4-1, the reactor shall be shut down within 12 hours.

For Table 4.4-2, the affected loop shall be shut down within 12 hours.

For Table 4.4-3, perform one of the following within 12 hours:

1) The reactor shall be shutdown, or

2) the affected helium circulator shall be shutdown.

For Table 4.4-4, the reactor shall be shut down within 12 hours.

If, within the indicated time limit, the minimum number of operable channels and the minimum degree of redundancy can be reestablished, the system is considered normal and no further action needs to be taken.

The trip level settings are included in this section of the specification. The bases for these settings are briefly discussed below. Additional discussions pertaining to the scram, loop shutdown and circulator trip inputs may be found in Sections 7.1.2.3, 7.1.2.4 and 7.1.2.6, respectively, of the FSAR. High moisture instrumentation is discussed in Section 7.3.2 of the FSAR.

Basis for Specification LCO 4.4.1 (Continued)

To accommodate the instrument drift assumed to occur between operational tests and the accuracy to which Trip Setpoints can be measured and calibrated, Allowable Values and Trip Setpoints have been specified in Part 1 of Tables 4.4-1 through 4.4-4. The methodology used for calculating the Allowable Values and Trip Setpoints is discussed in Technical Specification LSSS 3.3.

a. Scram Inputs

The simultaneous insertion of the control rods will be initiated by the following conditions:

Manual Scram

A manual scram is provided to give the operator means for emergency shutdown of the reactor independent of the automatic reactor protective system. The Reactor Mode Switch (RMS) in the "off" position also causes a manual scram.

Start-up Channel - High Count Rate

High start-up count rate is provided as a scram for use during fuel loading, preoperational testing, or other low-power operations.

Linear Channel - High (Neutron Flux)

See Technical Specification LSSS 3.3.

Basis for Specification LCO 4.4.1 (Continued)

Primary Coolant Moisture - High

See Technical Specification LSSS 3.3.

Reheat Steam Temperature - High

See Technical Specification LSSS 3.3.

Primary Coolant Pressure - Programmed Low

See Technical Specification LSSS 3.3.

Primary Coolant Pressure - Programmed High

See Technical Specification LSSS 3.3.

Hot Reheat Header Pressure - Low

Low reheat steam pressure is an indication of either a cold reheat steam line or a hot reheat steam line rupture in a portion of line common to both loops. Loss of the cold reheat steam line results in loss of the steam supply to the circulators which necessitates plant shutdown. The direct scram in this case precedes a scram resulting from the two-loop trouble. The loss of either steam line results in loss of plant generation output, and a reactor scram is appropriate in this situation. The Trip Setpoint is selected to be below normal operating and transient levels, which vary over a wide range.

Main Steam Pressure - Low

Low main steam pressure is an indication of main steam line rupture or loss of feedwater flow. Immediate shutdown of the reactor is appropriate in this case. In addition, the superheater outlet stop check valves are automatically closed to reroute main steam to the flash tank (through the individual loop bypass valves and desuperheaters). This is required for the continued operation of the helium circulators on steam. The Trip Setpoint is selected to be below normal operating levels and system transients.

Plant Electrical System - Loss

Loss of plant electrical system power requires a scram to prevent any Power-to-Flow mismatches from occurring. A preset time delay is provided following a power loss before the scram is initiated to allow an emergency diesel generator to start. If it does start, the scram is avoided.

Basis for Specification LCO 4.4.1 (Continued)

Two-Loop Trouble Scram Logic

Operation on one loop at a maximum of about 50% power may continue following the shutdown of the other loop (unless preceded by scram as in the case of high moisture). Onset of trouble in the remaining loop (two-loop trouble) results in a scram. Trouble is defined as a signal which normally initiates a loop shutdown. Similarly, simultaneous shutdown signals to both loops result in shutdown of one of the two loops only, and a reactor scram. However, actuation of both Steam Line Rupture Detection/Isolation System (SLRDIS) loops, effectively shuts down both loops because it sends an actuation logic signal to all four circulator trip logic channels. The consequences of a two-loop shutdown and subsequent loss of forced circulation have been analyzed and found to be acceptable. The consequences are bounded by an interruption of forced circulation cooling accident described in FSAR Section 14.4.2.2, Safe Shutdown Cooling.

High Reactor Building Temperature (Pipe Cavity)

High temperature in the pipe cavity would indicate the presence of a steam leak. A steam leak or pipe rupture under the PCRV within the support ring would also be detectable in the pipe cavity, therefore only one set of sensors and logic is required to monitor both areas. The setpoint has been set above the SLRDIS pre-trip temperature alarm.

Basis for Specification LCO 4.4.1 (Continued)

b. Loop Shutdown Inputs

The following loop shutdown inputs are provided primarily for equipment protection and are not relied upon to protect Safety Limits. Malfunction of these items could prevent a scram due to loss of the two loop trouble scram input.

Shutdown of Both Circulators (Loop Shutdown Logic)

Shutdown of both circulators in one loop is a loop shutdown input so that secondary coolant flow is automatically isolated to the affected loop's steam generator upon loss of primary coolant flow in that loop. This loop shutdown ensures proper reactor protection system action (scram) through the two-loop trouble scram in the event of the loss of all four circulators. Low feedwater flow to both loops can result in automatic trip of all four circulators, which would activiate the two loop trouble scram.

Steam Generator Penetration Overpressure (Loop 1/Loop 2)

Steam generator penetration overpressure is indicative of a pipe rupture within the penetration. A loop shutdown is appropriate for such an accident, and the helium pressurizing line to the penetration is closed to prevent moisture backflow to the purified helium system. The penetration overpressure is handled by relief valves; however, to minimize the amount of steam/water released, the steam generator contents are also dumped.

The steam generator interspace rupture discs are set at 825 psig (nominal). The burst pressure range (plus or minus 2%) is 808 psig to 842 psig (Technical Specification LSSS 3.3, Table 3.3-1). The relief valve is sized to allow a 370 psi pressure drop in a safety valve inlet line when the valve is relieving at nameplate capacity of 126,000 lb/hr superheated steam at 1000 degree F. This prevents the penetration pressure from exceeding the reference pressure of 845 psig.

Basis for Specification LCO 4.4.1 (Continued)

High Reheat Header Activity - (Loop 1/Loop 2)

High reheat header activity is an indication of a reheater tube rupture resulting in leakage of reactor helium into the steam system. The Trip Setpoint ensures detection of major reheat tube ruptures and an on-scale reading, with up to design value circulating activity for post accident monitoring. Detection of smaller size leaks or leaks with low circulating coolant activity can be detected and alarmed by the backup reheat condensate monitors and/or the air ejector monitor.

Low Superheat Header Temperature (Loop 1/Loop 2) and High Differential Temperature Between Loop 1 and Loop 2

Low superheat header temperature in a loop is indicative either of a feedwater valve or controller failure yielding an excessive loop feedwater flow rate or a deficiency of helium flow rate, and a loop shutdown is appropriate. The required coincident high differential temperature between loops functions to prevent the loop Trip from occurring during normal operation at low main steam temperatures such as in a normal plant shutdown.

Basis for Specification LCO 4.4.1 (Continued)

c. Circulator Shutdown Inputs

All circulator shutdown inputs are equipment protection items. With the exception of Circulator Speed High on water turbine drive, all circulator shutdown inputs are connected to the two-loop trouble scram logic through the loop shutdown system. These items are included in Table 4.4-3 because a malfunction could prevent a scram due to loss of the two-loop trouble scram input. Circulator Speed High on water turbine drive is included to afford protection to the water turbine assembly against the effects of overspeed during continued core cooling upon loss of steam drive capability.

Circulator Speed - Low

Too low a circulator speed causes a mismatch between thermal power input and heat removal (feedwater flow) in a steam generator, which may result in flooding the superheater section. The circulator Trip causes an automatic adjustment, as required, in the turbine governor setting, feedwater flow rate, and remaining circulator speed to maintain stable steam pressure and temperature conditions.

Loop 1/Loop 2 Fixed Feedwater Flow - Low

The Fixed Feedwater Flow - Low is an equipment protection feature designed to protect the steam generator from overheating for complete loss of feedwater flow.

Loss of Circulator Bearing Water

In order to prevent circulator damage upon loss of normal and backup bearing water supplies, a gas pressurized water accumulator is fired when water pressure falls below the Trip Setpoint value. The Trip Setpoint value is selected so that adequate water pressure is available during circulator coastdown, which lasts for about 30 seconds, to maintain clearances within the circulator bearings of at least 0.001 in. Tests and analyses have shown that a Trip at 450 psid provides substantial clearance margin above 0.001 in. when the circulators are operating at normal speeds.

Basis for Specification LCO 4.4.1 (Continued)

Circulator Penetration Trouble

Circulator penetration overpressure is indicative of a pipe rupture within the penetration. A circulator Trip is appropriate for such an accident and the helium pressurizing line to the penetration is closed to prevent moisture backflow to the purified helium system. The overpressure is handled by the penetration relief valves. The penetration interspace rupture discs are set at 825 psig (nominal). The burst pressure range (plus or minus 2%) is 808 psig to 842 psig (Technical Specification LSSS 3.3, Table 3.3-1). The relief valve is sized to allow a 40 psi pressure drop in the safety valve inlet line when the valve is relieving at nameplate capacity (170 gpm).

Circulator Drain Malfunction

This Trip is provided to prevent steam from entering the bearing of an operating circulator. A differential pressure controller is utilized to maintain the bearing water main drain pressure above the steam turbine exhaust pressure. When the pressure differential drops, the steam water drain control valves are opened to prevent steam from entering the bearings. If the above controls do not work, three PPS differential pressure switches for each circulator, set at greater than or equal to 8.5 psid, will initiate an automatic shutdown of the circulator.

Circulator Speed - High Steam

The speed sensing system response and Trip setting are chosen so that under the maximum overspeed situation possible (loss of restraining torque) the circulator will remain within design criteria.

Circulator Trip - Manual (Steam/Water)

A manual Trip of each circulator for both steam and water turbine drives is available so that in an emergency an operator can trip a circulator when required.

Basis for Specification LCO 4.4.1 (Continued)

Circulator Seal Malfunction (Low/High)

A high reverse differential of -6.1" H20 would be reasonable evidence that bearing water is leaking into the primary coolant system. An increasing differential pressure of +76.1" H20 would be reasonable evidence that primary coolant is leaking into the bearing water and thus into the closed circulator service system. In both cases a circulator trip with brake and seals set is appropriate.

Circulator Speed - High Water

The Trip Setpoint has been established above normal operating speed. Equipment testing ensures that this Trip Setpoint will prevent failure due to fatigue cracking.

Steam Leak Detection in the Reactor Building

Steam Leak Detection in the Reactor Building is required for equipment qualification of Safe Shutdown Cooling Systems. The ALLOWABLE VALUE is set at ≤ 52.8 degrees F per minute rate of rise in order to prevent exceeding the harsh environment temperature profile to which the safe shutdown electrical equipment is qualified, per the requirements of 10CFR50.49. A setpoint calculation analysis performed per ISA Standard S67.04 and RG1.105 results in the stated ALLOWABLE VALUE and TRIP SETPOINT as specified in the LCO and this basis. The TRIP SETPOINT has been established with sufficient margin between the technical specification limit for the process variable and the nominal TRIP SETPOINT to allow for 1) inaccuracy of the instruments; 2) uncertainties in the calibration; 3) instrument drift that could occur during the interval between calibrations; and 4) inaccuracies due to ambient temperature changes, vibration and other environmental conditions. The TRIP SETPOINT is set at ≤ 52.3 degrees F per minute rate of rise until such time as the drift characteristics of the detection system are better understood from actual plant operating experience and the assumptions used in the setpoint analysis are verified.

SLRDIS design incorporates two panels, each with its own set of sensors for the Reactor and Turbine Buildings and dual logic trains in each panel. The SLRDIS design preserves the single failure concept. A single failure will neither cause nor prevent SLRDIS actuation in the event of a high energy line break. The probability of an inadvertent actuation is extremely small due to the matrix logic employed for circulator trip and valve actuation. The SLRDIS panels are referred to as "loops"; however, due to the way the outputs of the panels are combined to provide protective action and satisfy the single failure concept, the SLRDIS loops do not correspond to primary or secondary loops.

Basis for Specification LCO 4.4.1 (Continued)

For each SLRDIS loop, the OPERABILITY requirements and their respective ACTIONs represent good operating practices and judgment for a four channel detection system with a 2 of 4 coincidence trip logic. The fourth channel may be placed in bypass for test and/or maintenance purposes, subject to the ACTION statement restrictions, while preserving a 2 of 3 coincidence logic OPERABLE. The Steam Line Rupture Detection/Isolation System as designed and installed has spare channels available for input. Any of the available channels may be selected for input signal processing provided the surveillances are current on the channels used. The SLRDIS is required to be OPERABLE only at power (above 2% rated thermal power). Analyses with rated reactor power at 2% demonstrate that automatic actuation of SLRDIS is not likely to occur during a high energy line break lasting until it is manually terminated at one hour following initiation. The temperatures as analyzed in both the reactor and turbine buildings stay well below the temperature for which the equipment is qualified.

The ACTION statements for inoperable SLRDIS detection and information processing equipment allow one channel in each building to be inoperable for up to 7 days; a second inoperable channel in either building requires that power be reduced to below 2% within 12 hours. The 7 day ACTION time for a single detector channel is acceptable based on preservation of a 2 out of 3 coincidence detection system still in operation. ACTION 3 is applicable to other functions within the SLRDIS instrumentation panel such as loss of power from instrument buses, or other failures in the logic trains and associated electronics. A 12 hour time period in ACTION 3 for inoperability of those associated SLRDIS functions minimized the time that SLRDIS may operate with limited functional capability. An inoperable valve or associated equipment is allowed for 72 hours. High energy line break analysis for environmental qualification assumes the worst-case single active failure. Thus, a single valve inoperable for up to 72 hours is within the bounds of analysis. When two or more valves and/or associated equipment is inoperable, 24 hours is allowed to restore the inoperable equipment. Repairs may be performed while the plant is at power, thus, minimizing thermal cycling of plant and installed equipment.

Steam Leak Detection in the Turbine Building is required for equipment qualification of Safe Shutdown Cooling Systems. Thus, the limits and basis are the same as discussed in the basis for steam leak detection in the reactor building.

Basis for Specification LCO 4.4.1 (Continued)

d. Rod Withdrawal Prohibit Inputs

The termination of control rod withdrawal to prevent further reactivity addition will occur with the following conditions:

Startup Channel - Low Count Rate

Start-up Channel - Low Count Rate is provided to prevent control rod pair withdrawal and reactor startup without adequate neutron flux indication. The trip level is selected to be above the background noise level.

Linear Channel - Low Power RWP

Linear Channel (5% Power) directs the reactor operator's attention to either a downscale failure of a power range channel or improper positioning of the Interlock Sequence Switch. (FSAR Sections 7.1.2.2 and 7.1.2.8)

Linear Channel - High Power RWP

Linear Channel (30% Power) is provided to prevent control rod pair withdrawal if reactor power exceeds the Interlock Sequence Switch limit for the "Low Power" position. (FSAR Sections 7.1.2.2 and 7.1.2.8)