1.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

1.3 Limiting Safety System Settings, Reactor Protective System

Applicability

This specification applies to RPS Limiting Safety System settings and bypasses for instrument channels.

Objective

To provide for automatic protection action in the event that the principal process variables approach a safety limit.

Specification

The reactor protective system trip setting limits and the permissible bypasses for the instrument channels shall be within the Limiting Safety System Setting as stated in Table 1-1.

Basis

The reactor protective system consists of four instrument channels to monitor selected plant conditions which will cause a reactor trip if any of these conditions deviate from a preselected operating range to the degree that a safety limit may be reached.

(1) High Power Level - A reactor trip at high power level (neutron flux) is provided to prevent damage to the fuel cladding resulting from some reactivity excursions too rapid to be detected by pressure and temperature measurements (in addition, thermal signals are provided to the high power level trip unit as a backup to the neutron flux signal).

During normal plant operation, with all reactor coolant pumps operating, reactor trip is initiated when the reactor power level reaches 109.0% of indicated full power. Adding to this the possible variation in trip point due to calibration and measurement errors, the maximum actual steady-state power at which a trip would be actuated is 112%, which was used for the purpose of safety analysis.[1]

During reactor operation at power levels between 19.1% and 100% of rated power, the Variable High Power Trip (VHPT) will initiate a reactor trip in the event of a reactivity excursion that increases reactor power by 10% or less of rated power. The high power trip setpoint can be set no more than 10% of rated power above the indicated plant power. Operator action is required to increase the set point as plant power is increased. The setpoint is automatically decreased as power decreases.

2.0 LIMITING CONDITIONS FOR OPERATION

2.7 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.

Specifications

(1) Minimum Requirements

The reactor shall not be heated up or maintained at temperatures above 300°F unless the following electrical systems are operable:

a. Unit auxiliary power transformers T1A-1 or -2 (4,160 V).

b. House service transformers T1A-3 and 4 (4,160 V).

c. 4,160 V engineered safety feature buses 1A3 and 1A4.

d. 4,160 V/480 V Transformers T1B-3A, T1B-3B, T1B-3C, T1B-4A, T1B-4B, T1B-4C.

e. 480 V distribution buses 1B3A, 1B3A-4A, 1B4A, 1B3B, 1B3B-4B, 1B4B, 1B3C, 1B3C-4C, 1B4C.

f. MCC No. 3A1, 3B1, 3A2, 3C1, 3C2, 4A1, 4A2, 4C1 and 4C2.

g. 125 V d-c buses No. 1 and 2 (Panels EE-8F and EE-8G).

h. 125 V d-c distribution panels AI-41A and AI-41B.

i. 120V a-c instrument buses A, B, C, and D (Panels AI-40-A, B, C and D).

j. Inverters A, B, C, and D.

k. Station batteries No. 1 and 2 (EE-8A and EE-8B) including one battery charger on each 125V d-c bus No. 1 and 2 (EE-8F and EE-8G).

l. Two emergency diesel generators (DG-1 and DG-2).

m. One diesel fuel oil storage system containing a minimum volume of 16,000 gallons of diesel fuel in FO-1, and a minimum volume of 10,000 gallons of diesel fuel in FO-10.

plant shutdown as required by Specification 2.7(2). This period is acceptable based on the remaining capacity (more than 6 days), the fact that procedures are in place to obtain replenishment, and the low probability of an event during this brief period.

Additional supplies of diesel fuel oil are available in the Omaha area and from nearby terminals. Ample facilities exist to assure deliveries to the site within 24 hours.

One battery charger on each battery shall be operating so that the batteries will always be at full charge; this ensures that adequate d-c power will be available for all emergency uses. Each battery has one battery charger permanently connected with a third charger capable of being connected to either battery bus. The chargers are each rated for 400 amperes at 130 volts. Following a DBA the batteries and the chargers will handle all required loads. Each of the reactor protective channels instrumentation channels is supplied by one of the safety-related a-c instrument buses. The removal of one of the safety-related a-c instrument buses is permitted as the 2-of-4 logic may be manually changed to a 2-of-3 logic without compromising safety.

The engineered safeguards instrument channels use safety-related a-c instrument buses (one redundant bus for each channel) and d-c buses (one redundant bus for each logic circuit). The removal of one of the safety-related a-c instrument buses is permitted as the two of four logic automatically becomes a two of three logic.

Required engineered safeguards components, as described in Specification 2.7(2), refers to components required to be operable by other Limiting Conditions for Operation within these Technical Specifications. If no other LCO requires a particular ESF component to be operable, then its redundant component is also not required to be operable due to this specification. As an example, Specification 2.3 requires that safety injection pumps be operable prior to the reactor being made critical, and Specification 2.7 applies when the RCS is above 300°F. If the RCS is above 300°F but the reactor is not critical, then no safety injection pumps are required to be operable.

References

(1) USAR, Section 8.3.1.2
(2) USAR, Section 8.4.1
(3) USAR, Section 8.2.2

3.0 SURVEILLANCE REQUIREMENTS

3.0.1 Each surveillance requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

3.0.2 The surveillance intervals are defined as follows:

Notation	Title	Frequency
S	Shift	At least once per 12 hours
D	Daily	At least once per 24 hours
W	Weekly	At least once per 7 days
BW	Biweekly	At least once per 14 days
M	Monthly	At least once per 31 days
Q	Quarterly	At least once per 92 days
SA	Semiannual	At least once per 184 days
A	Annually	At least once per 366 days
R	Refueling	At least once per 18 months
P	Start up	Prior to Reactor Start up, if not completed in the previous week.

Exception to these intervals are stated in the individual Specifications.

3.0.3 The provisions of Specifications 3.0.1 and 3.0.2 are applicable to all codes and standards referenced within the Technical Specifications. The requirements of the Technical Specifications shall have precedence over the requirements of the codes and standards referenced within the Technical Specifications.

3.0.4 Failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Specifications 3.0.1 and 3.0.2, shall constitute noncompliance with the OPERABILITY requirements for the corresponding Limiting Condition for Operation. The time limits of the ACTION requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. The ACTION requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowable outage time limits of the ACTION requirements are less than 24 hours. Surveillance Requirements do not have to be performed on inoperable equipment.

TABLE 3-5 (Continued)

		Test	Frequency	USAR Section Reference
10c.	(continued)	4. Automatic and/or manual initiation of the system shall be demonstrated.	R	
11.	Containment Ventilation System Fusible Linked Dampers	1. Demonstrate damper action. 2. Test a spare fusible link.	1 year, 2 years, 5 years, and every 5 years thereafter.	9.10
12.	Diesel Generator Under-Voltage Relays	Calibrate	R	8.4.3
13.	Motor Operated Safety Injection Loop Valve Motor Starters (HCV-311, 314, 317, 320, 327, 329, 331, 333, 312, 315, 318, 321)	Verify the contactor pickup value at ≤85% of 460 V.	R	
14.	Pressurizer Heaters	Verify control circuits operation for post-accident heater use.	R	
15.	Spent Fuel Pool Racks	Test neutron poison samples for dimensional change, weight, neutron attenuation change and specific gravity change.	1, 2, 4, 7, and 10 years after installation, and every 5 years thereafter.	
16.	Reactor Coolant Gas Vent System	1. Verify all manual isolation valves in each vent path are in the open position.	During each refueling outage just prior to plant start-up.	
		2. Cycle each automatic valve in the vent path through at least one complete cycle of full travel from the control room. Verification of valve cycling may be determined by observation of position indicating lights.	R	
		3. Verify flow through the reactor coolant vent system vent paths.	R	

3.0 SURVEILLANCE REQUIREMENTS

3.5 Containment Test

Applicability

Applies to containment leakage and structural integrity.

Objective

To verify that the:

(1) Locked closed manual containment isolation valves are closed and locked,
(2) potential leakage from containment is within acceptable limits, and
(3) structural performance of all important components in the containment prestressing system is acceptable.

Specifications

(1) Prior to the reactor going critical after a refueling outage, and at least once per 31 days thereafter, an administrative check will be made to confirm that all "locked closed" manual containment isolation valves, except for valves that are open under administrative control as permitted by Specification 2.6(1)a, are closed and locked. Valves, blind flanges, and deactivated automatic valves which are located inside the containment and are locked, sealed or otherwise secured in the closed position shall be verified closed during each cold shutdown except that such verification need not be performed more often than once per 92 days.

(2) Containment Integrated Leakage Rate Test (Type A Tests)

Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program.

(3) Containment Penetrations Leak Rate Tests (Type B Tests)

Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program for the following penetrations:

(i) Equipment Hatch
(ii) Personnel Air Lock
(iii) Mechanical Penetrations M-1 through M-99
(iv) Fuel Transfer Tube (Mechanical Penetration M-100)
(v) Electrical Penetrations:

A-1	B-9	D-6	F-2	E-HCV-383-3A
A-2	B-10	D-7	F-4	E-HCV-383-3B
A-4	B-11	D-8	F-5	E-HCV-383-4A
A-5	C-1	D-9	F-6	E-HCV-383-4B
A-6	C-2	D-10	F-7	
A-7	C-4	D-11	F-8	
A-8	C-5	E-1	F-9	
A-9	C-6	E-2	F-10	