16.1 Technical Specifications

16.1.1 Introduction to Technical Specifications

LCO Selection Criteria

The NRC Final Policy Statement on Technical Specification Improvement (July 1993) criteria stated below has been used to identify the structures, systems, and parameters for which Limiting Conditions for Operation (LCOs) have been included in the AP600 Technical Specifications.

1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

2. A process variable, design feature, or operating restriction that is an initial condition of a Design Basis Accident or Transient Analyses that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

3. A structure, system or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

4. Structures, systems, and components which operating experience or probabilistic safety assessment has shown to be important to public health and safety.

Technical Specification Content

The content of the AP600 Technical Specifications meets the 10CFR50.36 requirements and is consistent with the Technical Specification Improvement Program, NUREG 1431, to the maximum extent possible. The content of Section 1.0, Use and Application and Section 3.0, Applicability is the same as NUREG 1431. The content of Section 2.0, Safety Limits, and of Sections 3.1 through 3.9 differs from NUREG 1431 only as necessary to reflect technical differences between the "typical" Westinghouse design and the AP600 design.

<u>Completion Times and Surveillance Frequencies</u>

The Completion Times and Surveillance Frequencies specified in NUREG 1431 have been applied to similar Actions and Surveillances Requirements in AP600. Refer to Westinghouse letter DCP/NRC0891 for a discussion regarding selection of Completion Times and Surveillance Frequencies for those AP600 Tech Specs for which no comparable NUREG 1431 system/function exists and for those AP600 system design differences which lead to deviations from NUREG 1431 Completion Times and Surveillance Frequencies.

Shutdown Completion Times/Mode Definitions

The AP600 plant design is different from current Westinghouse designs in that the systems normally used for MODE reduction are non-safety systems; and therefore, are not covered by LCO requirements in Technical Specifications. The passive safety systems, which shut down the plant require a longer period of time to accomplish mode changes and can not reduce the RCS temperature to below 200°F.

LCO and Bases "TBD" Information

In cases where the detailed design, equipment selection, or other efforts are not sufficiently complete to establish the information required to be specified in Technical Specifications, "[TBD]" (to be determined) has been specified. Additionally, some of the information, such as that established by startup testing, will not be available until a plant is constructed.

Combined License Information

This set of technical specifications is intended to be used as a guide in the development of the plant-specific technical specifications. Combined License applicants referencing the AP600 will replace preliminary information provided in brackets [ ] with final plant specific values.

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1.0 USE AND APPLICATION

1.1 Definitions

-----------------------------------NOTE-----------------------------------
The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
ACTUATION DEVICE TEST	An ACTUATION DEVICE TEST is a test of the actuated equipment. This test may consist of verification of actual operation but shall, at a minimum, consist of a continuity check of the associated actuated devices. The ACTUATION DEVICE TEST shall be conducted such that it provides component overlap with the ACTUATION LOGIC TEST.
ACTUATION LOGIC TEST	An ACTUATION LOGIC TEST shall be the application of various simulated or actual input combinations in conjunction with each possible interlock logic state and the verification of the required logic output. The ACTUATION LOGIC TEST shall be conducted such that it provides component overlap with the ACTUATION DEVICE TEST.
AXIAL FLUX DIFFERENCE (AFD)	AFD shall be the difference in normalized flux signals between the top and bottom halves of a two-section excore neutron detector.
CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel so that it responds within the required range and accuracy to known input. The CHANNEL CALIBRATION shall encompass the entire channel, including the required sensor, alarm,

(continued)

1.1 Definitions

CHANNEL CALIBRATION (continued)	interlock, display, and trip functions. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION shall include an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping calibrations or total channel steps so that the entire channel is calibrated.
CHANNEL CHECK	A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.
CHANNEL OPERATIONAL TEST (COT)	A COT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify the OPERABILITY of required alarm, interlock, display, and trip functions. The COT shall include adjustment as necessary, of the required alarm, interlock, and trip setpoints so that the setpoints are within the required range and accuracy.
CORE ALTERATION	CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

(continued)

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these parameter limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP Publication 30, "Limits for Intake of Radionuclides by Workers," 1978-1981.
DOSE EQUIVALENT XE-133	DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (microcuries per gram) that alone would produce the same deep-dose equivalent as the quantity and isotopic mixture of noble gases (Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, Xe-133m, Xe-133, Xe-135, and Xe-138) actually present. The dose conversion factors used for this calculation shall be those listed in Table 2.3 of EPA Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," EPA-520/1-88-020, September 1988.
ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions). The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

(continued)

1.1 Definitions (continued)

L_a — The maximum allowable primary containment leakage rate, L_a, shall be [0.10]% of primary containment air weight per day at the calculated peak containment pressure (P_a).

LEAKAGE — LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE, such as that from seals or valve packing, that is captured and conducted to collection systems or a sump or collecting tank;

2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE;

3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System; or

4. RCS LEAKAGE through the passive residual heat removal heat exchanger (PRHR HX) to the In-containment Refueling Water Storage Tank (IRWST).

b. Unidentified LEAKAGE

All LEAKAGE that is not identified LEAKAGE.

c. Pressure Boundary LEAKAGE

LEAKAGE (except SG LEAKAGE and PRHR HX tube LEAKAGE) through a nonisolatable fault in a RCS component body, pipe wall, or vessel wall.

MODE — A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

(continued)

1.1 Definitions (continued)

OPERABLE-OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits" and LCO 3.4.15, "Low Temperature Overpressure Protection (LTOP) System."

(continued)

1.1 Definitions (continued)

QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 1933 MWt.
REACTOR TRIP CHANNEL OPERATIONAL TEST (RTCOT)	A RTCOT shall be the injection of a simulated or actual signal into the RT (Reactor Trip) CHANNEL as close to the sensor as practicable to verify OPERABILITY of the required interlock and/or trip functions. The REACTOR TRIP CHANNEL OPERATIONAL TEST may be performed by means of a series of sequential, overlapping, or total channel steps so that the entire channel is tested from the signal conditioner through the dynamic trip bus.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All rod cluster control assemblies (RCCAs) and assemblies (GRAs) are fully inserted except for the single assembly of highest reactivity worth, which is assumed to be fully withdrawn. With any rod assembly(s) not capable of being fully inserted, the reactivity worth of these assemblies must be accounted for in the determination of SDM; and

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the nominal zero power design level.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during n Surveillance Frequency intervals, where n is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT)	A TADOT shall consist of operating the trip actuating device and verifying the OPERABILITY of required alarm, interlock, display, and trip functions. The TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the required accuracy.

Table 1.1-1 (page 1 of 1)
MODES

MODES	TITLE	REACTIVITY CONDITION (K_{eff})	% RATED THERMAL POWER[a]	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	≥ 0.99	> 5	NA
2	Startup	≥ 0.99	≤ 5	NA
3	Hot Standby	< 0.99	NA	> 420
4	Safe Shutdown[b]	< 0.99	NA	$420 \geq T_{avg} > 200$
5	Cold Shutdown[b]	< 0.99	NA	≤ 200
6	Refueling[c]	NA	NA	NA

(a) Excluding decay heat.

(b) All reactor vessel head closure bolts fully tensioned.

(c) One or more reactor vessel head closure bolts less than fully tensioned.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in Technical Specifications are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meaning.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES

The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify ... AND A.2 Restore...	

In this example, the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

(continued)

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Trip..	
	OR	
	A.2.1 Verify...	
	AND	
	A.2.2.1 Reduce..	
	OR	
	A.2.2.2 Perform..	
	OR	
	A.3 Align...	

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Actions may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE

The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.

BACKGROUND

Limiting Conditions for Operation (LCOs) specify minimum requirements for ensuring safe operation of the unit. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s).

DESCRIPTION

The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., inoperable equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the unit is in a MODE or specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the unit is not within the LCO Applicability.

If situations are discovered that require entry into more than one Condition at a time within a single LCO (multiple Conditions), the Required Actions for each Condition must be performed within the associated Completion Time. When in multiple Conditions, separate Completion Times are tracked for each Condition starting from the time of discovery of the situation that required entry into the Condition.

Once a Condition has been entered, subsequent trains, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition, unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.

(continued)

1.3 Completion Times

DESCRIPTION (continued)

However, when a subsequent train, subsystem, component, or variable, expressed in the Condition, is discovered to be inoperable or not within limits, the Completion Time(s) may be extended. To apply this Completion Time extension, two criteria must first be met. The subsequent inoperability:

a. Must exist concurrent with the first inoperability; and

b. Must remain inoperable or not within limits after the first inoperability is resolved.

The total Completion Time allowed for completing a Required Action to address the subsequent inoperability shall be limited to the more restrictive of either:

a. The stated Completion Time, as measured from the initial entry into the Condition, plus an additional 24 hours; or

b. The stated Completion Time as measured from discovery of the subsequent inoperability.

The above Completion Time extensions do not apply to those Specifications that have exceptions that allow completely separate re-entry into the Condition (for each train, subsystem, component, or variable expressed in the Condition) and separate tracking of Completion Times based on this re-entry. These exceptions are stated in individual Specifications.

The above Completion Time extension does not apply to a Completion Time with a modified "time zero." This modified "time zero" may be expressed as a repetitive time (i.e., "once per 8 hours," where the Completion Time is referenced from a previous completion of the Required Action versus the time of Condition entry) or as a time modified by the phrase "from discovery ...." Example 1.3-3 illustrates one use of this type of Completion Time. The 10 day Completion Time specified for Conditions A and B in example 1.3-3 may not be extended.

(continued)

1.3 Completion Times (continued)

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

Condition B has two Required Actions. Each Required Action has its own separate Completion Time. Each Completion Time is referenced to the time that Condition B is entered.

The Required Actions of Condition B are to be in MODE 3 within 6 hours AND in MODE 5 in 36 hours. A total of 6 hours is allowed for reaching MODE 3 and a total of 36 hours (not 42 hours) is allowed for reaching MODE 5 from the time that Condition B was entered. If MODE 3 is reached within 3 hours, the time allowed for reaching MODE 5 is the next 33 hours because the total time allowed for reaching MODE 5 is 36 hours.

If Condition B is entered while in MODE 3, the time allowed for reaching MODE 5 is the next 36 hours.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One valve inoperable.	A.1 Restore valve to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

When a valve is declared inoperable, Condition A is entered. If the valve is not restored to OPERABLE status within 7 days, Condition B is also entered and the Completion time clocks for Required Actions B.1 and B.2 start. If the inoperable valve is restored to OPERABLE status after Condition B is entered, Condition A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

When a second valve is declared inoperable while the first valve is still inoperable, Condition A is not re-entered for the second valve. LCO 3.0.3 is entered, since the ACTIONS do not include a Condition for more than one inoperable valve. The Completion Time clock for Condition A does not stop after LCO 3.0.3 is entered, but continues to be tracked from the time Condition A was initially entered.

While in LCO 3.0.3, if one of the inoperable valves is restored to OPERABLE status and the Completion Time for Condition A has not expired, LCO 3.0.3 may be exited and operation continued in accordance with Condition A.

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-2 (continued)

While in LCO 3.0.3, if one of the inoperable valves is restored to OPERABLE status and the Completion Time for Condition A has expired, LCO 3.0.3 may be exited and operation continued in accordance with Condition B. The Completion Time for Condition B is tracked from the time the Condition A Completion Time expired.

On restoring one of the valves to OPERABLE status the Condition A Completion Time is not reset, but continues from the time the first valves was declared inoperable. This Completion Time may be extended if the valve restored to OPERABLE status was the first inoperable valve. A 24 hour extension to the stated 7 days is allowed, provided this does not result in the second valve being inoperable for > 7 days.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Function X train inoperable.	A.1 Restore Function X train to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B. One Function Y train inoperable.	B.1 Restore Function Y train to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet the LCO
C. One Function X train inoperable. AND One Function Y train inoperable.	C.1 Restore Function X train to OPERABLE status. OR C.2 Restore Function Y train to OPERABLE status.	72 hours 72 hours

When one Function X train and one Function Y train are inoperable, Condition A and Condition B are concurrently applicable. The Completion Times for Condition A and

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-3 (continued)

Condition B are tracked separately for each train starting from the time each train was declared inoperable and the Condition was entered. A separate Completion Time is established for Condition C and tracked from the time the second train was declared inoperable (i.e., the time the situation described in Condition C was discovered).

If Required Action C.2 is completed within the specified Completion Time, Conditions B and C are exited. If the Completion Time for Required Action A.1 has not expired, operation may continue in accordance with Condition A. The remaining Completion Time in Condition A is measured from the time the affected train was declared inoperable (i.e., initial entry into Condition A).

The Completion Times of Conditions A and B are modified by a logical connector with a separate 10 day Completion Time measured from the time it was discovered the LCO was not met. In this example, without the separate Completion Time, it would be possible to alternate between Conditions A, B, and C in such a manner that operation could continue indefinitely without ever restoring systems to meet the LCO. The separate Completion Time modified by the phrase "from discovery of failure to meet the LCO" is designed to prevent indefinite continued operation while not meeting the LCO. This Completion Time allows for an exception to the normal "time zero" for beginning the Completion Time "clock". In this instance, the Completion Time "time zero" is specified as commencing at the time the LCO was initially not met, instead of at the time the associated Condition was entered.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more valves inoperable.	A.1 Restore valve(s) to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

A single Completion Time is used for any number of valves inoperable at the same time. The Completion Time associated with Condition A is based on the initial entry into Condition A and is not tracked on a per valve basis. Declaring subsequent valves inoperable, while Condition A is still in effect, does not trigger the tracking of separate Completion Times.

Once one of the valves has been restored to OPERABLE status, the Condition A Completion Time is not reset, but continues from the time the first valve was declared inoperable. The Completion Time may be extended if the valve restored to OPERABLE status was the first inoperable valve. The Condition A Completion Time may be extended for up to 4 hours provided this does not result in any subsequent valve being inoperable for > 4 hours. If the Completion Time of 4 hours (including the extension) expires while one or more valves are still inoperable, Condition B is entered.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-5

ACTIONS

-------------------------NOTE-------------------------
Separate Condition entry is allowed for each inoperable valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more valves inoperable.	A.1 Restore valve to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

The Note above the ACTIONS Table is a method of modifying how the Completion Time is tracked. If this method of modifying how the Completion Time is tracked was only applicable to a specific Condition, the Note would appear in that Condition rather than at the top of the ACTIONS Table.

The Note allows Condition A to be entered separately for each inoperable valve, and Completion Times tracked on a per valve basis. When a valve is declared inoperable, Condition A is entered and its Completion Time starts. If subsequent valves are declared inoperable, Condition A is entered for each valve and separate Completion Times start and are tracked for each valve.

If the Completion Time associated with a valve in Condition A expires, Condition B is entered for that valve. If the Completion Times associated with subsequent valves in

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-5 (continued)

Condition A expire, Condition B is entered separately for each valve and separate Completion Times start and are tracked for each valve. If a valve which caused entry into Condition B is restored to OPERABLE status, Condition B is exited for that valve. Since the Note in this example allows multiple Condition entry and tracking of separate Completion Times, Completion Time extensions do not apply.

EXAMPLE 1.3-6

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Perform SR 3.x.x.x.	Once per 8 hours
	OR	
	A.2 Reduce THERMAL POWER to $\leq$ 50% RTP.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

Entry into Condition A offers a choice between Required Action A.1 or A.2. Required Action A.1 has a "once per" Completion Time, which qualifies for the 25% extension, per SR 3.0.2, to each performance after the initial performance. The initial 8 hours interval of Required Action A.1 begins when Condition A is entered and the initial performance of Required

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-6 (continued)

Action A.1 must be complete within the first 8 hour interval. If Required Action A.1 is followed, and the Required Action is not met within the Completion Time (plus the extension allowed by SR 3.0.2), Condition B is entered. If Required Action A.2 is followed and the Completion Time of 8 hours is not met, Condition B is entered.

EXAMPLE 1.3-7

If after entry into Condition B, Required Action A.1 or A.2 is met, Condition B is exited and operation may then continue in Condition A.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Verify affected subsystem isolated. AND A.2 Restore subsystem to OPERABLE status.	1 hour AND Once per 8 hours thereafter 72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7 (continued)

Required Action A.1 has two Completion Times. The 1 hour Completion Time begins at the time the Condition is entered and each "Once per 8 hours thereafter" interval begins upon performance of Required Action A.1.

If after Condition A is entered, Required Action A.1 is not met within either the initial 1 hour, or any subsequent 8 hour interval from the previous performance (plus the extension allowed by SR 3.0.2), Condition B is entered. The Completion Time clock for Condition A does not stop after Condition B is entered, but continues from the time Condition A was initially entered. If Required Action A.1 is met after Condition B is entered, Condition B is exited and operation may continue in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.

IMMEDIATE COMPLETION TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE

The purpose of this section is to define the proper use and application of Frequency requirements.

DESCRIPTION

Each Surveillance Requirement (SR) has a specified Frequency in which the surveillance must be met in order to meet the associated LCO. An understanding of the correct application of the specified Frequency is necessary for compliance with the SR.

The "specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Surveillance Requirement (SR) Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each SR as well as certain Notes in the Surveillance column that modify performance requirements.

Situations where a Surveillance could be required (i.e., its Frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated LCO is within its Applicability, represent potential SR 3.0.4 conflicts. To avoid these conflicts, the SR (i.e., the Surveillance or the Frequency) is stated such that it is only "required" when it can be and should be performed. With an SR satisfied, SR 3.0.4 imposes no restriction.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified. In these examples, the Applicability of the LCO (LCO not shown) is MODES 1, 2, and 3.

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENT

SURVEILLANCE	FREQUENCY
Perform CHANNEL CHECK.	12 hours

(continued)

1.4 Frequency

EXAMPLES

EXAMPLE 1.4-1 (continued)

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated surveillance must be performed at least one time. Performance of the surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the stated Frequency is allowed by SR 3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR in not required to be met per SR 3.0.1 (such as when the equipment is inoperable, a variable is outside the specified limits, or the Unit is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the unit is in a MODE or other specified condition in the Applicability of the LCO, and the performance of the Surveillance is otherwise modified (refer to Example 1.4-3), then SR 3.0.3 becomes applicable.

If the interval specified by SR 3.0.2 is exceeded while the unit is not in a MODE or other specified condition in the Applicability of the LCO for which performance of the SR is required, the Surveillance must be performed within the Frequency requirements of SR 3.0.2 prior to entry into the MODE or other specified condition. Failure to do so would result in a violation of SR 3.0.4.

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours after $\geq$ 25% RTP AND 24 hours thereafter

(continued)

1.4 Frequency

EXAMPLES

EXAMPLE 1.4-2 (continued)

Example 1.4-2 has two Frequencies. The first is a one time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" requires that both Frequency requirements be met. Each time the reactor power is increased from a power level < 25% RTP to ≥ 25% RTP, the surveillance must be performed within 12 hours.

The use of "Once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND"). This type of Frequency does not qualify for the 25% extension allowed by SR 3.0.2. "Thereafter" indicates future performances must be established per SR 3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example). If reactor power decreases to < 25% RTP, the measurement of both intervals stops. New intervals start upon reactor power reaching 25% RTP.

EXAMPLE 1.4-3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
----------------NOTE---------------- Not required to be performed until 12 hours after ≥ 25% RTP. ---------------------------------------	
Perform channel adjustment.	7 days

The interval continues, whether or not the unit operation is < 25% RTP between performances.

As the Note modifies the required performance of the Surveillance, it is construed to be part of the "specified Frequency." Should the 7 day interval be exceeded while operation is < 25% RTP, this Note allows 12 hours after power reaches ≥ 25% RTP to perform the Surveillance. The Surveillance is still considered to be performed within

(continued)

1.4 Frequency

EXAMPLES

<u>EXAMPLE 1.4-3</u> (continued)

the "specified Frequency." Therefore, if the Surveillance were not performed within the 7 day (plus the extension allowed by SR 3.0.2) interval, but operation was < 25% RTP, it would not constitute a failure of the SR or failure to meet the LCO. Also, no violation of SR 3.0.4 occurs when changing MODES, even with the 7 day Frequency not met, provided operation does not exceed 12 hours with power ≥ 25% RTP.

Once the unit reaches 25% RTP, 12 hours would be allowed for completing the Surveillance. If the Surveillance were not performed within this 12 hour interval, there would then be a failure to perform a Surveillance within the specified Frequency, and the provisions of SR 3.0.3 would apply.

2.0 SAFETY LIMITS

2.1 SLs

2.1.1 Reactor Core SLs

In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) highest loop average temperature, and pressurizer pressure shall not exceed the SLs specified in Figure 2.1.1-1.

2.1.2 RCS Pressure SL

In MODES 1, 2, 3, 4, and 5 the RCS pressure shall be maintained $\leq$ 2733.5 psig.

2.2 SL Violations

2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 3 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

2.2.2.1 In MODE 1 or 2, restore compliance and be in MODE 3 within 1 hour.

2.2.2.2 In MODE 3, 4, or 5, restore compliance within 5 minutes.

2.2.3 Within 1 hour, notify the NRC Operations Center, in accordance with 10 CFR 50.72.

2.2.4 Within 24 hours, notify the [Plant Manager and a specified corporate executive.]

2.2.5 Within 30 days a Licensee Event Report (LER) shall be prepared pursuant to 10 CFR 50.73. The LER shall be submitted to the NRC and the [Plant Manager and a specified corporate executive].

2.2.6 Operation of the Unit shall not be resumed until authorized by the NRC.

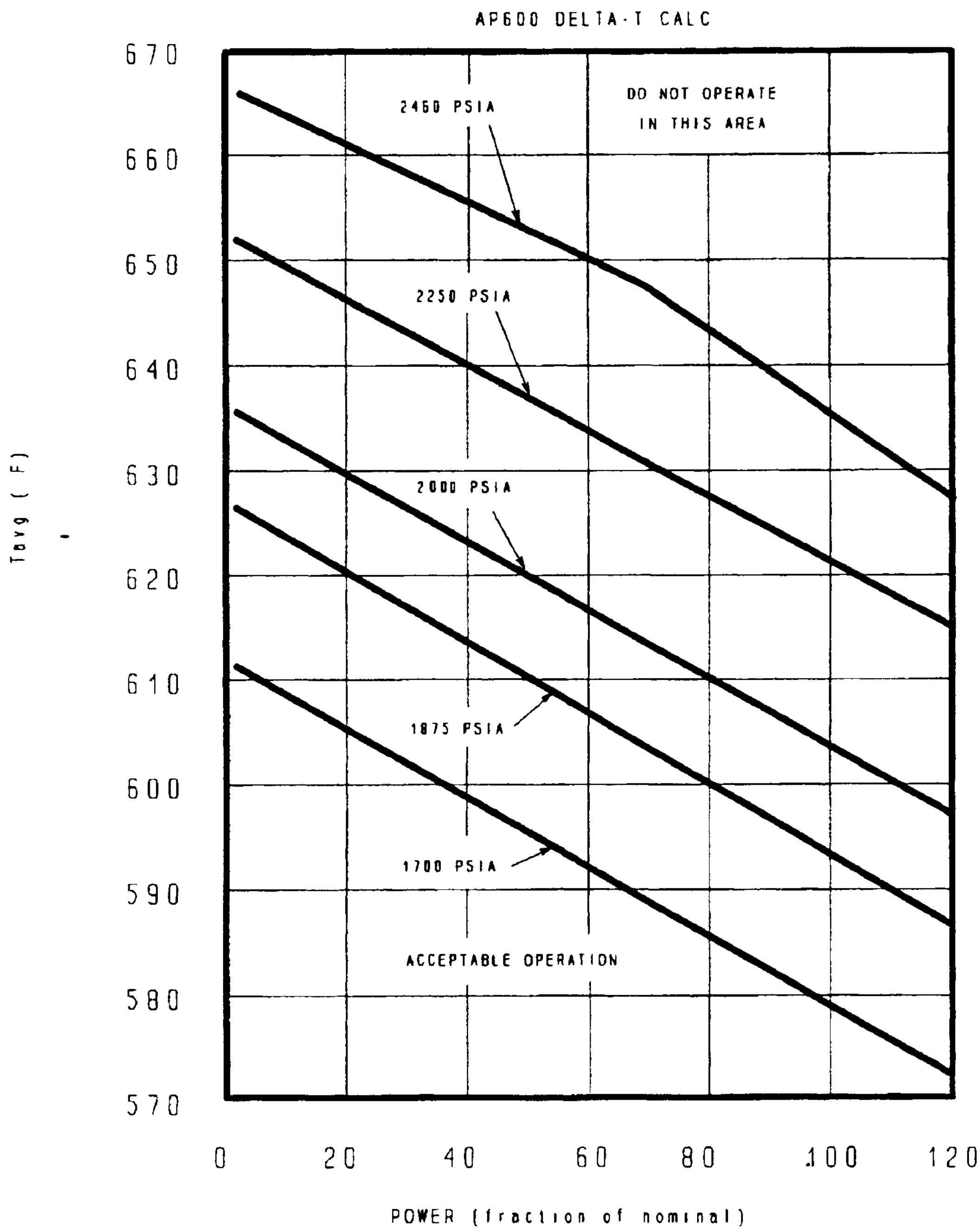

Figure 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits

3.0 LIMITING CONDITIONS FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2.

LCO 3.0.2 Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 or 3.0.6.

If the LCO is met, or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

a. MODE 3 within 7 hours; and

b. MODE 4 within 13 hours; and

c. MODE 5 within 37 hours.

Exceptions to this specification are stated in the individual specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required. LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4.

LCO 3.0.4 When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in MODES or other

(continued)

3.0 LCO APPLICABILITY

LCO 3.0.4 (continued)

specified conditions in the Applicability that are required to comply with ACTIONS or are part of a shutdown of the unit.

Exceptions to this specification are stated in the individual Specifications. These exceptions allow entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered allow unit operation in the MODE or other specified condition for only a limited period of time.

LCO 3.0.4 is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4.

LCO 3.0.5

Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the test required to demonstrate OPERABILITY.

LCO 3.0.6

When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered. This is an exception to LCO 3.0.2 for the supported system. In this event, additional evaluations and limitations may be required in accordance with Specification 5.5.8, "Safety Function Determination Program (SFDP)." If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

When a support system's Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions shall be entered in accordance with LCO 3.0.2.

(continued)

3.0 LCO APPLICABILITY (continued)

LCO 3.0.7

Test Exception LCO 3.1.8 allows specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with Test Exception LCOs is optional. When a Test Exception LCO is desired to be met but is not met, the ACTIONS of the Test Exception LCO shall be met. When a Test Exception LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall be made in accordance with the other applicable Specifications.

LCO 3.0.8

When an LCO is not met and the associated ACTIONS are not met or an associated ACTION is not provided, action shall be initiated within 1 hour to:

a. Restore inoperable equipment and

b. Monitor Safety System Shutdown Monitoring Trees parameters

Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.8 is not required.

LCO 3.0.8 is only applicable in MODES 5 and 6.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1

SRs shall be met during the MODES or other specified Conditions in the Applicability of individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the surveillance or between performances of the Surveillance, shall be a failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on inoperable equipment or variables outside specified limits.

SR 3.0.2

The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

For Frequencies specified as "once", the above interval extension does not apply.

If a Completion Time requires periodic performance on a "once per..." basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3

If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, which ever is less. This delay period is permitted to allow performance of the Surveillance.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Conditions must be entered.

When the Surveillance is performed within the delay period, and the Surveillance is not met, the LCO must immediately be declared not met, and the Applicable Condition(s) must be entered.

(continued)

3.0 SR APPLICABILITY (continued)

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability of a LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

SR 3.0.4 is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 The SDM shall be $\geq$ 1.6% $\Delta k/k$.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$,
MODES 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM is $\geq$ 1.6% $\Delta k/k$.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 Core Reactivity

LCO 3.1.2 The measured core reactivity shall be within $\pm 1\%$ $\Delta k/k$ of the normalized predicted values.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Measured core reactivity not within limit.	A.1 Re-evaluate core design and safety analysis and confirm results remain valid for duration of operation under these conditions. <u>AND</u> A.2 Establish appropriate operating restrictions and SRs.	72 hours 72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	-----------------NOTE---------------- The predicted core reactivity shall be normalized to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPDs) after each fuel loading. If the normalized boron letdown curve is higher than the predicted boron letdown curve, then adjust, as appropriate, all relevant operating curves and tables affected by a boron concentration difference from design. ------------------------------------- Verify measured core reactivity is within $\pm 1\%$ $\Delta k/k$ of predicted values.	Once prior to entering MODE 1 after each refueling <u>AND</u> ------NOTE------ Only required after 60 EFPD ---------------- 31 EFPD thereafter

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Moderator Temperature Coefficient (MTC)

LCO 3.1.3 The MTC shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1, and MODE 2 with $k_{eff} \geq 1.0$ for the upper MTC limit, MODES 1, 2, and 3 for the lower MTC limit.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MTC not within upper limit.	A.1 Establish administrative withdrawal limits for control banks to maintain MTC within limit.	24 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2 with $k_{eff} < 1.0$.	6 hours
C. MTC not within lower limit.	C.1 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC within upper limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	Verify MTC is within 300 ppm surveillance limit specified in the COLR.	------NOTE----- Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm -------------- Once each cycle
SR 3.1.3.3	---------------NOTES----------------- 1. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.4.3 shall be repeated once per 7 EFPD during the remainder of the fuel cycle. 2. SR 3.1.4.3 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. ------------------------------------- Verify MTC is within lower limit.	------NOTE----- Not required to be performed until 7 EFPD after reaching the equivalent of an equilibrium RTP-ARO boron concentration of 300 ppm -------------- Once each cycle

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits

LCO 3.1.4 All shutdown and control rods shall be OPERABLE with all individual indicated rod positions within 12 steps of their group step counter demand position.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more rod(s) untrippable.	A.1.1 Verify SDM is $\geq$ 1.6 $\Delta k/k$.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM within limit.	1 hour
	<u>AND</u>	
	A.2 Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One rod not within alignment limits.	B.1 ---------NOTE-------- Maintain bank sequence and insertion limits of LCO 3.1.5 and LCO 3.1.6, with changes to rod position or THERMAL POWER level, during subsequent operation. -------------------- Restore rod, to within alignment limits.	8 hours with the On-Line Power Distribution Monitoring System (OPDMS) OPERABLE <u>OR</u> 1 hour with the OPDMS inoperable
	<u>OR</u>	
	B.2.1.1 Verify SDM $\geq$ 1.6 $\Delta k/k$.	1 hour
	<u>OR</u>	
	B.2.1.2 Initiate boration to restore SDM within limit.	1 hour
	<u>AND</u>	
	B.2.2 Reduce THERMAL POWER to $\leq$ 75% RTP.	2 hours
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2.3 Verify SDM $\geq$ 1.6 $\Delta k/k$. AND ---------NOTE--------- Only required to be performed when OPDMS is inoperable. ----------------------	Once per 12 hours
	B.2.4 Perform SR 3.2.1.1 ($F_Q(Z)$ verification). AND ---------NOTE--------- Only required to be performed when OPDMS is inoperable. ----------------------	72 hours
	B.2.5 Perform SR 3.2.2.1 ($F^N_{\Delta H}$ verification). AND	72 hours
	B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	5 days
C. Required Action and associated Completion Time for Condition B not met.	C.1 Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. More than one rod not within alignment limit.	D.1.1 Verify SDM $\geq$ 1.6 $\Delta k/k$.	1 hour
	OR	
	D.1.2 Initiate boration to restore required SDM to within limit.	1 hour
	AND	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	12 hours AND Once within 4 hours and every 4 hours thereafter when the rod position deviation monitor is inoperable

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core $\geq$ 10 steps in either direction.	92 days
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is $\leq$ 2.4 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500°F$, and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

LCO 3.1.5 Each Shutdown Bank shall be within physical insertion limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with any control bank not fully inserted.

------------------------NOTE------------------------
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limits.	A.1.1 Verify SDM is $\geq$ 1.6% $\Delta k/k$. OR A.1.2 Initiate boration to restore SDM to within limit. AND A.2 Restore shutdown banks to within limits.	1 hour 1 hour 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the limits specified in the COLR.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

LCO 3.1.6 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

------------------------NOTE------------------------
This LCO is not applicable while performing SR 3.1.4.2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control Bank insertion limits not met.	A.1.1 Verify SDM is $\geq$ 1.6% $\Delta k/k$.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2 Restore control bank(s) to within limits.	2 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM is $\geq$ 1.6% $\Delta k/k$.	1 hour
	<u>OR</u>	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	B.2 Restore control bank sequence and overlap to within limits.	2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify the estimated critical control bank position is within limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	12 hours <u>AND</u> Once within 4 hours and every 4 hours thereafter when the rod insertion limit monitor is inoperable.
SR 3.1.6.3	Verify sequence and overlap limits, specified in the COLR, are met for control banks not fully withdrawn from the core.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

LCO 3.1.7 The Digital Rod Position Indication (DRPI) System and the Bank Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

--------------------------------NOTE--------------------------------
Separate Condition entry is allowed for each inoperable rod position indicator per group and each demand position indicator per bank.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators by using the On-line Power Distribution Monitoring System (OPDMS). <u>OR</u> A.2 Reduce THERMAL POWER to ≤ 50% RTP.	Once per 8 hours 8 hours
B. One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position.	B.1 Verify the position of the rods with inoperable position indicators by using the OPDMS. <u>OR</u> B.2 Reduce THERMAL POWER to ≤ 50% RTP.	4 hours 8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One demand position indicator per bank inoperable for one or more banks.	C.1.1 Verify by administrative means all DRPIs for the affected banks are OPERABLE.	Once per 8 hours
	<u>AND</u>	
	C.1.2 Verify the most withdrawn rod and the least withdrawn rod of the affected banks are $\leq$ 12 steps apart.	Once per 8 hours
	<u>OR</u>	
	C.2 Reduce THERMAL POWER to $\leq$ 50% RTP.	8 hours
D. Required Action and associated Completion Times not met.	D.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify each DRPI agrees within 12 steps of the group demand position for the [full indicated range] of rod travel.	24 months

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions – MODE 2

LCO 3.1.8 During the performance of PHYSICS TESTS, the requirements of

LCO 3.1.3 "Moderator Temperature Coefficient,"
LCO 3.1.4 "Rod Group Alignment Limits,"
LCO 3.1.5 "Shutdown Bank Insertion Limit,"
LCO 3.1.6 "Control Bank Insertion Limits," and
LCO 3.4.2 "RCS Minimum Temperature for Criticality"

may be suspended, provided:

a. RCS lowest loop average temperature is ≥ 529°F; and

b. SDM is ≥ 1.6% Δk/k.

APPLICABILITY: MODE 2 during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit. AND A.2 Suspend PHYSICS TEST exceptions.	15 minutes 1 hour
B. THERMAL POWER not within limit	B.1 Open reactor trip breakers.	Immediately
C. RCS lowest loop average temperature not within limit.	C.1 Restore RCS lowest loop average temperature to within limit.	15 minutes

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and Associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.5.	Within 12 hours prior to initiation of PHYSICS TESTS
SR 3.1.8.2	Verify the thermal power and the RCS lowest loop average temperature are within limits.	30 minutes
SR 3.1.8.3	Verify SDM is $\geq$ 1.6% $\Delta k/k$.	24 hours

3.1 REACTIVITY CONTROL

3.1.9 Chemical and Volume Control System (CVS) Demineralized Water Isolation Valves

LCO 3.1.9 Two CVS Demineralized Water Isolation Valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CVS demineralized water isolation valve inoperable.	A.1 Restore two CVS demineralized water isolation valves to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition not met. <u>OR</u> Two CVS demineralized water isolation valves inoperable.	------------NOTE------------ Flow path(s) may be unisolated intermittently under administrative controls. ---------------------------- B.1 Isolate the flow path from the demineralized water storage tank to the Reactor Coolant System by use of at least one closed manual or one closed and de-activated automatic valve.	 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify two CVS demineralized water isolation valves are OPERABLE by stroking the valve closed.	In accordance with the Inservice Testing Program

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor ($F_Q(Z)$) (F_Q Methodology)

LCO 3.2.1 $F_Q(Z)$, as approximated by $F_Q^C(Z)$ and $F_Q^W(Z)$, shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 with On-line Power Distribution Monitoring System (OPDMS) inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. $F_Q^C(Z)$ not within limit.	A.1 Reduce THERMAL POWER $\geq$ 1% RTP for each 1% $F_Q^C(Z)$ exceeds limit.	15 minutes
	<u>AND</u>	
	A.2 Reduce Power Range Neutron Flux High trip setpoints $\geq$ 1% for each 1% $F_Q^C(Z)$ exceeds limit.	8 hours
	<u>AND</u>	
	A.3 Reduce Overpower ΔT trip setpoints $\geq$ 1% for each 1% $F_Q^C(Z)$ exceeds limit.	72 hours
	<u>AND</u>	
	A.4 Perform SR 3.2.1.1.	Prior to increasing THERMAL POWER above the limit of Required Action A.1

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. $F_Q^W(Z)$ not within limits.	B.1 Reduce AFD limits $\geq$ 1% for each 1% $F_Q^W(Z)$ exceeds limit.	2 hours
C. Required Action and associated Completion Times not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

---------------------------------------NOTES---------------------------------------

1. During power escalation at the beginning of each cycle, THERMAL POWER may be increased until a power level for extended operation has been achieved at which a power distribution map is obtained.

2. These SRs are not required to be performed prior to entry into MODE 1.

3. If the OPDMS becomes inoperable while in MODE 1 these surveillances must be performed within 31 days of the last verification of OPDMS parameters.

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_Q^C(Z)$ within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq$ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> 31 EFPD thereafter

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.2.1.2	-----NOTE----- If $F_Q^W(Z)$ is within limits and measurements indicate maximum over z[$F_Q^C(Z)$] has increased since the previous evaluation of $F_Q^C(Z)$: a. Increase $F_Q^W(Z)$ by a factor of [1.02] and reverify $F_Q^W(Z)$ is within limits; or b. SR 3.2.1.2 shall be repeated once per 7 EFPD until 2 successive flux maps indicate maximum over z[$F_Q^C(Z)$] has not increased. ---------- Verify $F_Q^W(Z)$ within limits.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq$ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND 31 EFPD thereafter

3.2 POWER DISTRIBUTION LIMITS

3.2.2 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)

LCO 3.2.2 $F^N_{\Delta H}$ shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 with On-line Power Distribution Monitoring System (OPDMS) inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. -------NOTE-------- Required Actions A.2 and A.3 must be completed whenever Condition A is entered. ------------------		
$F^N_{\Delta H}$ not within limit.	A.1.1 Restore $F^N_{\Delta H}$ to within limit.	4 hours
	<u>OR</u>	
	A.1.2.1 Reduce THERMAL POWER to < 50% RTP.	4 hours
	<u>AND</u>	
	A.1.2.2 Reduce Power Range Neutron Flux - High trip setpoints to ≤ 55% RTP.	8 hours
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Perform SR 3.2.2.1.	24 hours
	<u>AND</u>	
	A.3 ----------NOTE--------- THERMAL POWER does not have to be reduced to comply with this Required Action. ----------------------- Perform SR 3.2.2.1.	Prior to THERMAL POWER exceeding 50% RTP <u>AND</u> Prior to THERMAL POWER exceeding 75% RTP <u>AND</u> 24 hours after THERMAL POWER reaching $\geq$ 95% RTP
B. Required Actions and associated Completion Times not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	----------------NOTE---------------- If the OPDMS becomes inoperable while in MODE 1 these Surveillances must be performed within 31 days of the last verification of OPDMS parameters. ------------------------------------ Verify $F^N_{\Delta H}$ within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> 31 EFPD thereafter

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

LCO 3.2.3 The AFD in %-flux-difference units shall be maintained within the limits specified in the COLR.

-------------------------NOTE-------------------------
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP and with the On-Line Power Distribution Monitoring System (OPDMS) inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Reduce THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel.	7 days AND Once within 1 hour and every 1 hour thereafter with the AFD monitor alarm inoperable

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP and with the OPDMS inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPTR not within limit.	A.1 Reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	2 hours
	AND	
	A.2 Perform SR 3.2.4.1 and reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	Once per 12 hours
	AND	
	A.3 Perform SR 3.2.1.1 and SR 3.2.2.1.	24 hours AND Once per 7 days thereafter
	AND	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	<u>AND</u>	
	A.5 ---------NOTE--------- Perform Required Action A.5 only after Required Action A.4 is completed. --------------------- Calibrate excore detectors to show zero QPTR.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	<u>AND</u>	
	A.6 ---------NOTE-------- Perform Required Action A.6 only after Required Action A.5 is completed. -------------------- Perform SR 3.2.1.1 and SR 3.2.2.1.	Within 24 hours after reaching RTP <u>OR</u> Within 48 hours after increasing THERMAL POWER above the limit of Required Action A.1

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to $\leq$ 50% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	----------------NOTE---------------- With one power range channel inoperable and THERMAL POWER < 75% RTP, the remaining three power range channels can be used for calculating QPTR. ------------------------------------ Verify QPTR within limit by calculation.	7 days AND Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.4.2	-----------------NOTE--------------- Only required to be performed if one power range channel is inoperable with THERMAL POWER ≥ 75% RTP. --------------------------------------- Verify QPTR is within limit using a minimum of 4 symmetric pairs of fixed incore detectors.	Once within 12 hours <u>AND</u> 12 hours thereafter

3.2 POWER DISTRIBUTION LIMITS

3.2.5 OPDMS-Monitored Power Distribution Parameters

LCO 3.2.5 The following parameters shall not exceed their operating limits as specified in the COLR:

a. Peak kw/ft(Z)

b. $F^N_{\Delta H}$

c. DNBR.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP with OPDMS OPERABLE.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more of the parameters a. through c. above not within limits.	A.1 Restore all parameters to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1 ---------NOTE--------- If the power distribution parameters are restored to within their limits while power is being reduced, operation may continue at the power level where this occurs. --------------------- Reduce THERMAL POWER to < 50% RTP.	 4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.5.1	Verify the parameters a. through c. to be within their limits.	24 hours with OPDMS alarms OPERABLE OR 12 hours with OPDMS alarms inoperable

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each inoperable Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately
B. One manual initiation device inoperable.	B.1 Restore manual initiation device to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Open reactor trip breakers (RTBs).	55 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One manual initiation device inoperable.	C.1 Restore manual initiation device to OPERABLE status.	48 hours
	OR	
	C.2 Open RTBs.	49 hours
D. One or two Power Range Neutron Flux-High channels inoperable.	D.1.1 Reduce THERMAL POWER to ≤ 75% RTP.	12 hours
	AND	
	D.1.2 Place inoperable channel(s) in bypass.	6 hours
	OR	
	D.2.1 Place inoperable channel(s) in bypass.	6 hours
	AND	
	-------------NOTE------------- Only required to be performed when OPDMS is inoperable and the Power Range Neutron Flux input to QPTR is inoperable. ------------------------------	
	D.2.2 Perform SR 3.2.4.2 (QPTR verification).	Once per 12 hours
	OR	
	D.3 Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One or two channels inoperable.	E.1 Place inoperable channel(s) in bypass.	6 hours
	OR	
	E.2 Be in MODE 3.	12 hours
F. THERMAL POWER between P-6 and P-10, one or two Intermediate Range Neutron Flux channels inoperable.	F.1 Place inoperable channel(s) in bypass.	2 hours
	OR	
	F.2 Reduce THERMAL POWER to < P-6.	2 hours
	OR	
	F.3 Increase THERMAL POWER to > P-10.	2 hours
G. THERMAL POWER between P-6 and P-10, three Intermediate Range Neutron Flux channels inoperable.	G.1 Suspend operations involving positive reactivity additions.	Immediately
	AND	
	G.2 Reduce THERMAL POWER to < P-6.	2 hours
H. THERMAL POWER < P-6, one or two Intermediate Range Neutron Flux channels inoperable.	H.1 Restore three of four channels to OPERABLE status.	Prior to increasing THERMAL POWER to > P-6

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One or two Source Range Neutron Flux channels inoperable.	I.1 Suspend operations involving positive reactivity additions.	Immediately
J. Three Source Range Neutron Flux channels inoperable.	J.1 Open RTBs.	Immediately
K. One or two channels inoperable.	K.1 Place inoperable channel(s) in bypass.	6 hours
	OR	
	K.2 Reduce THERMAL POWER to < P-10.	12 hours
L. One or two channels inoperable.	L.1 Place inoperable channel(s) in bypass.	6 hours
	OR	
	L.2 Reduce THERMAL POWER to < P-8.	10 hours
M. One or two channels/ divisions inoperable.	M.1 Restore three of four channels/divisions to OPERABLE status.	6 hours
	OR	
	M.2 Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
N. One or two channels inoperable.	N.1 Verify the interlocks are in required state for existing plant conditions.	1 hour
	OR	
	N.2 Place the functions associated with inoperable interlocks in bypass.	7 hours
	OR	
	N.3 Be in MODE 3.	13 hours
O. One or two channels inoperable.	O.1 Verify the interlocks are in required state for existing plant conditions.	1 hour
	OR	
	O.2 Place the functions associated with inoperable interlocks in bypass.	7 hours
	OR	
	O.3 Be in MODE 2.	13 hours
P. One required division inoperable.	P.1 Open inoperable RTB in one division.	8 hours
	OR	
	P.2.1 Be in MODE 3, 4, or 5.	14 hours
	AND	
	P.2.2 Open RTBs.	14 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q. Three required divisions inoperable.	Q.1 Restore three of four divisions to OPERABLE status.	1 hour
	<u>OR</u>	
	Q.2.1 Be in MODE 3, 4, or 5.	7 hours
	<u>AND</u>	
	Q.2.2 Open RTBs.	7 hours
R. One or two channels/divisions inoperable.	R.1 Restore three of four channels/divisions to OPERABLE status.	48 hours
	<u>OR</u>	
	R.2 Open RTBs.	49 hours
S. One or two Source Range Neutron Flux channel inoperable.	S.1 Restore three of four channels to OPERABLE status.	48 hours
	<u>OR</u>	
	S.2 Open RTBs.	49 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
T. Required Source Range Neutron Flux channel inoperable.	T.1 Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	T.2 Close unborated water source isolation valves.	1 hour
	<u>AND</u>	
	T.3 Perform SR 3.1.1.1.	1 hour <u>AND</u> Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	------------------NOTES-------------- 1. Adjust nuclear instrument channel in the Protection and Safety Monitoring System (PMS) if absolute difference is > 2% RTP. 2. Required to be met within 12 hours after reaching 15% RTP. 3. If the calorimetric heat balance is < 70% RTP, and if the nuclear instrumentation channel indicated power is: a. lower than the calorimetric measurement by > 2%, then adjust the nuclear instrumentation channel upward to match the calorimetric measurement. b. higher than the calorimetric measurement, then no adjustment is required. -------------------------------------- Compare results of calorimetric heat balance to nuclear instrument channel output.	24 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.3	------------------NOTES-------------- 1. Adjust nuclear instrument channel in PMS if absolute difference is ≥ 3% AFD. 2. Required to be met within 24 hours after reaching 20% RTP. -------------------------------------- Compare results of the incore detector measurements to nuclear instrument channel AXIAL FLUX DIFFERENCE.	31 effective full power days (EFPD)
SR 3.3.1.4	------------------NOTE--------------- Required to be met within 24 hours after reaching 50% RTP. -------------------------------------- Calibrate excore channels to agree with incore detector measurements.	92 EFPD
SR 3.3.1.5	------------------NOTE--------------- This Surveillance must be performed on both reactor trip breakers associated with a single division. -------------------------------------- Perform TADOT.	92 days on a STAGGERED TEST BASIS
SR 3.3.1.6	------------------NOTES-------------- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -------------------------------------- Perform RTCOT.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.7	------------------NOTE------------------ This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. -- Perform RTCOT.	------NOTE------ Only required when not performed within previous 92 days ---------------- Prior to reactor startup <u>AND</u> Four hours after reducing power below P-10 for power and intermediate instrumentation <u>AND</u> Four hours after reducing power below P-6 for source range instrumentation <u>AND</u> Every 92 days thereafter

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.8	------------------NOTE--------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ------------------------------------- Perform CHANNEL CALIBRATION.	 24 months
SR 3.3.1.9	------------------NOTE-------------- Neutron detectors are excluded from CHANNEL CALIBRATION. ------------------------------------- Perform CHANNEL CALIBRATION.	 24 months
SR 3.3.1.10	------------------NOTE-------------- Verification of setpoint is not required. ------------------------------------- Perform TADOT.	 24 months
SR 3.3.1.11	------------------NOTE-------------- Neutron detectors are excluded from response time testing. ------------------------------------- Verify RTS RESPONSE TIME is within limits.	 24 months on a STAGGERED TEST BASIS

Table 3.3.1-1 (page 1 of 5)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.10		N/A
	3(a),4(a),5(a)	2	C	SR 3.3.1.10		N/A
2. Power Range Neutron Flux						
a. High Setpoint	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.6 SR 3.3.1.9 SR 3.3.1.11		[≤ 118% RTP]
b. Low Setpoint	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.11		[≤ 35% RTP]
3. Power Range Neutron Flux High Positive Rate	1,2	4	E	SR 3.3.1.6 SR 3.3.1.9		[≤ 5.0% RTP with time constant ≥ 2 sec*]
4. Intermediate Range Neutron Flux	1(b),2(c)	4	F,G	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9		[≤ 25% RTP*]
	2(d)	4	H	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9		[≤ 25% RTP*]
5. Source Range Neutron Flux High Setpoint	2(d)	4	I,J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.11		[≤ 1.0E5 cps*]
	3(a),4(a),5(a)	4	J,S	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.9 SR 3.3.1.11		N/A
	3(e),4(e),5(e)	1	T	SR 3.3.1.1 SR 3.3.1.9		N/A

(continued)

(a) With Reactor Trip Breakers (RTBs) closed and Plant Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(e) With RTBs open. In this condition, Source Range Function does not provide reactor trip but does provide indication.

[Reviewer Note: The values specified in brackets in the Trip Setpoint column are the Chapter 15 safety analysis values and are included for reviewer information only.

The values specified in brackets followed by " * " in the Trip Setpoint column are typical values for the Function. No credit was assumed for these Functions (typically diverse trips/actuations) in the Chapter 15 safety analyses and no safety analysis value is available.

In all cases, the values specified in brackets must be replaced, following the plant-specific setpoint study, with the actual Trip Setpoints. Upon selection of the plant specific instrumentation, the Trip Setpoints will be calculated in accordance with the setpoint methodology described in WCAP-14606. Allowable Values will be calculated in accordance with the setpoint methodology and specified in the Allowable Value column. The plant specific setpoint calculations will reflect the latest licensing analysis/design basis and may incorporate NRC accepted improvements in setpoint methodology.]

Table 3.3.1-1 (page 2 of 5)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
6.	Overtemperature ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11	Refer to Note 3 (Page 3.3-16)	Refer to Note 1 (Page 3.3-16)
7.	Overpower ΔT	1,2	4	E	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11	Refer to Note 4 (Page 3.3-16)	Refer to Note 2 (Page 3.3-16)
8.	Pressurizer Pressure						
	a. Low Setpoint	1(f)	4	K	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≥ 1785 psig]
	b. High Setpoint	1,2	4	E	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≤ 2445 psig]
9.	Pressurizer Water Level - High 3	1(f)	4	K	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8		[≤ 87%*]
10.	Reactor Coolant Flow - Low						
	a. Single Cold Leg	1(g)	4 per cold leg	L	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≥ 87%(i)]
	b. Two Cold Legs	1(h)	4 per cold leg	K	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≥ 87%(i)]

(continued)

(f) Above the P-10 (Power Range Neutron Flux) interlock.

(g) Above the P-8 (Power Range Neutron Flux) interlock.

(h) Above the P-10 (Power Range Neutron Flux) interlock and below the P-8 (Power Range Neutron Flux) interlock.

(i) Percent of thermal design flow.

Table 3.3.1-1 (page 3 of 5)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
11.	Reactor Coolant Pump (RCP) Bearing Water Temperature - High						
	a. Single Pump	$1^{(g)}$	4 per RCP	L	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8		[≥ 320°F*]
	b. Two Pumps	$1^{(h)}$	4 per RCP	K	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8		[≥ 320°F*]
12.	RCP Speed - Low	$1^{(f)}$	4	K	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8		[≥ 90%]
13.	Steam Generator (SG) Narrow Range Water Level - Low	1,2	4 per SG	E	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≥ 45000 lbm]
14.	Steam Generator (SG) Narrow Range Water Level - High 2	$1,2^{(k)}$	4 per SG	E	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11		[≤95%]
15.	Safeguards Actuation Input from Engineered Safety Feature Actuation System						
	a. Manual	1, 2	2	B	SR 3.3.1.10		N/A
	b. Automatic	1, 2	4	M	SR 3.3.1.6		N/A

(continued)

(f) Above the P-10 (Power Range Neutron Flux) interlock.

(g) Above the P-8 (Power Range Neutron Flux) interlock.

(h) Above the P-10 (Power Range Neutron Flux) interlock and below the P-8 (Power Range Neutron Flux) interlock.

(k) Above the P-11 (Pressurizer Pressure) interlock.

Table 3.3.1-1 (page 4 of 5)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
16.	Reactor Trip System Interlocks						
	a. Intermediate Range Neutron Flux, P-6	2	4	N	SR 3.3.1.6 SR 3.3.1.9		[≥ 1E-10 amps]
	b. Power Range Neutron Flux, P-8	1	4	O	SR 3.3.1.6 SR 3.3.1.9		[≤ 48% RTP]
	c. Power Range Neutron Flux, P-10	1,2	4	N	SR 3.3.1.6 SR 3.3.1.9		[10% RTP]
	d. Pressurizer Pressure, P-11	1,2	4	N	SR 3.3.1.6 SR 3.3.1.9		[≤ 1970 psig]
17.	Reactor Trip Breakers	1,2 3(j),4(j),5(j)	3 divisions with 2 RTBs per division	P,Q	SR 3.3.1.5		N/A
18.	Reactor Trip Breaker (RTB) Undervoltage and Shunt Trip Mechanisms	1,2 3(j),4(j),5(j)	1 each per RTB mechanism for required RTBs	P,Q	SR 3.3.1.5		N/A
19.	Automatic Trip Logic	1,2	4 divisions	M	SR 3.3.1.6		N/A
		3(j),4(j),5(j)	4 divisions	R	SR 3.3.1.6		N/A
20.	ADS Stages 1, 2, and 3 Actuation						
	a. Manual	1,2	2 switch sets	B	SR 3.3.1.10		N/A
		3(j),4(j),5(j)	2 switch sets	B	SR 3.3.1.10		N/A
	b. Automatic	1,2	4	M	SR 3.3.1.6		N/A
		3(j),4(j),5(j)	4	R	SR 3.3.1.6		N/A
21.	Core Makeup Tank Actuation						
	a. Manual	1,2	2 switch sets	B	SR 3.3.1.10		N/A
		3(j),4(j),5(j)	2 switch sets	B	SR 3.3.1.10		N/A
	b. Automatic	1,2	4	M	SR 3.3.1.6		N/A
		3(j),4(j),5(j)	4	R	SR 3.3.1.6		N/A

(j) With Reactor Trip Breakers closed and Plant Control System capable of rod withdrawal.

Table 3.3.1-1 (page 5 of 5)
Reactor Trip System Instrumentation

Note 1: Overtemperature ΔT

$$\Delta T\frac{(1+\tau_4 s)}{(1+\tau_5 s)} \le \Delta T_0 \left\{K_1 - K_2\frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left[T-T'\right] + K_3(P-P') - f_1(\Delta I)\right\}$$

Where:

ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RATED THERMAL POWER, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the indicated T_{avg} at 100% RTP, °F.

P is the measured pressurizer pressure, psig.
P' is the nominal RCS operating pressure, 2235 psig.

$K_1 \le 2.1$	$K_2 = 0.03/°F$	$K_3 = 0.002/psig$
$\tau_1 \ge 33$ sec	$\tau_2 \le 4$ sec	
$\tau_4 = 0$ sec	$\tau_5 = 0$ sec	

$f_1(\Delta I)$ = 0.0% / % when $q_t - q_b < -1\%$ RTP
4.915% / %$\{(q_t - q_b) + 1\}$ when $q_t - q_b \ge -1\%$ RTP

Where q_t and q_b are percent RTP in the upper and lower halves of the core respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.

Note 2: Overpower ΔT

$$\Delta T\frac{(1+\tau_4 s)}{(1+\tau_5 s)} \le \Delta T_0 \left\{K_4 - K_5\frac{\tau_3 s}{1+\tau_3 s}T - K_6\left[T-T''\right] - f_2(\Delta I)\right\}$$

Where:

ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RATED THERMAL POWER, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T'' is the indicated T_{avg} at 100% RTP, °F.

$K_4 \le 1.145$	$K_5 \ge 0.02/°F$ for increasing T_{avg} 0/°F for decreasing T_{avg}	$K_6 \ge 0.00219/°F$ 0/°F	when T > T'' when T ≤ T''
$\tau_3 \ge 10$ sec	$\tau_4 = 0$ sec	$\tau_5 = 0$ sec	

$f_2(\Delta I)$ = 0% of RTP for all ΔI.

Note 3:

The channel's maximum as left trip setpoint shall not exceed its computed Trip Setpoint by more than [TBD] ΔT span for the ΔT channel, the Tavg channel and the Pressurizer Pressure channel and [TBD] ΔT span for the f(ΔI) channel.

Note 4:

The channel's maximum as left trip setpoint shall not exceed its computed Trip Setpoint by more than [TBD] ΔT span for the ΔT channel and the Tavg channel.

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

------------------------------------NOTES------------------------------------

1. Separate condition entry is allowed for each Function.
2. The Conditions for each Function are given in Table 3.3.2-1. If the Required Actions and associated Completion Times of the first Condition are not met, refer to the second Condition.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or divisions inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or division(s).	Immediately
B. One or two channels or divisions inoperable.	B.1 Place inoperable channel(s) and division(s) in bypass.	6 hours
C. One channel inoperable.	C.1 Place inoperable channel in bypass.	6 hours
D. One required division inoperable.	D.1 Restore required division to OPERABLE status.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. One switch or switch set inoperable.	E.1	Restore switch and switch set to OPERABLE status.	48 hours
F. One channel inoperable	F.1	Restore channel to OPERABLE status.	72 hours
	<u>OR</u>		
	F.2.1	Verify alternate radiation monitors are OPERABLE.	72 hours
	<u>AND</u>		
	F.2.2	Verify control room isolation and air supply initiation manual controls are OPERABLE.	72 hours
G. One switch, switch set, channel, or division inoperable.	G.1	Restore switch, switch set, channel, and division to OPERABLE status.	72 hours
H. One channel inoperable.	H.1	Place channel in trip.	6 hours
I. One or two channels inoperable.	I.1	Place one channel in bypass.	6 hours
	<u>AND</u>		
	I.2	With two channels inoperable, place one channel in trip.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. One or two interlocks inoperable.	J.1	Verify the interlocks are in the required state for the existing plant conditions.	1 hour
	OR		
	J.2	Place any Functions associated with inoperable interlocks in bypass.	7 hours
K. Required Action and associated Completion Time not met.	K.1	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		
	K.2	Suspend CORE ALTERATIONS.	Immediately
L. Required Action and associated Completion Time not met.	L.1	Be in MODE 3.	6 hours
M. Required Action and associated Completion Time not met.	M.1	Be in MODE 3.	6 hours
	AND		
	M.2	Be in MODE 4.	12 hours
N. Required Action and associated Completion Time not met.	N.1	Be in MODE 3.	6 hours
	AND		
	N.2	Be in MODE 4 with the RCS cooling provided by the RNS.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
O. Required Action and associated Completion Time not met.	O.1	Be in MODE 3.	6 hours
	AND		
	O.2	Be in MODE 5.	36 hours
P. Required Action and associated Completion Time not met.	P.1	---------NOTE-------- Flow path(s) may be unisolated intermittently under administrative controls. ---------------------	
		Isolate the affected flow path(s).	24 hours
	AND		
	P.2.1	Isolate the affected flow path(s) by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	7 days
	OR		
	P.2.2	Verify the affected flow path is isolated.	Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
Q. Required Action and associated Completion Time not met.	Q.1	--------NOTE-------- Flow path(s) may be unisolated intermittently under administrative controls. -------------------- Isolate the affected flow path(s) by use of at least one closed manual or closed and de-activated automatic valve.	6 hours
	OR		
	Q.2.1	Be in MODE 3.	12 hours
	AND		
	Q.2.2	Be in MODE 4.	18 hours
R. Required Action and associated Completion Time not met.	R.1	Be in MODE 3.	6 hours
	AND		
	R.2.1.1	--------NOTE-------- Flow path(s) may be unisolated intermittently under administrative controls. -------------------- Isolate the affected flow path(s).	12 hours
		AND	
	R.2.1.2	Verify the affected flow path is isolated.	Once per 7 days
			(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
R. (continued)	<u>OR</u>	
	R.2.2 Be in MODE 4 with the RCS cooling provided by the RNS.	30 hours
S. Required Action and associated Completion Time not met.	S.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	S.2.1.1 Be in MODE 4 with the RCS cooling provided by the RNS.	24 hours
	<u>AND</u>	
	S.2.1.2 -------NOTE-------- Flow path(s) may be unisolated intermittently under administrative controls. ------------------	
	Isolate the affected flow path(s).	30 hours
	<u>AND</u>	
	S.2.1.3 Verify the affected flow path is isolated.	Once per 7 days
	<u>OR</u>	
	S.2.2 Be in MODE 5.	42 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
T. Required Action and associated Completion Time not met.	T.1.1	---------NOTE------- Flow path(s) may be unisolated intermittently under administrative controls. -------------------	
		Isolate the affected flow path(s).	6 hours
	AND		
	T.1.2.1	Isolate the affected flow path(s) by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	7 days
		OR	
	T.1.2.2	Verify the affected flow path is isolated.	Once per 7 days
	OR		
	T.2.1	Be in MODE 3.	12 hours
	AND		
	T.2.2	Be in MODE 5.	42 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
U. Required Action and associated Completion Time not met.	U.1	Be in MODE 5.	12 hours
	AND		
	U.2	Initiate action to open the RCS pressure boundary and establish a pressurizer level ≥ 20%.	12 hours
V. Required Action and associated Completion Time not met.	V.1	Restore the inoperable channel(s).	168 hours
	OR		
	V.2.1	Be in MODE 5.	180 hours
		AND	
	V.2.2	Initiate action to open the RCS pressure boundary and establish a pressurizer level ≥ 20%.	180 hours
W. Required Action and associated Completion Time not met.	W.1	If in MODE 5 with the RCS open and < 20% pressurizer level, initiate action to be MODE 5 with the RCS pressure boundary open and ≥ 20% pressurizer level.	Immediately
	AND		
	W.2	If in MODE 5, isolate the flow path from the demineralized water storage tank to the RCS by use of at least one closed and de-activated automatic valve or closed manual valve.	Immediately
	AND		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
W. (continued)	W.3	If in MODE 6, initiate action to be in MODE 6 with the water level $\geq$ 23 feet above the top of the reactor vessel flange.	Immediately
	<u>AND</u>		
	W.4	Suspend positive reactivity additions.	Immediately
X. Required Action and associated Completion Time not met.	X.1	If in MODE 5 with RCS open and < 20% pressurizer level, initiate action to be in MODE 5 with RCS open and $\geq$ 20% pressurizer level.	Immediately
	<u>AND</u>		
	X.2	If in MODE 6 with upper internals in place, initiate action to be in MODE 6 with the upper internals removed.	Immediately
	<u>AND</u>		
	X.3	Suspend positive reactivity additions.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
Y. Required Action and associated Completion Time not met.	Y.1	Suspend positive reactivity additions.	Immediately
	<u>AND</u>		
	Y.2	If in MODE 4, be in MODE 5.	12 hours
	<u>AND</u>		
	Y.3	If in MODE 4 or 5, initiate action to establish a pressurizer level $\geq$ 20% with the RCS pressure boundary intact.	12 hours
	<u>AND</u>		
	Y.4	If in MODE 6, initiate action to be in MODE 6 with the water level $\geq$ 23 feet above the top of the reactor vessel flange.	Immediately
Z. Required Action and associated Completion Time not met.	Z.1	-------NOTE------- Flow path(s) may be unisolated intermittently under administrative controls. ------------------	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Z. (continued)	Isolate the affected flow path(s) by use of at least one closed manual or closed and deactivated automatic valve.	6 hours
	OR	
	Z.2.1 Be in MODE 3.	12 hours
	AND	
	Z.2.2 Be in MODE 4 with the RCS cooling provided by the RNS.	30 hours
AA. Required Action and associated Completion Time not met.	AA.1.1 -------NOTE-------- Flow path(s) may be unisolated intermittently under administrative controls. -------------------	
	Isolate the affected flow path(s).	24 hours
	AND	
	AA.1.2.1 Isolate the affected flow path(s) by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	7 days
	OR	
	AA.1.2.2 Verify the affected flow path is isolated.	Once per 7 days
	OR	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
AA. (continued)	AA.2.1 If in MODE 4, be in MODE 5.	12 hours
	<u>AND</u>	
	AA.2.2 If in MODE 4 or 5, initiate action to establish a pressurizer level ≥ 20%.	12 hours
	<u>AND</u>	
	AA.2.3 If in MODE 6, initiate action to be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange.	Immediately
BB. One channel inoperable.	BB.1.1 Place channel in bypass.	6 hours
	<u>AND</u>	
	BB.1.2 Continuously monitor hot leg level.	6 hours

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.2-1 to determine which SRs apply for each Engineered Safety Features (ESF) Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	92 days on a STAGGERED TEST BASIS
SR 3.3.2.3	------------------NOTE------------------ Verification of setpoint not required for manual initiation functions. -- Perform TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT).	24 months
SR 3.3.2.4	------------------NOTE------------------ This surveillance shall include verification that the time constants are adjusted to the prescribed values. -- Perform CHANNEL CALIBRATION.	24 months
SR 3.3.2.5	Perform CHANNEL OPERATIONAL TEST (COT).	92 days
SR 3.3.2.6	Verify ESFAS RESPONSE TIMES are within limit.	24 months on a STAGGERED TEST BASIS

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.7	------------------NOTE------------------ This Surveillance is not required to be performed for actuated equipment which is included in the Inservice Test (IST) Program. --------------------------------------- Perform ACTUATION DEVICE TEST.	24 months
SR 3.3.2.8	Perform ACTUATION DEVICE TEST for squib valves.	24 months
SR 3.3.2.9	Perform ACTUATION DEVICE TEST for pressurizer heater circuit breakers.	24 months

Table 3.3.2-1 (page 1 of 13)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Safeguards Actuation						
a. Manual Initiation	1,2,3,4	2 switches	E,O	SR 3.3.2.3		N/A
	5	2 switches	G,Y	SR 3.3.2.3		N/A
b. Containment Pressure - High 2	1,2,3,4	4	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 8.0 psig]
c. Pressurizer Pressure - Low	1,2,3(a)	4	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1685 psig]
d. Steam Line Pressure - Low	1,2,3(a)	4 per steam line	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 405](b)
e. RCS Cold Leg Temperature (T_{cold}) - Low	1,2,3(a)	4 per loop	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 490°F]

(continued)

(a) Above the P-11 (Pressurizer Pressure) interlock, when the RCS boron concentration is below that necessary to meet the shutdown margin requirements at an RCS temperature of 200°F.

(b) Time constants used in the lead/lag controller are $\tau_1 \geq [50]$ seconds and $\tau_2 \leq [5]$ seconds.

Reviewer Note: The values specified in brackets in the Trip Setpoint column are the Chapter 15 safety analysis values and are included for reviewer information only.

The values specified in brackets followed by " * " in the Trip Setpoint column are typical values for the Function. No credit was assumed for these Functions (typically diverse trips/actuations) in the Chapter 15 safety analyses and no safety analysis value is available.

The "Battery Charger Input Voltage - Low" Functions (15.c and 20.b) value specified is a typical value for the Function. The actual value will depend on the capabilities of the equipment selected with regard to its ability to function with degraded voltage as well as the setpoint methodology.

Following the setpoint study, the values specified in brackets must be replaced with the actual Trip Setpoints. Upon selection of the instrumentation the Trip Setpoints will be calculated in accordance with the setpoint methodology described in WCAP-14606. Allowable Values will be calculated in accordance with the setpoint methodology and specified in the Allowable Value column. The setpoint calculations will reflect the design basis and incorporate NRC accepted setpoint methodology.

The Containment Pressure - High 2 setpoint (Functions 1.b, 4.b, and 12.b) should be specified as low as reasonable, without creating potential for spurious trips during normal operations, consistent with the TMI action item (II.E.4.2) guidance.

Table 3.3.2-1 (page 2 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
2.	Core Makeup Tank (CMT) Actuation						
	a. Manual Initiation	1,2,3,4$^{(j)}$	2 switches	E,N	SR 3.3.2.3		N/A
		4$^{(n)}$, 5$^{(i)}$	2 switches	E,U	SR 3.3.2.3		N/A
	b. Pressurizer Water Level - Low 2	1,2,3,4$^{(j)}$	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 7.0%*] [≥ 1.0%]
		4$^{(n)}$, 5$^{(i)}$	4	B,V	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 7.0%*] [≥ 1.0%]
	c. Safeguards Actuation	1,2,3,4,5$^{(i)}$	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.				
	d. ADS Stages 1, 2, & 3 Actuation	1,2,3,4,5$^{(i)}$	Refer to Function 9 (ADS Stages 1, 2 & 3 Actuation) for all initiating functions and requirements.				
3.	Containment Isolation						
	a. Manual Initiation	1,2,3,4	2 switches	E,O	SR 3.3.2.3		N/A
		5$^{(m)}$,6$^{(m)}$	2 switches	G,Y	SR 3.3.2.3		N/A
	b. Manual Initiation of Passive Containment Cooling	1,2,3,4,5$^{(e,m)}$,6$^{(e,m)}$	Refer to Function 12.a (Passive Containment Cooling Actuation) for initiating functions and requirements.				
	c. Safeguards Actuation	1,2,3,4,5$^{(m)}$	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.				

(continued)

(e) With decay heat > 6.0 MWt.

(i) With the RCS pressure boundary intact.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(m) Not applicable for valve isolation Functions whose associated flow path is isolated.

(n) With the RCS being cooled by the RNS.

Table 3.3.2-1 (page 3 of 13)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
4. Steam Line Isolation						
a. Manual Initiation	1,2(l),3(l),4(l)	2 switches	E,S	SR 3.3.2.3		N/A
b. Containment Pressure – High 2	1,2(l),3(l),4(l)	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 8.0 psig]
c. Steam Line Pressure						
(1) Steam Line Pressure – Low	1,2(l),3(a,l)	4 per steam line	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 405](b)
(2) Steam Line Pressure-Negative Rate – High	3(d,l)	4 per steam line	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 100 psi with time constant ≥ 50 seconds]
d. T_{cold} – Low	1,2(l),3(a,l)	4 per loop	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 490°F]
5. Turbine Trip						
a. Manual Main Feedwater Isolation	1,2	Refer to Function 6.a (Manual Main Feedwater Control Valve Isolation) for requirements.				
b. SG Narrow Range Water Level – High 2	1,2	4 per SG	B,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 95%]
c. Safeguards Actuation	1,2	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.				
d. Reactor Trip	1,2	Refer to Function 18.a (ESFAS Interlocks, Reactor Trip, P-4) for requirements.				

(continued)

(a) Above the P-11 (Pressurizer Pressure) interlock, when the RCS boron concentration is below that necessary to meet the shutdown margin requirements at an RCS temperature of 200°F.

(b) Time constants used in the lead/lag controller are $\tau_1 \geq [50]$ seconds and $\tau_2 \leq [5]$ seconds.

(d) Below the P-11 (Pressurizer Pressure) interlock.

(l) Not applicable if all MSIVs are closed.

Table 3.3.2-1 (page 4 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
6.	Main Feedwater Control Valve Isolation						
	a. Manual Initiation	1,2,3,4(m)	2 switches	E,S	SR 3.3.2.3		N/A
	b. SG Narrow Range Water Level - High 2	1,2,3,4(j,m)	4 per SG	B,R	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 95%]
	c. Safeguards Actuation	1,2,3,4(m)	Refer to Function 1 (Safeguards Actuation) for all initiating functions and requirements.				
	d. Reactor Coolant Average Temperature (T_{avg}) - Low 1	1,2	4	B,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 542°F*]
	Coincident with Reactor Trip	1,2	Refer to Function 18.a (ESFAS Interlocks, Reactor Trip, P-4) for requirements.				
7.	Main Feedwater Pump Trip and Valve Isolation						
	a. Manual Initiation	Refer to Function 6.a (Manual Main Feedwater Control Valve Isolation) for requirements.					
	b. SG Narrow Range Water Level - High 2	1,2,3,4(j,m)	4 per SG	B,R	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 95%]
	c. Safeguards Actuation	1,2,3,4(m)	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.				
	d. Reactor Coolant Average Temperature T_{avg} - Low 2	1,2	2 per loop	B,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 542°F*]
	Coincident with Reactor Trip	1,2	Refer to Function 18.a (ESFAS Interlocks, Reactor Trip, P-4) for requirements.				

(continued)

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(m) Not applicable for valve isolation Functions whose associated flow path is isolated.

Table 3.3.2-1 (page 5 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
8.	Startup Feedwater Isolation						
	a. SG Narrow Range Water Level - High 2	1,2,3,4(o)	4 per SG	B,S	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 95%]
	b. T_{cold} - Low	1,2,3(a)	4 per loop	B,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 490°F]
	c. Manual Initiation	Refer to Function 6.a (Manual Main Feedwater Control Valve Isolation) for requirements.					
9.	ADS Stages 1, 2 & 3 Actuation						
	a. Manual Initiation	1,2,3,4	2 switch sets	E,O	SR 3.3.2.3		N/A
		5(k),6(g,k)	2 switch sets	G,X	SR 3.3.2.3		N/A
	b. Core Makeup Tank (CMT) Level - Low 1	1,2,3,4	4 per tank	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 67.5%] volume
		5(c,k)	4 per OPERABLE tank	B,V	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 67.5%] volume
	Coincident with CMT Actuation	Refer to Function 2 (CMT Actuation) for all initiating functions and requirements.					

(continued)

(a) Above the P-11 (Pressurizer Pressure) interlock, when the RCS boron concentration is below that necessary to meet the shutdown margin requirements at an RCS temperature of 200°F.

(c) With pressurizer level ≥ 20%.

(g) With upper internals in place.

(o) Not applicable when the startup feedwater flow paths are isolated.

(k) Not applicable when the required ADS valves are open. See LCO 3.4.13 and LCO 3.4.14 for ADS valve and equivalent relief area requirements.

Table 3.3.2-1 (page 6 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
10.	ADS Stage 4 Actuation						
	a. Manual Initiation Coincident with	1,2,3,4	2 switch sets	E,O	SR 3.3.2.3		N/A
		$5^{(k)}, 6^{(g,k)}$	2 switch sets	G,X	SR 3.3.2.3		N/A
	RCS Wide Range Pressure - Low, or	1,2,3,4	4	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1200 psig]
		$5^{(k)}, 6^{(g,k)}$	4	B,X	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1200 psig]
	ADS Stages 1, 2 & 3 Actuation	Refer to Function 9 (Stages 1, 2, & 3 Actuation) for initiating functions and requirements					
	b. CMT Level - Low 2	1,2,3,4	4 per tank	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 20% volume level span]
		$5^{(c,k)}$	4 per OPERABLE tank	B,V	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 20% volume level span]
	Coincident with RCS Wide Range Pressure - Low, and	1,2,3,4	4	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1200 psig]
		$5^{(c,k)}$	4	B,V	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1200 psig]
	Coincident with ADS Stages 1, 2 & 3 Actuation	$1,2,3,4,5^{(c,k)}$	Refer to Function 9 (ADS Stages 1, 2 & 3 Actuation) for initiating functions and requirements				
	c. Coincident RCS Loop 1 and 2 Hot Leg Level - Low 2	$4^{(n)}, 5^{(k)}, 6^{(k)}$	1 per loop	BB,Y	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 3 in. above inside surface of the bottom of the hot legs]

(continued)

(c) With pressurizer level ≥ 20%.

(g) With upper internals in place.

(k) Not applicable when the required ADS valves are open. See LCO 3.4.13 and LCO 3.4.14 for ADS valve and equivalent relief area requirements.

Table 3.3.2-1 (page 7 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
11.	Reactor Coolant Pump Trip						
	a. ADS Stages 1, 2 & 3 Actuation	Refer to Function 9 (ADS Stages 1, 2 & 3 Actuation) for initiating functions and requirements.					
	b. Reactor Coolant Pump Bearing Water Temperature – High	1,2	4 per RCP	B,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 320°F*]
	c. Manual CMT Actuation	Refer to Function 2.a (Manual CMT Actuation) for requirements.					
	d. Pressurizer Water Level - Low 2	1,2,3,4(j)	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 7.0%*] [≥ 1.0%]
		4(n), 5(c,j)	4	B,V	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 7.0%*] [≥ 1.0%]
	e. Safeguards Actuation	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.					
12.	Passive Containment Cooling Actuation						
	a. Manual Initiation	1,2,3,4	2 switches	E,O	SR 3.3.2.3		N/A
		5(e),6(e)	2 switches	G,Y	SR 3.3.2.3		N/A
	b. Containment Pressure – High 2	1,2,3,4	4	B,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 8.0 psig]

(continued)

(c) With pressurizer level ≥ 20%.

(e) With decay heat > 6.0 MWt.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(n) With the RCS being cooled by the RNS.

Table 3.3.2-1 (page 8 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
13.	Passive Residual Heat Removal Heat Exchanger Actuation						
	a. Manual Initiation	1,2,3,4	2 switches	E,O	SR 3.3.2.3		N/A
		5(i)	2 switches	E,U	SR 3.3.2.3		N/A
	b. SG Narrow Range Water Level - Low	1,2,3,4(j)	4 per SG	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 45,000 lbm]
	Coincident with Startup Feedwater Flow - Low	1,2,3,4(j)	2 per feedwater line	H,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 200 gpm per SG*]
	c. SG Wide Range Water Level - Low	1,2,3,4(j)	4 per SG	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 25,000 lbm]
	d. ADS Stages 1,2 & 3 Actuation	1,2,3,4,5(i)	Refer to Function 9 (ADS Stages 1, 2 & 3 Actuation) for initiating functions and requirements.				
	e. CMT Actuation	Refer to Function 2 (CMT Actuation) for initiating functions and requirements.					
	f. Pressurizer Water Level, High 3	1,2,3,4(j,p)	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤87%*]

(continued)

(i) With the RCS pressure boundary intact.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(p) Above the P-19 (RCS Pressure) interlock.

Table 3.3.2-1 (page 9 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
14.	SG Blowdown Isolation						
	a. Passive Residual Heat Removal Heat Exchanger Actuation	$1,2,3,4^{(j,m)}$	Refer to Function 13 (Passive Residual Heat Removal Heat Exchanger Actuation) for all initiating functions and requirements.				
	b. SG Narrow Range Water Level - Low	$1,2,3,4^{(j)}$	4 per SG	B,R	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 45,000 lbm]
15.	Boron Dilution Block						
	a. Source Range Neutron Flux Multiplication	$2^{(f)},3,4^{(m)}$	4	B,T	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ Source Range Flux X 1.6 in 50 minutes]
		$5^{(m)}$	4	B,P	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ Source Range Flux X 1.6 in 50 minutes
	b. Reactor Trip	Refer to Function 18.a (ESFAS Interlocks, Reactor Trip, P-4) for all requirements.					
	c. Battery Charger Input Voltage - Low	$1,2,3,4^{(m)}$	4 divisions	B,T	SR 3.3.2.3 SR 3.3.2.4		[≥ 343 V*]
		$5^{(m)}$	4 divisions	B,P	SR 3.3.2.3 SR 3.3.2.4		[≥ 343 V*]
16.	Chemical Volume and Control System Makeup Isolation						
	a. SG Narrow Range Water Level - High 2	$1,2,3^{(m)},4^{(j,m)}$	4 per SG	B,R	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 95%]
	b. Pressurizer Water Level - High 1	$1,2,3^{(m)}$	4	B,Q	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 30%*]
	Coincident with Safeguards Actuation	$1,2,3^{(m)}$	Refer to Function 1 (Safeguards Actuation) for initiating functions and requirements.				
	c. Pressurizer Water Level - High 2	$1,2,3,4^{(j,m,p)}$	4	B,T	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 74%]
	d. Containment Radioactivity - High 2	$1,2,3^{(m)}$	4	B,Q	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 100 R/hr]
	e. Manual Initiation	$1,2,3^{(m)},4^{(j,m)}$	2 switches	E,R	SR 3.3.2.3		N/A

(continued)

(f) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(m) Not applicable for valve isolation Functions whose associated flow path is isolated.

(p) Above the P-19 (RCS Pressure) interlock.

Table 3.3.2-1 (page 10 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
17.	Normal Residual Heat Removal System Isolation						
	a. Containment Radioactivity - High 2	1,2,3(m)	4	B,Q	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 100 R/hr]
	b. Safeguards Actuation	1,2,3(m)	Refer to Function 1 (Safeguards Actuation) for all initiating functions and requirements.				
	c. Manual Initiation	1,2,3(m)	2 switch sets	E,Q	SR 3.3.2.3		N/A
18.	ESFAS Interlocks						
	a. Reactor Trip, P-4	1,2,3	3 divisions	D,M	SR 3.3.2.3		N/A
	b. Pressurizer Pressure, P-11	1,2,3	4	J,M	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 1970 psig]
	c. Intermediate Range Neutron Flux, P-6	2	4	J,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 1E-10 amps]
	d. Pressurizer Level, P-12	1,2,3,4,5,6	4	J,M BB,Y	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[Above Pressurizer Water Level - Low 1 setpoint of 20%]
	e. RCS Pressure, P-19	1,2,3,4(j)	4	J,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥700 psig]
19.	Containment Air Filtration System Isolation						
	a. Containment Radioactivity - High 1	1,2,3,4(j)	4	B,Z	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 2 R/hr]
	b. Containment Isolation	Refer to Function 3 (Containment Isolation) for initiating functions and requirements.					

(continued)

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(m) Not applicable for valve isolation Functions whose associated flow path is isolated.

Table 3.3.2-1 (page 11 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
20.	Main Control Room Isolation and Air Supply Initiation						
	a. Control Room Air Supply Radiation - High 2	1,2,3,4	2	F,O	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 2x10^{-6} curies/m^3 Dose Equivalent I-131]
		Note (h)	2	G,K	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≤ 2x10^{-6} curies/m^3 Dose Equivalent I-131]
	b. Battery Charger Input Voltage - Low	1,2,3,4	4 divisions	B,O	SR 3.3.2.3 SR 3.3.2.4		[≥343 V*]
		Note (h)	4 divisions	G,K	SR 3.3.2.3 SR 3.3.2.4		[≥ 343 V*]
21.	Auxiliary Spray and Purification Line Isolation						
	a. Pressurizer Water Level - Low 1	1,2	4	B,L	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[20.0%*]
	b. Manual Initiation	1,2	Refer to Function 16.e (Manual Chemical Volume Control System (Makeup Isolation) for requirements.				
22.	In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation						
	a. Manual Initiation	1,2,3,4$^{(j)}$	2 switch sets	E,N	SR 3.3.2.3		N/A
		4$^{(n)}$,5,6	2 switch sets	G,Y	SR 3.3.2.3		N/A
	b. ADS 4th Stage Actuation	Refer to Function 10 (ADS 4th Stage Actuation) for initiating functions and requirements.					
	c. Coincident RCS Loop 1 and 2 Hot Leg Level - Low 2	4$^{(n)}$,5,6	1 per loop	BB,Y	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 3 in. above inside surface of the bottom of the hot legs]

(continued)

(h) During movement of irradiated fuel assemblies and during CORE ALTERATIONS.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(n) With the RCS being cooled by the RNS.

Table 3.3.2-1 (page 12 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
23.	IRWST Containment Recirculation Valve Actuation						
	a. Manual Initiation	1,2,3,4$^{(j)}$	2 switch sets	E,N	SR 3.3.2.3		N/A
		4$^{(n)}$,5,6	2 switch sets	G,Y	SR 3.3.2.3		N/A
	b. ADS Stage 4 Actuation	Refer to Function 10 (ADS Stage 4 Actuation) for all initiating functions and requirements.					
	Coincident with IRWST Level - Low 3	1,2,3,4$^{(j)}$	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ Containment Elevation @ 107'2"]
		4$^{(n)}$,5$^{(k)}$,6$^{(k)}$	4	I,Y	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ Containment Elevation @ 107'2"]
24.	Spent Fuel Pool Isolation						
	a. Spent Fuel Pool Level - Low	6	3	C,P	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[37.5 ft.]
25.	ESFACs Logic						
	a. Actuation Subsystems	1,2,3,4	4 divisions, 1 battery-backed subsystem per division	D,O	SR 3.3.2.2		N/A
		5,6	4 divisions, 1 battery-backed subsystem per division	G,W	SR 3.3.2.2		N/A

(continued)

(k) Not applicable when the required ADS valves are open. See LCO 3.4.13 and LCO 3.4.14 for ADS valve and equivalent relief area requirements.

Table 3.3.2-1 (page 13 of 13)
Engineered Safeguards Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
26.	PLCs						
	a. Functional Logic Subsystem	1,2,3,4	4 divisions, 1 battery-backed subsystem per cabinet	D,O	SR 3.3.2.2 SR 3.3.2.7 SR 3.3.2.8		N/A
		5,6	4 divisions, 1 battery-backed subsystem per cabinet	G,W	SR 3.3.2.2 SR 3.3.2.7		N/A
27.	Pressurizer Heater Trip						
	a. Core Makeup Tank Actuation	1,2,3,4(j,p)	Refer to Function 2 (Core Makeup Tank Actuation) for all initiating functions and requirements. In addition to the requirements for Function 2, SR 3.3.2.9 also applies.				
	b. Pressurizer Water Level, High 3	1,2,3,4(j,p)	4	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[87%*]
28.	Chemical and Volume Control System Letdown Isolation						
	a. Hot Leg Level - Low 1	4(n),5,6(q)	1 per loop	C,AA	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[≥ 18 in. above inside surface of the bottom of the hot legs]
29.	SG Power Operated Relief Valve and Block Valve Isolation						
	a. Manual Initiation	1,2,3,4(j)	2 switches	E,N	SR 3.3.2.3		N/A
	b. Steam Line Pressure - Low	1,2,3,4(j)	4 per steam line	B,N	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.5 SR 3.3.2.6		[405 psig](b)

(b) Time constants used in the lead/lag controller are $\tau_1 \geq$ [50] seconds and $\tau_2 \leq$ [5] seconds.

(j) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(m) Not applicable for valve isolation Functions whose associated flow path is isolated.

(n) With the RCS being cooled by the RNS.

(p) Above the P-19 (RCS Pressure) interlock.

(q) With the water level < 23 feet above the top of the reactor vessel flange.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

------------------------------NOTES------------------------------

1. LCO 3.0.4 not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.7.	Immediately
C. --------NOTE------ Not applicable to hydrogen monitor channels. ----------------- One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two hydrogen monitor channels inoperable.	D.1 Restore one hydrogen monitor channel to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Conditions C or D not met.	E.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
F. As required by Required Action E.1 and referenced in Table 3.3.3-1.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.3.2	--------------NOTE-------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -------------------------------- Perform CHANNEL CALIBRATION.	24 months

Table 3.3.3-1 (page 1 of 1)
Post-Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS/ DIVISIONS	CONDITION REFERENCED FROM REQUIRED ACTION E.1
1.	Neutron Flux (Power, Intermediate and Source Range)	2	F
2.	Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	2	F
3.	RCS Cold Leg Temperature (Wide Range)	2	F
4.	RCS Pressure (Wide Range)	2	F
5.	Pressurizer Pressure and RCS Subcooling Monitor[a]	2	F
6.	Containment Water Level	2	F
7.	Containment Pressure	2	F
8.	Containment Pressure (Extended Range)	2	F
9.	Containment Area Radiation (High Range)	2	F
10.	Hydrogen Monitors	2	F
11.	Pressurizer Level and Associated Reference Leg Temperature	2	F
12.	IRWST Water Level	2	F
13.	PRHR Flow and PRHR Outlet Temperature	2 flow & 1 temperature	F
14.	Core Exit Temperature--Quadrant 1	2[b]	F
15.	Core Exit Temperature--Quadrant 2	2[b]	F
16.	Core Exit Temperature--Quadrant 3	2[b]	F
17.	Core Exit Temperature--Quadrant 4	2[b]	F
18.	PCS Storage Tank Level and PCS Flow	2 level & 1 flow	F
19.	Remotely Operated Containment Isolation Valve Position	1/valve[c]	F
20.	IRWST to RNS Suction Valve Status	2	F

(a) RCS Subcooling calculated from pressurizer pressure and RCS hot leg temperature.

(b) A channel consists of two thermocouples within a single division. Each quadrant contains two divisions. The minimum requirement is two operable thermocouples in each of the two divisions.

(c) Not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown Workstation

LCO 3.3.4 The Remote Shutdown Workstation (RSW) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with RCS average temperature (T_{avg}) $\geq$ 350°F.

ACTIONS

-----------------------------------NOTE-----------------------------------
LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RSW inoperable.	A.1 Restore to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. __AND__ B.2 Be in MODE 4 with T_{avg} < 350°F.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Verify each required transfer switch is capable of performing the required function.	24 months
SR 3.3.4.2	Verify that the RSW communicates indication and controls with Division A, B, C and D of the PMS.	24 months
SR 3.3.4.3	Verify the OPERABILITY of the RSW hardware and software.	24 months
SR 3.3.4.4	Perform TADOT of the reactor trip breaker open/closed indication.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, RCS average temperature, and RCS total flow rate shall be within the limits specified below:

a. Pressurizer Pressure ≥ 2185 psig

b. RCS Average Temperature ≤ 574.1°F, and

c. RCS total flow rate ≥ 193,200 gpm.

APPLICABILITY: MODE 1.

---------------------------NOTE---------------------------
Pressurizer pressure limit does not apply during:

a. THERMAL POWER ramp > 5% RTP per minute, or

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS DNB parameters not within limits.	A.1 Restore RCS DNB parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is ≥ 2185 psig.	12 hours
SR 3.4.1.2	Verify RCS average temperature is ≤ 574.1°F.	12 hours
SR 3.4.1.3	Verify RCS total flow rate is ≥ 193,200 gpm.	12 hours
SR 3.4.1.4	----------------NOTE------------------ Not required to be performed until 24 hours after ≥ 90% RTP. --------------------------------------- Verify by precision heat balance that RCS total flow rate is ≥ 193,200 gpm.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS loop average temperature (T_{avg}) shall be $\geq$ 539°F.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more RCS loops not within limit.	A.1 Be in MODE 3.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify RCS T_{avg} in each loop $\geq$ 539°F.	-----NOTE------ Only required if T_{avg} - T_{ref} deviation, low low T_{avg} alarm not reset and any RCS loop T_{avg} < 545°F --------------- 30 minutes thereafter

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.3 RCS pressure, RCS temperature, and RCS heatup and cooldown rates shall be maintained within the limits specified in the PTLR.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE-------- Required Action A.2 shall be completed whenever this Condition is entered. -------------------- Requirements of LCO not met in MODE 1, 2, 3, or 4.	A.1 Restore parameters to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with RCS pressure < 500 psig.	6 hours 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. --------NOTE-------- Required Action C.2 shall be completed whenever this Condition is entered. -------------------- Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limits. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	----------------NOTE---------------- Only required to be performed during RCS heatup and cooldown operations and inservice leak and hydrostatic testing. ------------------------------------ Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates within limits specified in the PTLR.	30 minutes

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops – MODES 1 and 2

LCO 3.4.4 Two RCS loops shall be OPERABLE and in operation (Four Reactor Coolant Pumps (RCPs)).

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify each RCS loop is in operation.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops – MODES 3, 4, and 5

LCO 3.4.5 At least three Reactor Coolant Pumps (RCPs) shall be operating.

---------------------------NOTES---------------------------

1. All RCPs may be de-energized for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause a reduction of the RCS boron concentration; and

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

2. No RCP shall be started with any RCS cold leg temperature ≤ [275]°F unless the secondary side water temperature of each steam generator (SG) is ≤ [50]°F above each of the RCS cold leg temperatures.

APPLICABILITY: MODES 3, 4 and 5, whenever the reactor trip breakers are closed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Less than three RCPs operating.	A.1 Restore at least three RCPs to operating condition. OR A.2 Open the reactor trip breakers.	1 hour 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify at least three RCPs are operating.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 Pressurizer

LCO 3.4.6 The pressurizer water level shall be $\leq$ 92% of span.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Restore pressurizer water level within limit.	6 hours
	OR	
	A.2.1 Be in MODE 3 with reactor trip breakers open.	6 hours
	AND	
	A.2.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify pressurizer water level $\leq$ 92% of span.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 Pressurizer Safety Valves

LCO 3.4.7 Two pressurizer safety valves shall be OPERABLE with lift settings ≥ 2460 psig and ≤ 2510 psig.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with RNS isolated or RCS temperature ≥ 275°F.

--------------------------NOTE--------------------------
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions.

This exception is allowed for 36 hours following entry into MODE 3, provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. OR Two pressurizer safety valves inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with RNS aligned to the RCS and RCS temperature < 275°F.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify each pressurizer safety valve OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within ±1%.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Operational LEAKAGE

LCO 3.4.8 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE

b. 0.5 gpm unidentified LEAKAGE,

c. 10 gpm identified LEAKAGE from the RCS,

d. 1000 gallons per day total primary to secondary LEAKAGE through both steam generators (SGs),

e. 500 gallons per day primary to secondary LEAKAGE through any one SG, and

f. 500 gallons per day primary to IRWST LEAKAGE through the passive residual heat removal heat exchanger (PRHR HX).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time not met. OR Pressure boundary LEAKAGE exists.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.8.1	----------------NOTE----------------- Not required to be performed in MODES 3 and 4 until 12 hours of steady state operation. -------------------------------------- Perform a RCS water inventory balance.	-----NOTE----- Only required to be performed during steady state operation. ------------- 72 hours
SR 3.4.8.2	Verify steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	In accordance with the Steam Generator Tube Surveillance Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Minimum RCS Flow

LCO 3.4.9 At least one Reactor Coolant Pump (RCP) shall be in operation.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. No RCP in operation.	A.1 Isolate all sources of unborated water.	1 hour
	AND	
	A.2 Perform SR 3.1.1.1, (SDM verification).	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify that at least one RCP is in operation.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 RCS Leakage Detection Instrumentation

LCO 3.4.10 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump level channel;

b. One containment atmosphere radioactivity monitor (gaseous N13/F18).

---------------------------NOTE---------------------------
The N13/F18 containment atmosphere radioactivity monitor is only required to be OPERABLE in MODE 1 with RTP > 20%.

APPLICABILITY: MODES 1, 2, 3, and 4.

---------------------------NOTE---------------------------
Containment sump level measurements cannot be used for leak detection if leakage is prevented from draining to the sump such as by redirection to the IRWST by the containment shell gutter drains.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two containment sump channels inoperable.	A.1 Perform SR 3.4.8.1 (RCS inventory balance).	Once per 24 hours
	<u>AND</u>	
	A.2 Restore one containment sump channel to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	------------NOTE------------ LCO 3.0.4 is not applicable. ----------------------------	
	B.1.1 Analyze grab samples of containment atmosphere.	Once per 24 hours
	OR	
	B.1.2 Perform SR 3.4.8.1.	Once per 24 hours
	AND	
	B.2 Restore containment atmosphere radioactivity monitor to OPERABLE status.	30 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	AND	
	C.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Perform a CHANNEL CHECK of required containment atmosphere radioactivity monitor.	12 hours
SR 3.4.10.2	Perform a COT of required containment atmosphere radioactivity monitor.	92 days
SR 3.4.10.3	Perform a CHANNEL CALIBRATION of required containment sump monitor.	24 months
SR 3.4.10.4	Perform a CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 RCS Specific Activity

LCO 3.4.11 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) $\geq$ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 0.4 μCi/gm.	-------------NOTE------------ LCO 3.0.4 is not applicable. -----------------------------	
	A.1 Verify DOSE EQUIVALENT I-131 to be $\leq$ 24 μCi/gm.	Once per 4 hours
	<u>AND</u>	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. DOSE EQUIVALENT XE-133 > 150 μCi/gm.	B.1 Perform SR 3.4.11.2.	4 hours
	<u>AND</u>	
	B.2 Be in MODE 3 with T_{avg} < 500°F.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met. <u>OR</u> DOSE EQUIVALENT I-131 > 24 μCi/gm.	C.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 150 μCi/gm.	7 days
SR 3.4.11.2	-----------------NOTE----------------- Only required to be performed in MODE 1. -------------------------------------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 0.4 μCi/gm.	14 days <u>AND</u> Between 2 to 6 hours after a THERMAL POWER change of ≥ 15% of RTP within a 1 hour period

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Automatic Depressurization System (ADS) – Operating

LCO 3.4.12 The ADS, including 10 flow paths, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One flow path inoperable. OR One stage 1 ADS flow path inoperable and one stage 2 ADS flow path inoperable. OR One stage 1 ADS flow path inoperable and one stage 3 ADS flow path inoperable.	A.1 Restore flow path(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met. OR Requirements of LCO not met for reasons other than Condition A.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify that the motor operated valve in series with each 4th stage ADS valve is fully open.	12 hours
SR 3.4.12.2	Verify that each stage 1, 2, and 3 ADS valve is OPERABLE by stroking them open.	In accordance with the Inservice Testing Program
SR 3.4.12.3	Verify that each stage 4 ADS valve is OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 Automatic Depressurization System (ADS) – Shutdown, RCS Intact

LCO 3.4.13 The ADS, including 9 flow paths, shall be OPERABLE.

APPLICABILITY: MODE 5 with RCS pressure boundary intact.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required flow path inoperable. OR One required stage 1 ADS flow path and one required stage 2 or stage 3 ADS flow path inoperable.	A.1 Restore flow path(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met. OR Requirements of LCO not met for reasons other than Condition A.	B.1 Initiate action to be in MODE 5, with RCS open and ≥ 20% pressurizer level.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	For flow paths required to be OPERABLE, the SRs of LCO 3.4.12, "Automatic Depressurization System (ADS) – Operating" are applicable.	In accordance with applicable SRs

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 Automatic Depressurization System (ADS) – Shutdown, RCS Open

LCO 3.4.14 ADS stage 1, 2, and 3, flow paths shall be open.
ADS stage 4 with 2 flow paths shall be OPERABLE.

--------------------------NOTE--------------------------
In MODE 5, the ADS valves may be closed to facilitate RCS vacuum fill operations to establish a pressurizer level ≥ 20%, provided ADS valve OPERABILITY meets LCO 3.4.13, ADS – Shutdown, RCS Intact.

APPLICABILITY: MODE 5 with RCS pressure boundary open or pressurizer level < 20%;
MODE 6 with upper internals in place.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ADS stage 1, 2, or 3 flow path closed.	A.1 Open the affected flow path.	72 hours
	<u>OR</u>	
	A.2 Open an alternative flow path with an equivalent area.	72 hours
B. One required ADS stage 4 flow path closed and inoperable.	B.1 Open an alternative flow path with an equivalent area.	36 hours
	<u>OR</u>	
	B.2 Restore two ADS stage 4 flow paths to OPERABLE status.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met while in MODE 5. OR Requirements of LCO not met for reasons other than Conditions A or B while in MODE 5.	C.1 Initiate action to fill the RCS to establish $\geq$ 20% pressurizer level. AND C.2 Suspend positive reactivity additions.	Immediately Immediately
D. Required Action and associated Completion Time not met while in MODE 6. OR Requirements of LCO not met for reasons other than Conditions A or B while in MODE 6.	D.1 Initiate action to remove the upper internals. AND D.2 Suspend positive reactivity additions.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	Verify that each ADS stage 1,2, and 3 valve is in the fully open position.	12 hours
SR 3.4.14.2	For each ADS stage 4 flow path required to be OPERABLE, the following SRs of LCO 3.4.12, "Automatic Depressurization System (ADS) – Operating" are applicable: SR 3.4.12.1 SR 3.4.12.3	In accordance with applicable SRs

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.15 At least one of the following Overpressure Protection Systems shall be OPERABLE, with the accumulators isolated:

a. The Normal Residual Heat Removal System (RNS) suction relief valve, or

b. The RCS depressurized and an RCS vent of ≥ [5.4] square inches.

------------------------------NOTE------------------------------
When the RCS temperature is ≥ 200°F, a reactor coolant pump (RCP) may not be started if the pressurizer level is ≥ 92%.

APPLICABILITY: MODE 4 when all cold leg temperatures are ≤ 275°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

------------------------------NOTE------------------------------
Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. An accumulator not isolated when the accumulator pressure is ≥ to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	A.1 Isolate affected accumulator.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	Increase RCS cold leg temperature to a level acceptable for the existing accumulator pressure allowed in the PTLR.	12 hours
	OR		
	B.2	Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	12 hours
C. The RNS suction relief valve inoperable.	C.1	Restore the RNS suction relief valve to OPERABLE status.	8 hours
	OR		
	C.2	Depressurize RCS and establish RCS vent of $\geq$ [5.4] square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Verify each accumulator is isolated.	12 hours
SR 3.4.15.2	Verify both RNS suction isolation valves in one RNS suction flow path are open.	12 hours
SR 3.4.15.3	-----------------NOTE----------------- Only required to be performed when complying with LCO 3.4.15.b. -------------------------------------- Verify RCS vent $\geq$ [5.4] square inches is open: a. For unlocked-open vent b. For locked-open vent	 12 hours 31 days
SR 3.4.15.4	Verify the lift setting of the RNS suction relief valve.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Pressure Isolation Valve (PIV) Integrity

LCO 3.4.16 Leakage from each RCS PIV shall be within limit.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4, with the RCS not being cooled by the RNS.

ACTIONS

------------------------------------NOTES------------------------------------

1. Separate Condition entry is allowed for each flow path.

2. Enter applicable Conditions and Required Actions for systems made inoperable by an inoperable PIV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Leakage from one or more RCS PIVs not within limit.	------------NOTE------------ Each valve used to satisfy Required Action A.1 and Required Action A.2 must have been verified to meet SR 3.4.16.1 and be in the reactor coolant pressure boundary or the high pressure portion of the system. ----------------------------	
	A.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of one closed manual, deactivated automatic, or check valve.	8 hours
	<u>AND</u>	
	A.2 Verify a second operable PIV can meet the leakage limits. This valve is required to be a check valve, or a closed valve, if it isolates a line that penetrates containment.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify LEAKAGE of each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch valve size up to a maximum of 5 gpm at an RCS pressure ≥ [2215] and ≤ [2255] psig.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 Reactor Vessel Head Vent (RVHV)

LCO 3.4.17 The Reactor Vessel Head Vent shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with the RCS not being cooled by the RNS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. Two flow paths inoperable.	B.1 Restore at least one flow path to OPERABLE status.	6 hours
C. Required Action and associated Completion Time not met. OR Requirements of LCO not met for reasons other than Conditions A or B.	C.1 Be in MODE 3. AND C.2 Be in MODE 4, with the RCS cooling provided by the RNS.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.17.1 Verify that each RVHV valve is OPERABLE by stroking them open.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.18 Chemical and Volume Control System (CVS) Makeup Isolation Valves

LCO 3.4.18 Two CVS Makeup Isolation Valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CVS makeup isolation valve inoperable.	A.1 Restore two CVS makeup isolation valves to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition not met. OR Two CVS makeup isolation valves inoperable.	------------NOTE------------ Flow path(s) may be unisolated intermittently under administrative controls. ---------------------------- B.1 Isolate the flow path from the CVS makeup pumps to the Reactor Coolant System by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.18.1	Verify two CVS makeup isolation valves are OPERABLE by stroking the valve closed.	In accordance with the Inservice Testing Program
SR 3.4.18.2	Verify closure time of each CVS makeup isolation valve is $\leq$ 10 seconds on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.1 Accumulators

LCO 3.5.1 Both accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3 and 4 with pressurizer pressure > 1000 psig.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One accumulator inoperable due to boron concentration outside limits.	A.1 Restore boron concentration to within limits.	72 hours
B. One accumulator inoperable for reasons other than Condition A.	B.1 Restore accumulator to OPERABLE status.	8 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3 AND C.2 Reduce pressurizer pressure $\leq$ 1000 psig.	6 hours 12 hours
D. Two accumulators inoperable for reasons other than Condition C.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify the borated water volume in each accumulator is $\geq$ 1667 cu. ft., and $\leq$ 1732 cu. ft.	12 hours
SR 3.5.1.3	Verify the nitrogen cover gas pressure in each accumulator is $\geq$ 637 psig and $\leq$ 769 psig.	12 hours
SR 3.5.1.4	Verify the boron concentration in each accumulator is $\geq$ 2600 ppm and $\leq$ 2900 ppm.	31 days AND -----NOTE--- Only required for affected accumulators. ----------- Once within 6 hours after each solution volume increase of $\geq$ 51 cu. ft., 3.0 %

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when pressurizer pressure is ≥ 2000 psig.	31 days
SR 3.5.1.6	Verify system flow performance of each accumulator in accordance with the System Level Operability Testing Program.	10 years

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.2 Core Makeup Tanks (CMTs) – Operating

LCO 3.5.2 Both CMTs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4 with the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CMT outlet isolation valve inoperable.	A.1 Restore outlet isolation valve to OPERABLE status.	72 hours
B. One CMT inoperable due to water temperature or boron concentration not within limits.	B.1 Restore water temperature or boron concentration to within limits.	72 hours
C. Two CMTs inoperable due to water temperature or boron concentration not within limits.	C.1 Restore water temperature or boron concentration to within limits for one CMT.	8 hours
D. Presence of non-condensible gases in one high point vent.	D.1 Vent non-condensible gases.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. CMT inoperable for reasons other than Condition A, B, C, or D.	E.1 Restore CMT to OPERABLE status.	8 hours
F. Required Action or associated Completion Time of Condition A, B, C, D, or E not met. OR LCO not met for reasons other than A, B, C, D, or E.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the temperature of the borated water in each CMT is < 120°F.	24 hours
SR 3.5.2.2	Verify the borated water volume in each CMT is ≥ 2000 cu. ft.	7 days
SR 3.5.2.3	Verify each CMT inlet isolation valve is fully open.	12 hours
SR 3.5.2.4	Verify the volume of non-condensible gases in each CMT inlet line is ≤ [0.2] ft^3.	24 hours
SR 3.5.2.5	Verify the boron concentration in each CMT is ≥ 3400 ppm, and ≤ 3700 ppm.	7 days
SR 3.5.2.6	Verify each CMT outlet isolation valve is OPERABLE by stroking it open.	In accordance with the Inservice Testing Program
SR 3.5.2.7	Verify system flow performance of each CMT in accordance with the System Level Operability Testing Program.	10 years

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.3 Core Makeup Tanks (CMTs) - Shutdown, RCS Intact

LCO 3.5.3 One CMT shall be OPERABLE.

APPLICABILITY: MODE 4 with the RCS cooling provided by the Normal Residual Heat Removal System (RNS),
MODE 5 with the RCS pressure boundary intact.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required outlet isolation valve inoperable.	A.1 Restore required isolation valve to OPERABLE status.	72 hours
B. Required CMT inoperable due to water temperature or boron concentration not within limits.	B.1 Restore water temperature or boron concentration to within limits.	72 hours
C. Required CMT inoperable for reasons other than A or B.	C.1 Restore required CMT to OPERABLE status.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action or associated Completion Time of Conditions A, B, or C not met. <u>OR</u> LCO not met for reasons other than A, B, or C.	D.1 Initiate action to be in MODE 5 with RCS pressure boundary open and $\geq$ 20% pressurizer level.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	For the CMT required to be OPERABLE, the SRs of Specification 3.5.2, Core Makeup Tanks (CMTs) – Operating" are applicable.	In accordance with applicable SRs

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.4 Passive Residual Heat Removal Heat Exchanger (PRHR HX) – Operating

LCO 3.5.4 The PRHR HX shall be OPERABLE.

-----------------------------NOTE-----------------------------
When any reactor coolant pumps (RCPs) are operating, at least one RCP must be operating in the loop with the PRHR HX, Loop 1.

APPLICABILITY: MODES 1, 2, 3, and 4 with the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One air operated outlet isolation valve inoperable.	A.1 Restore air operated outlet isolation valve to OPERABLE status.	72 hours
B. One air operated IRWST gutter isolation valve inoperable.	B.1 Restore air operated IRWST gutter isolation valve to OPERABLE status.	72 hours
C. Presence of non-condensible gases in the high point vent.	C.1 Vent non-condensible gases.	24 hours
D. Required Actions of Conditions A, B, or C not met within the required Completion Times.	D.1 Be in MODE 3. AND D.2 Be in MODE 4 with the RCS cooling provided by the RNS.	6 hours 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. LCO not met for reasons other than A, B, or C.	E.1	Restore PRHR HX to OPERABLE status.	8 hours
F. Required Action and associated Completion Time for Condition E not met.	F.1	----------NOTE---------- Prior to initiating actions to change to a lower MODE, verify that redundant means of providing SG feedwater are OPERABLE. If redundant means are not OPERABLE, suspend LCO 3.0.3 and all other LCO Required Actions requiring MODE changes until redundant means are restored to OPERABLE status. ------------------------	
		Be in MODE 3.	6 hours
	<u>AND</u>		
	F.2	----------NOTE---------- Prior to stopping the SG feedwater, verify that redundant means of cooling the RCS to cold shutdown conditions are OPERABLE. If redundant means are not OPERABLE, suspend LCO 3.0.3 and all other LCO Required Actions requiring MODE changes until redundant means are restored to OPERABLE status. ------------------------	
		Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	Verify the outlet manual isolation valve is fully open.	12 hours
SR 3.5.4.2	Verify the inlet motor operated isolation valve is open.	12 hours
SR 3.5.4.3	Verify the volume of noncondensible gases in the PRHR HX inlet line is $\leq$ [0.4] ft^3.	24 hours
SR 3.5.4.4	Verify both PRHR air operated outlet isolation valves and both IRWST gutter isolation valves are OPERABLE by stroking open the valves.	In accordance with the System Level Inservice Testing Program
SR 3.5.4.5	Verify PRHR HX heat transfer performance in accordance with the System Level Operability Testing Program.	10 years
SR 3.5.4.6	Verify by visual inspection that the IRWST gutters are not restricted by debris.	24 months

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.5 Passive Residual Heat Removal Heat Exchanger (PRHR HX) – Shutdown, RCS Intact

LCO 3.5.5 The PRHR HX shall be OPERABLE.

--------------------------NOTE--------------------------
When any reactor coolant pumps (RCPs) are operating, at least one RCP must be operating in loop one.

APPLICABILITY: MODE 4 with the RCS cooling provided by the Normal Residual Heat Removal System (RNS),
MODE 5 with the RCS pressure boundary intact.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One air operated outlet isolation valve inoperable.	A.1 Restore air operated outlet valve to OPERABLE status.	72 hours
B. One air operated IRWST gutter isolation valve inoperable.	B.1 Restore air operated IRWST gutter isolation valve to OPERABLE status.	72 hours
C. Presence of non-condensible gases in the high point vent.	C.1 Vent noncondensible gases.	24 hours
D. PRHR HX inoperable for reasons other than A, B, or C.	D.1 Restore PRHR HX to OPERABLE status.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Actions of Conditions A, B, C, or D not met within the required Completion Times. <u>OR</u> LCO not met for reasons other than A, B, C, or D.	E.1 Initiate action to be in MODE 5 with the RCS pressure boundary open and > 20% pressurizer level.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	The SRs of Specification 3.5.4, "Passive Residual Heat Removal Heat Exchanger (PRHR HX) – Operating" are applicable.	In accordance with applicable SRs

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.6 In-containment Refueling Water Storage Tank (IRWST) – Operating

LCO 3.5.6 The IRWST, with two injection flow paths and two containment recirculation flow paths, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One motor operated containment recirculation isolation valve inoperable.	A.1 Restore containment recirculation motor operated isolation valve to OPERABLE status.	72 hours
B. One motor operated containment recirculation isolation valve not fully closed.	B.1 Close motor operated containment recirculation isolation valve.	72 hours
C. IRWST boron concentration or water temperature not within limits. OR IRWST water volume <100% and >97% of limit.	C.1 Restore IRWST to OPERABLE status.	8 hours
D. One motor operated IRWST isolation valve not fully open.	D.1 Restore motor operated IRWST isolation valve to fully open condition.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Actions and associated Completion Times of Conditions A B, C, or D not met. OR LCO not met for reasons other than A, B, C, or D.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	Verify the IRWST water temperature is < 120°F.	24 hours
SR 3.5.6.2	Verify the IRWST borated water volume is > [70,000] cu. ft.	24 hours
SR 3.5.6.3	Verify the IRWST boron concentration is $\geq$ 2600 ppm and $\leq$ 2900 ppm.	31 days AND Once within 6 hours after each solution volume increase of 15,000 gal., 3.0%

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.6.4	Verify each motor operated IRWST isolation valve is fully open.	12 hours
SR 3.5.6.5	Verify power is removed from each motor operated IRWST isolation valve.	31 days
SR 3.5.6.6	Verify each containment recirculation isolation valve is fully closed.	31 days
SR 3.5.6.7	Verify each motor operated containment recirculation isolation valve is OPERABLE by stroking open the valve.	In accordance with the Inservice Testing Program
SR 3.5.6.8	Verify each IRWST injection and containment recirculation squib valve is OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program
SR 3.5.6.9	Verify by visual inspection that the IRWST screens and the containment recirculation screens are not restricted by debris.	24 months
SR 3.5.6.10	Verify IRWST injection and recirculation system flow performance in accordance with the System Level Operability Testing Program.	10 years

3.5 PASSIVE CORE COOLING SYSTEM (PXS)

3.5.7 In-containment Refueling Water Storage Tank (IRWST) – Shutdown, MODE 5

LCO 3.5.7 The IRWST, with one injection flow path and one containment recirculation flow path, shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required motor operated containment recirculation isolation valve inoperable.	A.1 Restore required motor operated containment recirculation isolation valve to OPERABLE status.	72 hours
B. Required motor operated containment recirculation isolation valve not fully closed.	B.1 Close required motor operated containment recirculation isolation valve.	72 hours
C. IRWST boron concentration or water temperature not within limits. <u>OR</u> IRWST water volume < 100% and > 97% of limit.	C.1 Restore IRWST to OPERABLE status.	8 hours
D. Required motor operated IRWST isolation valve not fully open.	D.1 Restore required motor operated IRWST isolation valve to fully open condition.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Actions and associated Completion Times of Conditions A B, C, or D not met.	E.1 Initiate action to be in MODE 5 with the RCS pressure boundary intact and ≥ 20% pressurizer level.	Immediately
<u>OR</u>	<u>AND</u>	
LCO not met for reasons other than A, B, C, or D.	E.2 Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.7.1	For the IRWST and flow paths required to be OPERABLE, the SRs of Specification 3.5.6, "In-containment Refueling Water Storage Tank (IRWST) – Operating" are applicable.	In accordance with applicable SRs

3.5 PASSIVE CORE COOLING SYSTEMS

3.5.8 In-containment Refueling Water Storage Tank (IRWST) – Shutdown, MODE 6

LCO 3.5.8 The IRWST, with one injection flow path and one containment recirculation flow path, shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required motor operated containment recirculation isolation valve inoperable.	A.1 Restore required motor operated containment recirculation isolation valve to OPERABLE status.	72 hours
B. Required motor operated containment recirculation isolation valve not fully closed.	B.1 Close required motor operated containment recirculation isolation valve.	72 hours
C. IRWST and refueling cavity boron concentration or water temperature not within limits. <u>OR</u> IRWST and refueling cavity water volume < 100% and > 97% of limit.	C.1 Restore IRWST to OPERABLE status.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required motor operated IRWST isolation valve not fully open.	D.1 Restore required motor operated IRWST isolation valve to fully open condition.	1 hour
E. Required Actions and associated Completion Times of Conditions A B, C, or D not met. <u>OR</u> LCO not met for reasons other than A, B, C, or D.	E.1 Initiate action to be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange. <u>AND</u> E.2 Suspend positive reactivity additions.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.8.1	Verify the IRWST and refueling cavity water temperature is < 120°F.	24 hours
SR 3.5.8.2	Verify the IRWST and refueling cavity water total borated water volume is > [70,000] cu. ft.	24 hours
SR 3.5.8.3	Verify the IRWST and refueling cavity boron concentration is ≥ 2600 ppm and ≤ 2900 ppm.	31 days AND Once within 6 hours after each solution volume increase of 15,000 gal., 3.0%
SR 3.5.8.4	For the IRWST and flow paths required to be OPERABLE, the following SRs of Specification 3.5.6, "In-containment Refueling Water Storage Tank (IRWST) – Operating" are applicable: SR 3.5.6.4 SR 3.5.6.6 SR 3.5.6.8 SR 3.5.6.5 SR 3.5.6.7 SR 3.5.6.9	In accordance with applicable SRs

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment inoperable.	A.1 Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage-rate testing except for containment air-lock testing, in accordance with the Containment Leakage Rate Testing Program.	----NOTE---- SR 3.0.2 is not applicable ------------ In accordance with the Containment Leakage Rate Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Locks

LCO 3.6.2 Two containment air locks shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

------------------------------------NOTES------------------------------------

1. Entry and exit is permissible to perform repairs on the affected air lock components.
2. Separate Condition entry is allowed for each air lock.
3. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment air locks with one containment air lock door inoperable.	-----------NOTES----------- 1. Required Actions A.1, A.2, and A.3 are not applicable if both doors in the same air lock are inoperable and Condition C is entered. 2. Entry and exit is permissible for 7 days under administrative controls if both air locks are inoperable. --------------------------	
	A.1 Verify the OPERABLE door is closed in the affected air lock.	1 hour
	<u>AND</u>	
	A.2 Lock the OPERABLE door closed in the affected air lock.	24 hours
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	AND A.3 --------NOTE---------- Air lock doors in high radiation areas may be verified locked closed by administrative means. --------------------- Verify the OPERABLE door is locked closed in the affected air lock.	 Once per 31 days
B. One or more containment air locks with containment air lock interlock mechanism inoperable.	----------NOTES------------ 1. Required Actions B.1, B.2, and B.3 are not applicable if both doors in the same air lock are inoperable and Condition C is entered. 2. Entry and exit of containment is permissible under the control of a dedicated individual. ---------------------------- B.1 Verify an OPERABLE door is closed in the affected air lock. AND B.2 Lock an OPERABLE door closed in the affected air lock. AND	 1 hour 24 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 ----------NOTE--------- Air lock doors in high radiation areas may be verified locked closed by administrative means. --------------------- Verify an OPERABLE door is locked closed in the affected air lock.	 Once per 31 days
C. One or more containment air locks inoperable for reasons other than Condition A or B.	C.1 Initiate action to evaluate overall containment leakage rate per LCO 3.6.1 AND C.2 Verify a door is closed in the affected air lock. AND C.3 Restore air lock to OPERABLE status.	Immediately 1 hour 24 hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	----------------NOTES---------------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1. ------------------------------------- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	----------------NOTE---------------- Only required to be performed upon entry or exit through the containment air lock. ------------------------------------- Verify only one door in the air lock can be opened at a time.	184 days

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

------------------------------------NOTES------------------------------------

1. Penetration flow path(s) may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE-------- Only applicable to penetration flow paths with two containment isolation valves. -------------------- One or more penetration flow paths with one containment isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. <u>AND</u> A.2 ---------NOTE--------- Isolation devices in high radiation areas may be verified by use of administrative means. ----------------------	4 hours (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside containment <u>AND</u> Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment
B. --------NOTE-------- Only applicable to penetration flow paths with two containment isolation valves. -------------------- One or more penetration flow paths with two containment isolation valves inoperable.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
C. --------NOTE-------- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. --------------------	C.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued) One or more penetration flow paths with one containment isolation valve inoperable.	AND C.2 --------NOTE--------- Isolation devices in high radiation areas may be verified by use of administrative means. -------------------- Verify that the affected penetration flow path is isolated.	 Once per 31 days
D. Required Action and associated Completion Time not met in MODES 1, 2, 3, and 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each [16 inch] containment purge valve is closed, except when the [16 inch] containment purge valves are open for pressure control, ALARA or air quality considerations for personnel containment entry, or for Surveillances which require the valves to be open.	31 days
SR 3.6.3.2	-----------------NOTE----------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. --------------------------------------- Verify each containment isolation manual valve and blind flange that is located outside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	 31 days
SR 3.6.3.3	-----------------NOTE----------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. --------------------------------------- Verify each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	 Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	Verify the isolation time of each power operated and each automatic containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.5	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be [≥ -0.2 psig and] ≤ +1.0 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	12 hours

Reviewer's Note: The low pressure limit is not needed for plant locations for which the lowest possible ambient temperature is approximately 20°F.

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be $\leq$ 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limit.	A.1 Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	24 hours

3.6 CONTAINMENT SYSTEMS

3.6.6 Passive Containment Cooling System (PCS) – Operating

LCO 3.6.6 The passive containment cooling system shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One passive containment cooling water flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. Water storage tank temperature not within limit. OR Water storage tank volume not within limit.	B.1 Restore water storage tank to OPERABLE status.	8 hours
C. Required Action and associated Completion Time of Conditions A or B. OR LCO not met for reasons other than A or B.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify the water storage tank temperature $\geq$ 40°F and $\leq$ 120°F.	----NOTE---- Only required when the ambient temperature is $\leq$ 32°F or $\geq$ 100°F ------------ 24 hours
SR 3.6.6.2	Verify the water storage tank volume $\geq$ 531,000 gallons.	7 days
SR 3.6.6.3	Verify each passive containment cooling system, power operated, and automatic valve in each flow path that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.6.6.4	Verify each passive containment cooling system automatic valve in each flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.5	Verify the air flow path from the shield building annulus inlet to the exit is unobstructed and, that all air baffle sections are in place.	24 months
SR 3.6.6.6	Verify passive containment cooling system flow and water coverage performance in accordance with the System Level Operability Testing Program.	At first refueling <u>AND</u> 10 years

3.6 CONTAINMENT SYSTEMS

3.6.7 Passive Containment Cooling System (PCS) – Shutdown

LCO 3.6.7 The passive containment cooling system shall be OPERABLE.

APPLICABILITY: MODE 5 with the calculated reactor decay heat > 6.0 MWt,
MODE 6 with the calculated reactor decay heat > 6.0 MWt.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One passive containment cooling water flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. Water storage tank temperature not within limit. OR Water storage tank volume not within limit.	B.1 Restore water storage tank to OPERABLE status.	8 hours

(continued)

ACTIONS (continued)

C. Required Action and associated Completion Time of Conditions A or B not met. OR LCO not met for reasons other than A or B.	C.1.1 If in MODE 5, initiate action to be in MODE 5 with the RCS pressure boundary intact and ≥ 20% pressurizer level. OR C.1.2 If in MODE 6, initiate action to be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange. AND C.2 Suspend positive reactivity additions.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	The SRs of Specification 3.6.6, "Passive Containment Cooling System – Operating" are applicable.	In accordance with applicable SRs

3.6 CONTAINMENT SYSTEMS

3.6.8 Containment Penetrations

LCO 3.6.8 The containment penetrations shall be in the following status:

a. The equipment hatches closed and held in place by [four] bolts or, if open, clear of obstructions such that the hatches can be closed prior to steaming into the containment.

b. One door in each air lock closed or, if open, the containment air locks shall be clear of obstructions such that they can be closed prior to steaming into the containment.

c. The containment spare penetrations, if open, shall be clear of obstructions such that the penetrations can be closed prior to steaming into the containment.

d. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Isolation signal.

APPLICABILITY: MODES 5 and 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Restore containment penetrations to required status.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met. OR LCO not met for reasons other than Condition A.	B.1.1 If in MODE 5, initiate action to be in MODE 5 with the RCS pressure boundary intact and $\geq$ 20% pressurizer level.	Immediately
	OR	
	B.1.2 If in MODE 6, initiate action to be in MODE 6 with the water level $\geq$ 23 feet above the top of the reactor vessel flange.	Immediately
	AND	
	B.2 Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.8.1	Verify each required containment penetration is in the required status.	7 days
SR 3.6.8.2	----------------NOTE----------------- Only required to be met for an open equipment hatch. -- Verify that the hardware, tools, equipment and power source necessary to install the equipment hatch are available.	Prior to hatch removal <u>AND</u> 7 days
SR 3.6.8.3	Verify one automatic isolation valve in each open penetration providing direct access from the containment atmosphere to the outside atmosphere actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.9 pH Adjustment

LCO 3.6.9 The pH adjustment baskets shall contain ≥ [240 ft^3] of trisodium phosphate (TSP).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The volume of trisodium phosphate not within limit.	A.1 Restore volume of trisodium phosphate to within limit.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.9.1	Verify that the pH adjustment baskets contain at least [240 ft^3] of TSP ($Na_3PO_4 \cdot 12\ H_2O$).	24 months
SR 3.6.9.2	Verify that a sample from the pH adjustment baskets provides adequate pH adjustment of the post-accident water.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.10 Passive Autocatalytic Hydrogen Recombiners

LCO 3.6.10 Four passive autocatalytic recombiners (PARs) shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One PAR inoperable.	A.1 ----------NOTE---------- LCO 3.0.4 is not applicable. ------------------------ Restore one PAR to OPERABLE status.	30 days
B. Two or more PARs inoperable.	B.1 Verify by administrative means that the hydrogen control function is maintained. AND B.2 Restore three PARs to OPERABLE status.	1 hour AND Once per 12 hours thereafter 7 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.10.1	Visually examine each PAR enclosure and ensure there is no obstruction or blockage of the inlets or outlets.	24 months
SR 3.6.10.2	Perform a surveillance bench test on a specimen removed from each PAR.	24 months

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 The MSSVs shall be OPERABLE as specified in Table 3.7.1-1 and Table 3.7.1-2.

APPLICABILITY: MODES 1, 2, 3,
MODE 4 with the RCS not being cooled by the RNS.

ACTIONS

------------------------------------ NOTE ------------------------------------
Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required MSSVs inoperable.	A.1 Reduce power to less than or equal to the applicable % RTP listed in Table 3.7.1-1.	4 hours
B. Required Action and associated Completion Time not met. OR One or more steam generators with less than two MSSVs OPERABLE.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with the RCS cooling provided by the RNS.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.1.1	-----NOTE----- Only required to be performed in MODES 1 and 2. ----- Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift settings shall be within ±1%.	In accordance with the Inservice Testing Program

Table 3.7.1-1 (Page 1 of 1)

OPERABLE MSSVs Versus
Applicable Power in Percent of RTP

MINIMUM NUMBER OF MSSVs PER SG REQUIRED OPERABLE	MAXIMUM ALLOWABLE POWER, % RTP
3	100
2	67

Table 3.7.1-2 (Page 1 of 1)
Main Steam Safety Valve Lift Settings

VALVE NUMBER		LIFT SETTING, psig ± 1%
STEAM GENERATOR		
#1	#2	
V030A	V030B	1085
V031A	V031B	1115
V032A	V032B	1140

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

LCO 3.7.2 The minimum combination of valves required for steam flow isolation shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2, 3, and 4 except when steam flow is isolated.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV inoperable in MODE 1.	A.1 Restore valve to OPERABLE status.	8 hours
B. One or more of the turbine stop valves and its associated turbine control valve, turbine bypass valves, or moisture separator reheat supply steam control valve inoperable in MODE 1.	B.1 Restore valve to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two MSIVs inoperable in MODE 1. OR One MSIV inoperable and one or more of the turbine stop valves and its associated turbine control valve, four turbine bypass valves, or moisture separator reheat supply steam control valve inoperable in MODE 1. OR Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 2.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or two MSIVs inoperable in MODE 2, 3, or 4. --------NOTE-------- Separate Condition entry is allowed for each MSIV. ------------------- <u>OR</u> One or more of the turbine stop valves and its associated turbine control valve, four turbine bypass valves, or moisture separator reheat supply steam control valve inoperable in MODE 2, 3, or 4.	D.1 Isolate associated steam flow path. <u>AND</u> D.2 Verify flow path remains closed.	8 hours Once per 7 days
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 3. <u>AND</u> E.2 Be in MODE 4 with the RCS cooling provided by the RNS.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	-----------------NOTE----------------- Only required to be performed prior to entry into MODE 2. --------------------------------------- Verify MSIV closure time $\leq$ 5 seconds on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program
SR 3.7.2.2	-----------------NOTE----------------- Only required to be performed prior to entry into MODE 2. --------------------------------------- Verify turbine stop, turbine control, turbine bypass, and moisture separator reheat supply steam control valves' closure time $\leq$ 5 seconds on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation and Control Valves (MFIV and MFCV)

LCO 3.7.3 The MFIV and the MFCV for each Steam Generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4 except when the MFIVs or associated MFCV are closed and deactivated.

ACTIONS

--NOTE--

Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two MFIVs inoperable.	A.1 Close or isolate the MFIV flow path.	72 hours
	<u>AND</u>	
	A.2 Verify MFIV is closed or isolated.	Once per 7 days
B. One or two MFCVs inoperable.	B.1 Close or isolate the MFCV the flow path.	72 hours
	<u>AND</u>	
	B.2 Verify MFCV is closed or isolated.	Once per 7 days
C. Two valves in the same flow path inoperable.	C.1 Isolate affected flow path.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 4 with the RCS cooling provided by the RNS.	24 hours
	AND	
	D.3.1 Isolate the affected flow path(s).	36 hours
	OR	
	D.3.2 Be in Mode 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	----------------NOTE---------------- Only required to be performed prior to entry into MODE 2. ------------------------------------	
	Verify the closure time of each MFIV and MFCV is ≤ 5 seconds on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.4 Secondary Specific Activity

LCO 3.7.4 The specific activity of the secondary coolant shall be $\leq$ 0.04 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify the specific activity of the secondary coolant $\leq$ 0.04 μCi/gm DOSE EQUIVALENT I-131.	31 days

3.7 PLANT SYSTEMS

3.7.5 Spent Fuel Pool Water Level

LCO 3.7.5 The spent fuel pool water level shall be $\geq$ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ LCO 3.0.3 not applicable. ----------------------------	
A. Spent fuel pool water level < 23 ft.	A.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool.	Immediately
	<u>AND</u>	
	A.2 Initiate action to restore water level to $\geq$ 23 ft.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify the spent fuel pool water level is $\geq$ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days

3.7 PLANT SYSTEMS

3.7.6 Main Control Room Habitability System (VES)

LCO 3.7.6 The Main Control Room (MCR) Habitability System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of irradiated fuel assemblies,
During CORE ALTERATIONS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One VES valve or damper inoperable.	A.1 Restore VES valve or damper to OPERABLE status.	7 days
B. MCR air temperature not within limit.	B.1 Restore MCR air temperature to within limit.	24 hours
C. Loss of integrity of MCR pressure boundary.	C.1 Restore MCR pressure boundary to OPERABLE status	24 hours
D. Required Action and associated Completion Time of Conditions A, B, or C not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Required Action and associated Completion Time of Conditions A, B, or C not met during movement of irradiated fuel or during CORE ALTERATIONS.	E.1 Suspend CORE ALTERATIONS. AND E.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. VES inoperable in MODE 1, 2, 3, or 4.	F.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	F.2 Be in MODE 4.	12 hours
	<u>AND</u>	
	F.3 Restore VES to OPERABLE status.	36 hours
G. VES inoperable during movement of irradiated fuel or during CORE ALTERATIONS.	G.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	G.2 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify Main Control Room air temperature is $\leq$ 75°F.	24 hours
SR 3.7.6.2	Verify that the compressed air storage tanks are pressurized to [$\geq$ 3400 psig].	24 hours
SR 3.7.6.3	Verify that each VES air delivery isolation valve is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.4	Verify that each VES air header manual isolation valve is in an open position.	31 days
SR 3.7.6.5	Verify that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62.	92 days
SR 3.7.6.6	Verify that all VBS Main Control Room isolation valves are OPERABLE and will close upon receipt of an actual or simulated actuation signal.	24 months
SR 3.7.6.7	Verify that each VES pressure relief isolation valve within the MCR pressure boundary is OPERABLE.	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.6.8	Verify that each VES pressure relief damper is OPERABLE.	24 months
SR 3.7.6.9	Verify that the self contained pressure regulating valve in each VES air delivery flow path is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.10	Verify that one VES air delivery flow path maintains a 1/8 inch water gauge positive pressure in the MCR envelope relative to the adjacent areas at the required air addition flow rate of 60 ± 5 scfm using the safety related compressed air emergency air storage tanks.	24 months

3.7 PLANT SYSTEMS

3.7.7 Startup Feedwater Isolation and Control Valves

LCO 3.7.7 Both Startup Feedwater Isolation Valves and Control Valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4 except when the startup feedwater flow paths are isolated.

ACTIONS

------------------------------------NOTE------------------------------------
Flow paths may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with one inoperable valve.	A.1 Restore the valve(s) to OPERABLE status.	72 hours
	<u>OR</u>	
	A.2.1 Isolate the affected flow path(s).	72 hours
	<u>AND</u>	
	A.2.2 Verify affected flow path(s) is isolated	Once per 7 days
B. One flow path with two inoperable valves.	B.1 Isolate the affected flow path.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4 with the RCS cooling provided by the RNS. <u>AND</u> C.3 Isolate the affected flow path(s).	6 hours 24 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify both startup feedwater isolation and control valves are OPERABLE.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.8 Main Steam Line Leakage

LCO 3.7.8 Main Steam Line leakage through the pipe walls inside containment shall be limited to 0.5 gpm.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Main Steam Line leakage exceeds operational limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify main steam line leakage into the containment sump $\leq$ 0.5 gpm.	Per SR 3.4.8.1

3.7 PLANT SYSTEMS

3.7.9 Fuel Storage Pool Makeup Water Sources

LCO 3.7.9 One fuel storage pool makeup water source shall be OPERABLE.

--------------------------NOTES--------------------------

1. OPERABILITY of either the cask washdown pit or the passive containment cooling water source is required when the calculated spent fuel storage pool decay heat $\geq$ 2.15 MWt and $\leq$ 2.77 MWt.
2. OPERABILITY of the passive containment cooling water source is required when the calculated spent fuel storage pool decay heat > 2.77 MWt.

APPLICABILITY: During storage of fuel in the fuel storage pool with a calculated decay heat $\geq$ 2.15 MWt.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ LCO 3.0.3 is not applicable. ----------------------------	
A. Required fuel storage pool makeup water source inoperable.	A.1 Initiate action to restore the required makeup water source to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify the passive containment cooling system water storage tank volume is ≥ 400,000 gallons.	7 days
SR 3.7.9.2	Verify the water level in the cask washdown pit is ≥ 13.75 ft.	30 days
SR 3.7.9.3	Verify the spent fuel storage pool makeup isolation valves PCS-PL-V009, PCS-PL-V045, PCS-PL-V049, PCS-PL-V051, SFS-PL-V066 and SFS-PL-V068 are OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.10 Steam Generator Isolation Valves

LCO 3.7.10 The steam generator isolation valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with the RCS not being cooled by the RNS.

-------------------------NOTES-------------------------

1. Steam generator blowdown flow path(s) may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each flow path.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORV flow paths with one SG isolation valve inoperable.	A.1 Isolate the flow path by use of at least one closed and deactivated automatic valve.	72 hours
B. One or more blowdown flow paths with one SG isolation valve inoperable.	B.1 Isolate the flow path by one closed valve. <u>AND</u> B.2 Verify that the affected SG blowdown flow path is isolated.	72 hours Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more PORV flow paths with two SG isolation valves inoperable.	C.1 Isolate the affected flow path by use of at least one closed and deactivated automatic valve.	8 hours
D. One or more blowdown flow paths with two SG isolation valves inoperable.	D.1 Isolate the flow path by one closed valve.	8 hours
	<u>AND</u>	
	D.2 Verify that the affected SG blowdown flow path is isolated.	Once per 7 days
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	E.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	E.2 Be in MODE 4 with the RCS cooling provided by the RNS.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Verify each steam generator isolation valve (PORV block valves (SGS-PL-V027A & B), PORVs (SGS-PL-V233A & B), and blowdown isolation valves (SGS-PL-V074A & B and SGS-PL-V075A & B)) is OPERABLE by stroking the valve closed.	In accordance with the Inservice Testing Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 DC Sources – Operating

LCO 3.8.1 The Division A, B, C, and D Class 1E DC power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1 Restore DC electrical power subsystem to OPERABLE status.	6 hours
B. Two DC electrical power subsystems inoperable.	B.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify battery terminal voltage is $\geq$ [129] V on float charge.	7 days
SR 3.8.1.2	Verify no visible corrosion at terminals and connectors. <u>OR</u> Verify battery connection resistance is $\leq$ [1E-5] ohm for inter-cell connections, $\leq$ [1E-5] ohm for inter-rack connections, $\leq$ [1E-5] ohm for inter-tier connections, and $\leq$ [1E-5] ohm for terminal connections.	92 days
SR 3.8.1.3	Verify battery cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration.	12 months
SR 3.8.1.4	Remove visible terminal corrosion, verify cell to cell and terminal connections are coated with anti-corrosion material.	12 months
SR 3.8.1.5	Verify battery connection resistance is $\leq$ [1E-5] ohm for inter-cell connections, $\leq$ [1E-5] ohm for inter-rack connections, $\leq$ [1E-5] ohm for inter-tier connections, and $\leq$ [1E-5] ohm for terminal connections.	12 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.6	-----NOTE----- Credit may be taken for unplanned events that satisfy this SR. ----- Verify each battery charger supplies ≥ [400] amps at ≥ [125] V for ≥ [24] hours.	24 months
SR 3.8.1.7	-----NOTES----- 1. The modified performance discharge test in SR 3.8.1.8 may be performed in lieu of the service test in SR 3.8.1.7 once per 60 months. 2. Credit may be taken for unplanned events that satisfy this SR. ----- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.8	-----------------NOTE------------------ Credit may be taken for unplanned events that satisfy this SR. -- Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months <u>AND</u> 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturers rating <u>AND</u> 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturers rating

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 DC Sources – Shutdown

LCO 3.8.2 DC electrical power subsystems shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.6, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required DC electrical power subsystems inoperable.	A.1 Declare affected required features inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate action to suspend operations involving positive reactivity additions. AND A.2.5 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.1.1 SR 3.8.1.4 SR 3.8.1.7 SR 3.8.1.2 SR 3.8.1.5 SR 3.8.1.8 SR 3.8.1.3 SR 3.8.1.6	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 Inverters – Operating

LCO 3.8.3 The Division A, B, C, and D inverters (Divisions A and D, one each and Divisions B and C two each; six total) shall be OPERABLE.

---NOTES---

One inverter may be disconnected from its associated DC bus for ≤ 72 hours to perform an equalizing charge on its associated battery, providing:

1. The associated instrument and control bus is energized from its Class 1E constant voltage source transformer; and

2. All other AC instrument and control buses are energized from their associated OPERABLE inverters.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One inverter inoperable.	A.1 ---NOTE--- Enter applicable Conditions and Required Actions of LCO 3.8.5 "Distribution Systems – Operating" with any instrument and control bus de-energized. --- Restore inverter to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify correct inverter voltage, frequency, and alignment to required AC instrument and control buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 Inverters – Shutdown

LCO 3.8.4 Inverters shall be OPERABLE to support the onsite Class 1E power distribution subsystems required by LCO 3.8.6, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required features inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	A.2.5 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify correct inverter voltage, frequency, and alignments to required AC instrument and control buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 Distribution Systems – Operating

LCO 3.8.5 The Division A, B, C, and D AC and DC instrument and control bus electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Division AC instrument and control bus inoperable.	A.1 Restore AC instrument and control bus to OPERABLE status.	6 hours AND 12 hours from discovery of failure to meet the LCO
B. One Division DC electrical power distribution subsystem inoperable.	B.1 Restore DC electrical power distribution subsystem to OPERABLE status.	6 hours AND 12 hours from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two Divisions AC instrument and control bus inoperable.	C.1 Restore AC instrument and control bus to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet the LCO.
D. Two Divisions DC electrical power distribution subsystem inoperable.	D.1 Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet the LCO.
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours
F. Two Divisions with inoperable distribution subsystems that result in a loss of safety function.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	Verify correct breaker and switch alignments and voltage to required DC and AC instrument and control bus electrical power distribution subsystems.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Distribution Systems – Shutdown

LCO 3.8.6 The necessary portions of DC and AC instrument and control bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required DC or AC instrument and control bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required features inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	
	A.2.4 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.5 Initiate actions to restore required DC and AC instrument and control bus electrical power distribution subsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify correct breaker and switch alignments and voltage to required DC and AC instrument and control bus electrical power distribution subsystems.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Battery Cell Parameters

LCO 3.8.7 Battery Cell Parameters for Division A, B, C, and D batteries shall be within the limits of Table 3.8.7-1.

APPLICABILITY: When associated DC electrical power sources are required to be OPERABLE.

ACTIONS

-------------------------------------NOTE-------------------------------------
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cell parameters not within Category A or B limits	A.1 Verify pilot cells electrolyte level and float voltage meet Table 3.8.7-1 Category C limits.	1 hour
	<u>AND</u>	
	A.2 Verify battery cell parameters meet Table 3.8.7-1 Category C limits.	24 hours <u>AND</u> Once per 7 days thereafter
	<u>AND</u>	
	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.7-1.	31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < [60°F]. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify battery cell parameters meet Table 3.8.7-1 Category A limits.	7 days
SR 3.8.7.2	Verify battery cell parameters meet Table 3.8.7-1 Category B limits.	92 days AND Once within 24 hours after a battery discharge < [110] V AND Once within 24 hours after a battery overcharge > [150] V
SR 3.8.7.3	Verify average electrolyte temperature of representative cells is ≥ [60°F]	92 days

Table 3.8.7-1 (page 1 of 1)
Battery Surveillance Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: ALLOWABLE LIMIT FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark[(a)]	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark[(a)]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts	≥ 2.07 volts
Specific Gravity[(b)(c)]	≥ [TBD]*	≥ [TBD]* AND Average of all connected cells > [TBD]*	Not more than 0.020 below the average of all connected cells AND Average of all connected cells > [TBD]*

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during equalizing charges provided it is not overflowing.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < [TBD]* amps when on float charge.

(c) A battery charging current of < [TBD]* amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of [7] days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the [7 day] allowance.

* To be supplied by battery vendor.

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentration of the Reactor Coolant System (RCS), the fuel transfer canal, and the refueling cavity shall be maintained within the limit specified in Core Operating Limits Report (COLR).

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend positive reactivity additions.	Immediately
	AND	
	A.3 Initiate actions to restore boron concentration to within limits.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	72 hours

3.9 REFUELING OPERATIONS

3.9.2 Unborated Water Source Flow Paths

LCO 3.9.2 Each unborated water source flow path shall be isolated.

APPLICABILITY: MODE 6.

ACTIONS

--NOTE--
Separate condition entry is allowed for each unborated water source flow path.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE-------- Required Action A.3 must be completed whenever Condition A is entered. -------------------- One or more flow paths not isolated.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Initiate actions to isolate flow paths.	Immediately
	AND	
	A.3 Perform SR 3.9.1.1, (boron concentration verification).	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify each unborated water source flow path is isolated by at least one valve secured in the closed position.	31 days

3.9 REFUELING OPERATIONS

3.9.3 Nuclear Instrumentation

LCO 3.9.3 Two source range neutron flux monitors shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required source range neutron flux monitor inoperable.	A.1 Suspend CORE ALTERATIONS. <u>AND</u> A.2 Suspend positive reactivity additions.	Immediately Immediately
B. Two required source range neutron flux monitors inoperable.	B.1 Initiate action to restore one source range neutron flux monitor to OPERABLE status. <u>AND</u> B.2 Perform SR 3.9.1.1, (Boron Concentration Verification).	Immediately 4 hours <u>AND</u> Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Perform a CHANNEL CHECK.	12 hours
SR 3.9.3.2	-----------------NOTE------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -------------------------------------- Perform CHANNEL CALIBRATION.	24 months

3.9 REFUELING OPERATIONS

3.9.4 Refueling Cavity Water Level

LCO 3.9.4 Refueling Cavity Water Level shall be maintained $\geq$ 23 ft. above the top of the reactor vessel flange.

APPLICABILITY: During CORE ALTERATIONS, except during latching and unlatching of control rod drive shafts.
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling cavity water level not within limit.	A.1 Suspend CORE ALTERATIONS	Immediately
	AND	
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately
	AND	
	A.3 Initiate action to restore refueling cavity water level to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify that refueling cavity water level is $\geq$ 23 ft. above the top of reactor vessel flange.	24 hours

3.9 REFUELING OPERATIONS

3.9.5 Containment Penetrations

LCO 3.9.5 The containment penetrations shall be in the following status:

a. The equipment hatches closed and held in place by [four] bolts or, if open, the containment air filtration system (VFS) shall be OPERABLE and operating;

b. One door in each air lock closed or, if open, the VFS shall be OPERABLE and operating;

c. The containment spare penetrations closed or, if open, the VFS shall be OPERABLE and operating;

d. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. Closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. Capable of being closed by an OPERABLE Containment Isolation signal.

APPLICABILITY: During CORE ALTERATIONS
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Suspend CORE ALTERATIONS. <u>AND</u> A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.5.2	Verify each required containment purge and exhaust valve actuates to the isolation position on a manual actuation signal.	In accordance with the Inservice Test Program
SR 3.9.5.3	Verify the VFS can maintain a negative pressure ($\leq$ [-0.125] inches water gauge relative to outside atmospheric pressure) in the area enclosed by the containment and alternate barrier.	24 months
SR 3.9.5.4	Operate each VFS train for $\geq$ 10 continuous hours with the heaters operating.	Within 31 days prior to fuel movement or core alterations

3.9 REFUELING OPERATIONS

3.9.6 Containment Air Filtration System (VFS)

LCO 3.9.6 One VFS exhaust subsystem shall be OPERABLE.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required VFS exhaust subsystem inoperable.	A.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Operate each VFS exhaust subsystem for ≥ 10 continuous hours with the heaters operating.	Within 31 days prior to fuel movement
SR 3.9.6.2	Verify the VAS fuel handling area subsystem aligns to the VFS exhaust subsystem on an actual or simulated actuation signal.	24 months
SR 3.9.6.3	Verify one VFS exhaust subsystem can maintain a negative pressure (≤ [-0.125] inches water gauge relative to outside atmospheric pressure) in the fuel handling area.	24 months

4.0 DESIGN FEATURES

4.1 Site

[Not applicable to AP600 Design Certification. Site specific information to be provided by COL Applicant.]

4.1.1 Site and Exclusion Boundaries

[This information will be provided by the combined license applicant.]

4.1.2 Low Population Zone (LPZ)

[This information will be provided by the combined license applicant.]

4.2 Reactor Core

4.2.1 Fuel Assemblies

The reactor shall contain 145 fuel assemblies. Each assembly shall consist of a matrix of fuel rods clad with a zirconium based alloy and containing an initial composition of natural or slightly enriched uranium dioxide (UO_2) as fuel material. Limited substitutions of zirconium based alloy or stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

4.2.2 Control Rod and Gray Rod Assemblies

The reactor core shall contain 45 Rod Cluster Control Assemblies (RCCAs), each with 24 rodlets/RCCA. The RCCA absorber material shall be silver indium cadmium as approved by the NRC.

Additionally, there are 16 low worth Gray Rod Cluster Assemblies (GRCAs), with 24 rodlets/GRCA, which, in conjunction with the RCCAs, are used to augment MSHIM load follow operation.

(continued)

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent.

b. k_{eff} no greater than 0.95 if fully flooded with unborated water which includes an allowance for uncertainties as described in Section 9.1, "Fuel Storage and Handling."

c. A nominal [10.90 inch] center-to-center distance between fuel assemblies placed in the spent fuel storage racks.

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent.

b. k_{eff} no greater than 0.95 if fully flooded with unborated water which includes an allowance for uncertainties as described in Section 9.1, "Fuel Storage and Handling."

c. k_{eff} no greater than 0.98 if moderated by aqueous foam which includes an allowance for uncertainties as described in Section 9.1, "Fuel Storage and Handling."

d. A nominal [10.90] inch center-to-center distance between fuel assemblies placed in the new fuel storage racks.

4.3.2 Drainage

The spent fuel pool is designed to prevent inadvertent draining and to maintain a minimum water depth of $\geq$ 23 ft. above the surface of the fuel storage racks.

4.3.3 Capacity

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than [616] fuel assemblies.

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

5.1.1 The [Plant Manager] shall be responsible for overall unit operations and shall delegate in writing the succession to this responsibility during his absence.

The [Plant Manager] or his designee shall approve, prior to implementation, each proposed test, experiment or modification to systems or equipment that affect nuclear safety.

5.1.2 The [Shift Supervisor (SS)] shall be responsible for the control room command function. During any absence of the [SS] from the control room while the unit is in MODE 1, 2, 3, or 4, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function. During any absence of the [SS] from the control room while the unit is in MODE 5 or 6, an individual with an active SRO license or Reactor Operator license shall be designated to assume the control room command function.

5.0 ADMINISTRATIVE CONTROLS

5.2 Organization

5.2.1 Organizations

Onsite and offsite organizations shall be established for unit operation and corporate management, respectively. The onsite and offsite organizations shall include the positions for activities affecting safety of the nuclear power plant.

a. Lines of authority, responsibility, and communication shall be defined and established throughout highest management levels, intermediate levels, and all operating organization positions. These relationships shall be documented and updated, as appropriate, in organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation. These requirements shall be documented in the [FSAR];

b. The [Plant Manager] shall be responsible for overall safe operation of the plant and shall have control over those onsite activities necessary for safe operation and maintenance of the plant;

c. The [a specified corporate executive position] shall have corporate responsibility for overall plant nuclear safety and shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to the plant to ensure nuclear safety; and

d. The individuals who train the operating staff, carry out health physics, or perform quality assurance functions may report to the appropriate onsite manager; however, these individuals shall have sufficient organizational freedom to ensure their independence from operation pressures.

5.2.2 Unit Staff

[Reviewer's Note: Determination of the unit staff positions, numbers, and qualifications are the responsibility of the COL applicant. Input provided in WCAP-14694, Revision 0, for the MCR staff and WCAP-14655, Revision 1, for other than the MCR staff will be used in the determination. Each of the following paragraphs may need to be corrected to specify the plant staffing requirements.]

(continued)

5.2 Organization

5.2.2 Unit Staff (continued)

The unit staff organization shall include the following:

a. A non-licensed operator shall be assigned to each reactor containing fuel and an additional non-licensed operator shall be assigned for each control room from which a reactor is operating in MODE 1, 2, 3, or 4.

b. At least one licensed Reactor Operator (RO) shall be present in the control room when fuel is in the reactor. In addition, while the unit is in MODE 1, 2, 3, or 4, at least one licensed Senior Reactor Operator (SRO) shall be present in the control room.

c. Shift Crew Composition may be less than the minimum requirement of 10 CFR 50.54(m)(2)(i) and 5.2.2.a and 5.2.2.g for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements.

d. A [Health Physics Technician] shall be on site when fuel is in the reactor. The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.

e. Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety related functions (e.g., licensed SROs, licensed ROs, health physicists, auxiliary operators, and key maintenance personnel).

   Adequate shift coverage shall be maintained without routine heavy use of overtime. The objective shall be to have operating personnel work an [8 or 12] hour day, nominal 40 hour week while the unit is operating. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance, or major plant modification, on a temporary basis the following guidelines shall be followed:

   1. An individual should not be permitted to work more than 16 hours straight, excluding shift turnover time;

(continued)

5.2 Organization

5.2.2 Unit Staff (continued)

2. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period, nor more than 72 hours in any 7 day period, all excluding shift turnover time;

3. A break of at least 8 hours should be allowed between work periods, including shift turnover time;

4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized in advance by the [Plant Manager] or his designee, in accordance with approved administrative procedures, or by higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation.

Controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the [Plant Manager] or his designee to ensure that excessive hours have not been assigned. Routine deviation for the above guidelines is not authorized.

f. The [Operations Manager or Assistant Operations Manager] shall hold an SRO license.

g. The Shift Technical Advisor (STA) shall provide advisory technical support to the Shift Supervisor (SS) in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit. In addition, the STA shall meet the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift. One of the SROs on shift may perform the functions of the STA provided that this individual has the specified engineering expertise.

5.0 ADMINISTRATIVE CONTROLS

5.3 Unit Staff Qualifications

[Reviewer's Note: Minimum qualifications for members of the unit staff shall be specified by use of an overall qualification statement referencing an ANSI Standard acceptable to the NRC staff or by specifying individual position qualifications. Generally, the first method is preferable; however, the second method is adaptable to those unit staffs requiring special qualification statements because of unique organizational structures.]

5.3.1 Each member of the unit staff shall meet or exceed the minimum qualifications of [Regulatory Guide 1.8, Revision 2, 1987, or more recent revisions, or ANSI Standards acceptable to the NRC staff]. The staff not covered by [Regulatory Guide 1.8] shall meet or exceed the minimum qualifications of [Regulations, Regulatory Guides, or ANSI Standards acceptable to NRC staff].

5.0 ADMINISTRATIVE CONTROLS

5.4 Procedures

5.4.1 Written procedures shall be established, implemented, and maintained covering the following activities:

a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978;

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and NUREG-0737, Supplement 1, as stated in [Generic Letter 82-33];

c. Quality assurance for effluent and environmental monitoring;

d. Fire Protection Program implementation; and

e. All programs specified in Specification 5.5.

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

a. The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program; and

b. The ODCM shall also contain the radioactive effluent controls and radiological environmental monitoring activities, and descriptions of the information that should be included in the Annual Radiological Environmental Operating, and Radioactive Effluent Release Reports required by Specification 5.6.2 and Specification 5.6.3.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) maintain the levels of radioactive effluent control required by 10 CFR 20.106, 40 CFR 190, 10 CFR 50.36a, and 10 CFR 50, Appendix I, and not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the [Plant Manager]; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the changed portion of the ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made.

(continued)

5.5 Programs and Manuals (continued)

5.5.2 Post Accident Sampling

This program provides controls that ensure the capability to obtain and analyze reactor coolant, radioactive gases, and particulates in plant gaseous effluents and containment atmosphere samples under accident conditions. The program shall include the following:

a. Training of personnel;

b. Procedures for sampling and analysis; and

c. Provisions for maintenance of sampling and analysis equipment.

5.5.3 Radioactive Effluent Control Program

This program conforms to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably achievable. The program shall be contained in the ODCM, shall be implemented by procedures, and shall include remedial actions to be taken whenever the program limits are exceeded. The program shall include the following elements:

a. Limitations on the functional capability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoints determination in accordance with the methodology in the ODCM;

b. Limitations on the concentrations of radioactive material released in liquid effluents to unrestricted areas, conforming to 10 CFR 20, Appendix B, Table 2, Column 2;

c. Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.106 and with the methodology and parameters in the ODCM;

d. Limitations on the annual and quarterly doses or dose commitment to a member of the public for radioactive materials in liquid effluents released form each unit to unrestricted areas, conforming to 10 CFR 50, Appendix I;

e. Determination of cumulative and projected dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least every 31 days;

(continued)

5.5 Programs and Manuals

5.5.3 Radioactive Effluent Control Program (continued)

f. Limitations on the functional capability and use of the liquid and gaseous effluent treatment systems to ensure that appropriate portions of these systems are used to reduce releases of radioactivity when the projected doses in a period of 31 days would exceed 2% of the guidelines for the annual dose or dose commitment, conforming to 10 CFR 50, Appendix I;

g. Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas beyond the site boundary conforming to the dose associated with 10 CFR 20, Appendix B, Table 2, Column 1;

h. Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I;

i. Limitations on the annual and quarterly doses to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and

j. Limitations on the annual dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

5.5.4 Inservice Testing Program

This program provides control for inservice testing of ASME Code Class 1, 2, and 3 components including applicable supports. The program shall include the following:

a. Testing frequencies specified in Section XI of the ASME Boiler and Pressure Vessel Code and Applicable Addenda as follows:

(continued)

5.5 Programs and Manuals

5.5.4 Inservice Testing Program (continued)

ASME Boiler and Pressure Vessel Code and applicable Addenda Terminology for inservice testing activities	Required Frequencies for performing inservice testing activities
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Quarterly or every 3 months	At least once per 92 days
Semiannually or every 6 months	At least once per 184 days
Every 9 months	At least once per 276 days
Yearly or annually	At least once per 366 days
Biennially or every 2 years	At least once per 731 days

b. The provisions of SR 3.0.2 are applicable to the above required Frequencies for performing inservice testing activities;

c. The provisions of SR 3.0.3 are applicable to inservice testing activities;

d. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

5.5.5 Steam Generator (SG) Tube Surveillance Program

The tube integrity of each steam generator shall be demonstrated by performance of the following augmented inservice inspection program.

a. SG tube sample size selection, sample size expansion, and inspection results classification criteria. Sample selection and testing shall be in accordance with [Regulatory Guide 1.83 Revision [ ], date].

b. The establishment of SG tube inspection frequency dependent upon inspection result classification. Inspection frequency shall be in accordance with [Regulatory Guide 1.83 Revision [ ], date].

(continued)

5.5 Programs and Manuals

5.5.5 Steam Generator (SG) Tube Surveillance Program (continued)

c. SG tube plugging/repair limits. These limits shall be [40%] of the nominal tube wall thickness consistent with [Regulatory Guide 1.83 Revision [ ], date].

d. Specific definitions and limits for SG tube inservice inspection acceptance criteria consistent with [Regulatory Guide 1.83 Revision [ ], date].

The content and frequency of written reports shall be in accordance with Specification 5.6.8.

The provisions of SR 3.0.2 are not applicable to SG Tube Surveillance Program inspection frequencies.

[Reviewer Note: Reference letter DCP/NRC 0983.]

5.5.6 Secondary Water Chemistry Program

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation and low pressure turbine disc stress corrosion cracking and flow accelerated corrosion of all carbon steel components. The program shall include:

a. Identification of a sampling schedule for the critical variables and control points for these variables;

b. Identification of the procedures used to measure the values of the critical variables;

c. Identification of process sampling points, which shall include monitoring the discharge of the condensate pumps for evidence of condenser in leakage;

d. Procedures for the recording and management of data;

e. Procedures defining corrective actions for all off control point chemistry conditions; and

f. A procedure identifying the authority responsible for the interpretation of the data and the sequence and timing of administrative events, which is required to initiate corrective action.

(continued)

5.5 Programs and Manuals (continued)

5.5.7 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes does not involve either of the following:

   1. a change in the TS incorporated in the license; or

   2. a change to the updated FSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the FSAR.

d. Proposed changes that meet the criteria of (b) above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

5.5.8 Safety Function Determination Program (SFDP)

This program ensure loss of safety function is detected and appropriate action taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other appropriate actions may be taken as a result of the supported system inoperability and corresponding exception to entering supported system Condition and Required Actions. This program implements the requirement of LCO 3.0.6. The SFDP shall contain the following:

a. Provisions for cross train checks to ensure a loss of the capability to perform the safety function assumed in the accident analysis does not go undetected;

b. Provisions for ensuring the plant is maintained in a safe condition if a loss of function condition exists;

(continued)

5.5 Programs and Manuals

5.5.8 Safety Function Determination Program (SFDP) (continued)

c. Provisions to ensure that an inoperable supported system's Completion Time is not inappropriately extended as a result of multiple support systems inoperabilities; and

d. Other appropriate limitations and remedial or compensatory actions.

A loss of safety function exists when, assuming no concurrent single failure, a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable; or

b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or

c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.9 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program, dated September 1995," as modified by approved exceptions.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is [< 45 psig].

(continued)

5.5 Programs and Manuals

5.5.9 Containment Leakage Rate Testing Program (continued)

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.10% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment overall leakage rate acceptance criterion is $\leq$ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 La for the Type B and Type C tests and $\leq$ 0.75 La for Type A tests;

b. Air lock testing acceptance criteria are:

   1) Overall air lock leakage rate is $\leq$ [0.05 L_a] when tested at $\geq$ Pa,

   2) For each door, leakage rate is $\leq$ [0.01 L_a] when pressurized to [$\geq$ 10 psig].

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

5.5.10 System Level Operability Testing Program

The System Level Operability Testing Program provides requirements for performance tests of passive systems. The System Level Inservice Tests specified in Section 3.9.6 and Table 3.9-17 apply when specified by individual Surveillance Requirements.

a. The provisions of SR 3.0.2 are applicable to the test frequencies specified in Table 3.9.17 for performing system level operability testing activities; and

b. The provisions of SR 3.0.3 are applicable to system level operability testing activities.

(continued)

5.5 Programs and Manuals (continued)

5.5.11 Component Cyclic or Transient Limit

This program provides controls to track the Table 3.9-1A reactor coolant system design transient cycles to ensure that components are maintained within the design limits.

(continued)

5.0 ADMINISTRATIVE CONTROLS

5.6 Reporting Requirements

The following reports shall be submitted in accordance with 10 CFR 50.4.

5.6.1 Occupational Radiation Exposure Report

----------------------------NOTE----------------------------
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.

A tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures > 100 mrem/yr and their associated man rem exposure according to work and job functions (e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance, waste processing, and refueling). This tabulation supplements the requirements of 10 CFR 20.2206. The dose assignments to various duty functions may be estimated based on pocket dosimeter, thermoluminescent dosimeter (TLD), or film badge measurements. Small exposures totaling < 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources should be assigned to specific major work functions. The report shall be submitted by April 30 of each year. [The initial report shall be submitted by April 30 of the year following the initial criticality.]

5.6.2 Annual Radiological Environmental Operating Report

----------------------------NOTE----------------------------
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.

The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted by May 15 of each year. The report shall include summaries, interpretations, and analyses of trends of the results of the radiological environmental monitoring program for the reporting period. The material provided shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM), and in 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

(continued)

5.6 Reporting Requirements

5.6.2 Annual Radiological Environmental Operating Report (continued)

The Annual Radiological Environmental Operating Report shall include the results of analyses of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements [in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979]. [The report shall identify the TLD results that represent collocated dosimeters in relation to the NRC TLD program and the exposure period associated with each result.] In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

5.6.3 Radioactive Effluent Release Report

----------------------------NOTE----------------------------
A single submittal may be made for a multiple unit station.

The Radioactive Effluent Release Report covering the operation of the unit shall be submitted in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR 50, Appendix I, Section IV.B.1.

5.6.4 Monthly Operating Reports

Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the pressurizer safety valves, shall be submitted on a monthly basis no later than the 15th of each month following the calendar month covered by the report.

(continued)

5.6 Reporting Requirements (continued)

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

3.1.4, "Moderator Temperature Coefficient"
3.1.6, "Shutdown Bank Insertion Limits"
3.1.7, "Control Bank Insertion Limits"
3.2.1, "Heat Flux Hot Channel Factor"
3.2.2, "Nuclear Enthalpy Rise Hot Channel Factor"
3.2.3, "Axial Flux Difference"
3.2.5, "OPDMS-monitored Power Distribution Parameters"
3.9.1, "Boron Concentration"

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985 (Westinghouse Proprietary).

(Methodology for Specifications 3.1.4 - Moderator Temperature Coefficient, 3.1.6 - Shutdown Bank Insertion Limits, 3.1.7 - Control Bank Insertion Limits, 3.2.1 - Heat Flux Hot Channel Factor, 3.2.2 - Nuclear Enthalpy Rise Hot Channel Factor, 3.2.3 - Axial Flux Difference, and 3.9.1 - Boron Concentration.)

2a. WCAP-8385, "Power Distribution Control and Load Following Procedures - Topical Report," September 1974 (Westinghouse Proprietary).

(Methodology for Specification 3.2.3 - Axial Flux Difference (Constant Axial Offset Control).)

2b. T. M. Anderson to K. Kniel (Chief of Core Performance Branch, NRC) January 31, 1980 - Attachment: Operation and Safety Analysis Aspects of an Improved Load Follow Package.

(Methodology for Specification 3.2.3 - Axial Flux Difference (Constant Axial Offset Control).)

(continued)

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

2c. NUREG-0800, Standard Review Plan, U.S. Nuclear Regulatory Commission, Section 4.3, Nuclear Design, July 1981. Branch Technical Position CPB 4.3-1, Westinghouse Constant Axial Offset Control (CAOC), Rev. 2, July 1981.

(Methodology for Specification 3.2.3 - Axial Flux Difference (Constant Axial Offset Control).)

3. WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control FQ Surveillance Technical Specification," February 1994 (Westinghouse Proprietary).

(Methodology for Specifications 3.2.2 - Axial Flux Difference (Relaxed Axial Offset Control) and 3.2.1 - Heat Flux Hot Channel Factor (W(Z) surveillance requirements for FQ Methodology).)

4. WCAP-12945-P, Volumes 1-5, "Westinghouse Code Qualification Document for Best Estimate Loss of Coolant Accident Analysis," Revision 1, March 1998.

(Methodology for Specification 3.2.1 - Heat Flux Hot Channel Factor.)

5. WCAP-14807, "NOTRUMP Final Validation for AP600," R.L. Fittante et al., January 1997, Revision 5, August 1998.

(Methodology for Specification 3.2.1 - Heat Flux Hot Channel Factor.)

6. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994 and Addendum 1, May 1996 (Westinghouse Proprietary).

(Methodology for Specification 3.2.5 - OPDMS - Monitored Power Distribution Parameters.)

------------------- REVIEWER'S NOTE -------------------
Additional power distribution control and surveillance methodologies (for MSHIM and OPDMS monitoring) are currently under development and will be added upon NRC approval. An NRC approved addendum to WCAP-12472-P-A covering AP600 power distribution control and surveillance methodologies must be in place prior to generating an AP600 specific version of this technical specification.

(continued)

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Passive Core Cooling Systems limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

a. RCS pressure and temperature limits for heat up, cooldown, low temperature operation, criticality, and hydrostatic testing as well as heatup and cooldown rates shall be established and documented in the PTLR for the following:

3.4.3, "RCS Pressure and Temperature (P/T) Limits"
3.4.15, "Low Temperature Overpressure Protection (LTOP) System"

b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in the following document:

WCAP-14040-A, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves." (Limits for LCO 3.4.3 and LCO 3.4.15).

c. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluency period and for any revision or supplement thereto.

5.6.7 PAM Report

When a report is required by Condition B of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

(continued)

5.6 Reporting Requirements (continued)

5.6.8 Steam Generator Tube Inspection Report

a. Within 15 days following the completion of each inservice inspection of steam generator tubes, the number of tubes plugged in each steam generator shall be reported to the NRC.

b. The complete results of the steam generator tube inservice inspection shall be submitted to the NRC within 12 months following the completion of the inspection. This report shall include:

   1) Number and extent of tubes inspected

   2) Location and percent of wall-thickness penetration for each indication of an imperfection, and

   3) Identification of tubes plugged.

c. Results of steam generator tube inspections which fall into Category C-3 shall be reported to the NRC within 30 days and prior to resumption of plant operations. This report shall provide a description of investigations conducted to determine the cause of the tube degradation and corrective measures taken to prevent recurrence.

5.0 ADMINISTRATIVE CONTROLS

5.7 High Radiation Area

5.7.1 Pursuant to 10 CFR 20, paragraph 20.1601(c), in lieu of the requirements of 10 CFR 20.1601, each high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is > 100 mrem/hr but < 1000 mrem/hr, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g., [Health Physics Technicians]) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates ≤ 1000 mrem/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device that continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel are aware of them.

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the [Radiation Protection Manager] in the RWP.

(continued)

5.7 High Radiation Area (continued)

5.7.2 In addition to the requirements of Specification 5.7.1, areas with radiation levels ≥ 1000 mrem/hr shall be provided with locked or continuously guarded doors to prevent unauthorized entry and the keys shall be maintained under the administrative control of the Shift Foreman on duty or health physics supervision. Doors shall remain locked except during periods of access by personnel under an approved RWP that shall specify the dose rate levels in the immediate work areas and the maximum allowable stay times for individuals in those areas. In lieu of the stay time specification of the RWP, direct or remote (such as closed circuit TV cameras) continuous surveillance may be made by personnel qualified in radiation protection procedures to provide positive exposure control over the activities being performed within the area.

5.7.3 For individual high radiation areas with radiation levels of > 1000 mrem/hr, accessible to personnel, that are located within large areas such as reactor containment, where no enclosure exists for purposes of locking, or that cannot be continuously guarded, and where no enclosure can be reasonably constructed around the individual area, that individual area shall be barricaded and conspicuously posted, and a flashing light shall be activated as a warning device.

B 2.0 SAFETY LIMITS (SLs)

B 2.1.1 Reactor Core Safety Limits (SLs)

BASES

BACKGROUND

GC 10 (Ref. 1) requires that specified acceptable fuel design limits are not to be exceeded during steady state operation, normal operational transients, and anticipated operational occurrences (AOOs). This is accomplished by having a departure from nucleate boiling (DNB) design basis, which corresponds to a 95% probability at a 95% confidence level (the 95/95 DNB criterion) that DNB will not occur, and by requiring that the fuel centerline temperature stays below the melting temperature.

The restriction of this SL prevents overheating of the fuel and cladding, as well as possible cladding perforation, that would result in the release of fission products to the reactor coolant. Overheating of the fuel is prevented by maintaining the steady state peak linear heat rate (LHR) below the level at which fuel centerline melting occurs. Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime, where the heat transfer coefficient is large and the cladding surface temperature is slightly above the coolant saturation temperature.

Fuel centerline melting occurs when the local LHR or power peaking in a region of the fuel is high enough to cause the fuel centerline temperature to reach the melting point of the fuel. Expansion of the pellet upon centerline melting may cause the pellet to stress the cladding to the point of failure, allowing an uncontrolled release of activity to the reactor coolant.

Operation above the boundary of the nucleate boiling regime could result in excessive cladding temperature because of the onset of DNB and the resultant sharp reduction in heat transfer coefficient. Inside the steam film, high cladding temperatures are reached, and a cladding water (Zirconium water) reaction may take place. This chemical reaction results in oxidation of the fuel cladding to a structurally weaker form. This weaker form may lose its integrity, resulting in an uncontrolled release of activity to the reactor coolant.

(continued)

BASES

BACKGROUND (continued)	The proper functioning of the Reactor Protection System (RPS) and steam generator safety valves prevents violation of the reactor core SLs.

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of normal operation and AOOs. The reactor core SLs are established to preclude violation of the following fuel design criteria:

a. There must be at least 95% probability at a 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience DNB; and

b. The hot fuel pellet in the core must not experience centerline fuel melting.

The Reactor Trip System (RTS) setpoints (Ref. 2), in combination with all the LCOs, are designed to prevent any anticipated combination of transient conditions for Reactor Coolant System (RCS) temperature, pressure, and THERMAL POWER level that would result in a departure from nucleate boiling ratio (DNBR) of less than the DNBR limit or the fuel assembly channel exit quality limit to be exceeded, or the vessel exit boiling limit to be exceeded.

Automatic enforcement of these reactor core SLs are provided by the following functions:

a. High pressurizer pressure trip,

b. Low pressurizer pressure trip,

c. Overtemperature ΔT trip,

d. Overpower ΔT trip,

e. Power Range Neutron Flux trip, and

f. Steam generator safety valves.

The limitation that the average enthalpy in the hot leg be less than or equal to the enthalpy of saturated liquid also ensures that the ΔT measured by instrumentation used in the RPS design as a measure of core power, is proportional to core power.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	The SLs represent a design requirement for establishing the RTS setpoints. LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," or the assumed initial conditions of the safety analyses (as indicated in Section 7.2, Ref. 2) provide more restrictive limits to ensure that the SLs are not exceeded.
SAFETY LIMITS	The curves provided in Figure 2.1.1-1 show the loci of points of THERMAL POWER, RCS pressure, and average temperature for which the minimum DNBR is not less than the safety analysis limit, that fuel centerline temperature remains below melting, that the average enthalpy in the hot leg is less than or equal to the enthalpy of saturated liquid, or that the exit quality is within the limits defined by the DNBR correlation. The curves are based on enthalpy hot channel factor limits provided in the COLR. The dashed line of Figure B 2.1.1-1 shows an example of limit curves at various pressures. In addition, it illustrates the various RPS functions that are designed to prevent the unit from reaching the limit. The SL is higher than the limit calculated when the AFD is within the limits of the $F_1(\Delta I)$ function of the overtemperature ΔT reactor trip. When the AFD is not within the tolerance, the AFD effect on the overtemperature ΔT reactor trips will reduce the setpoints to provide protection consistent with the reactor core SLs (Ref. 3 and 4).
APPLICABILITY	SL 2.1.1 only applies in MODES 1 and 2 because these are the only MODES in which the reactor is critical. Automatic protection functions are required to be OPERABLE during MODES 1 and 2 to ensure operation within the reactor core SLs. The steam generator safety valves or automatic protection actions serve to prevent RCS heatup to the reactor core SL conditions or to initiate a reactor trip function which forces the unit into MODE 3. Setpoints for the reactor trip functions are specified in LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." In MODES 3, 4, 5, and 6, applicability is not required since the reactor is not generating significant THERMAL POWER.

(continued)

BASES (continued)

SAFETY LIMIT VIOLATIONS

The following SL violation responses are applicable to the reactor core SLs.

2.2.1

If SL 2.1.1 is violated, the requirement to go to MODE 3 places the unit in a MODE in which this SL is not applicable.

The allowed Completion Time of 1 hour recognizes the importance of bringing the unit to a MODE of operation where this SL is not applicable, and reduces the probability of fuel damage.

2.2.2

If SL 2.1.1 is violated, the NRC Operations Center must be notified within 1 hour, in accordance with 10 CFR 50.72 (Ref. 5).

2.2.3

If SL 2.1.1 is violated, the [Plant Manager and a specified corporate executive] shall be notified within 24 hours. This 24 hour period provides time for the plant operators and staff to take the appropriate immediate action and assess the condition of the unit before reporting to senior management.

2.2.4

If SL 2.1.1 is violated, a Licensee Event Report shall be prepared and submitted to the NRC within 30 days, in accordance with 10 CFR 50.73 (Ref. 6). A copy of the report shall also be provided to the [Plant Manager and a specified corporate executive].

2.2.5

If SL 2.1.1 is violated, restart of the unit shall not commence until authorized by the NRC. This requirement provides assurance to the NRC that all necessary reviews, analyses, and actions are completed before the unit begins its restart to normal operation.

(continued)

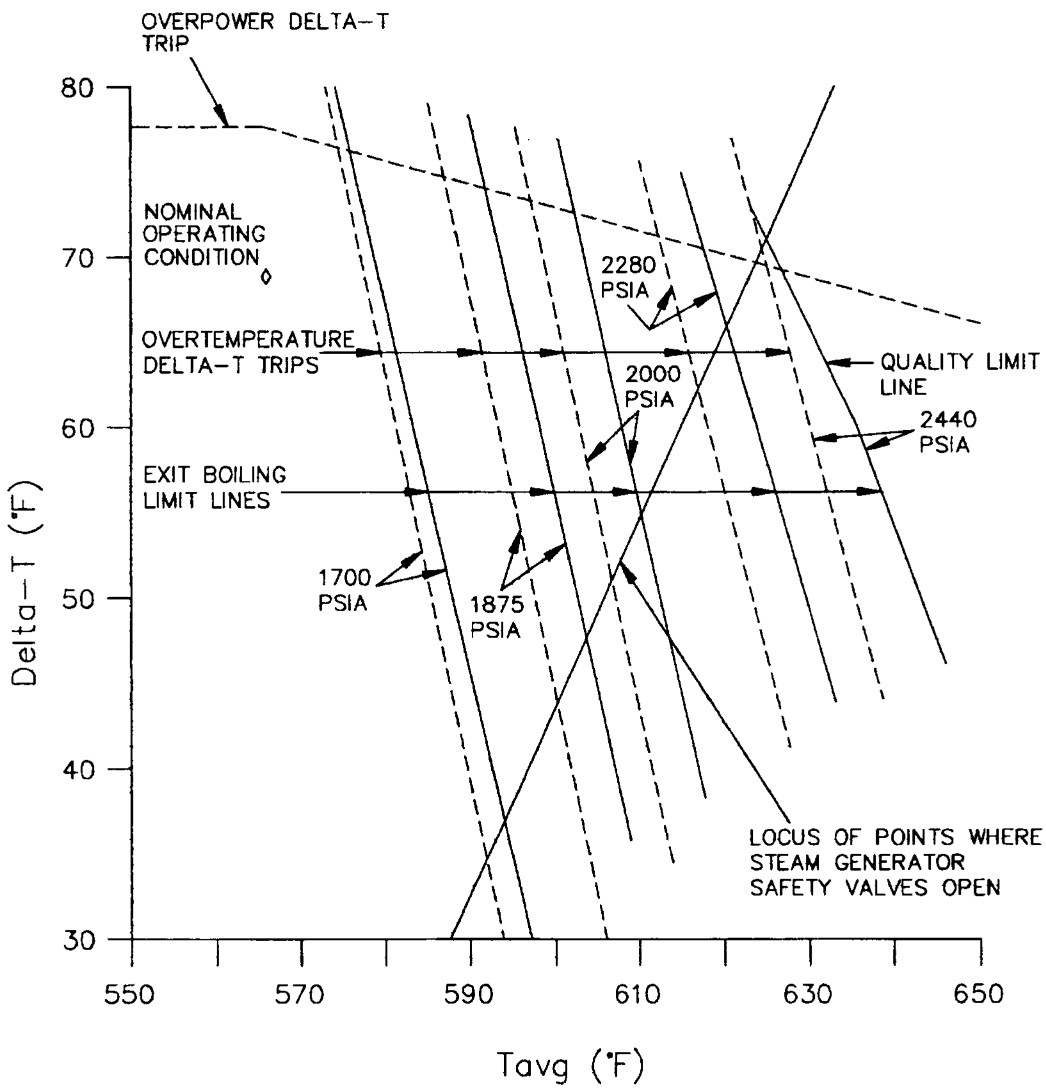

Figure B 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits vs Boundary of Protection

BASES (continued)

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10.

2. Section 7.2, "Reactor Trip."

3. WCAP-8746-A, "Design Bases for the Thermal Overpower ΔT and Thermal Overtemperature ΔT Trip Functions," March 1977.

4. WCAP-9273-NP-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

5. 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors."

6. 10 CFR 50.73, "Licensee Event Report System."

B 2.0 SAFETY LIMITS (SLs)

B 2.1.2 Reactor Coolant System (RCS) Pressure SL

BASES

BACKGROUND

The SL on RCS pressure protects the integrity of the RCS against overpressurization. In the event of fuel cladding failure, fission products are released into the reactor coolant. The RCS then serves as the primary barrier in preventing the release of fission products into the atmosphere. By establishing an upper limit on RCS pressure, the continued integrity of the RCS is ensured. According to 10 CFR 50, Appendix A, GDC 14, "Reactor Coolant Pressure Boundary," and GDC 15, "Reactor Coolant System Design" (Ref. 1), the reactor coolant pressure boundary (RCPB) design conditions are not to be exceeded during normal operation and anticipated operational occurrences (AOOs). Also, in accordance with GDC 28, "Reactivity Limits" (Ref. 1), reactivity accidents, including rod ejection, do not result in damage to the RCPB greater than limited local yielding.

The design pressure of the RCS is 2500 psia (2485 psig). During normal operation and AOOs, RCS pressure is limited from exceeding the design pressure by more than 10%, in accordance with Section III of the American Society of Mechanical Engineers (ASME) Code (Ref. 2). To ensure system integrity, all RCS components are hydrostatically tested at 125% of design pressure, according to the ASME Code requirements prior to initial operation when there is no fuel in the core. Following inception of unit operation, RCS components shall be pressure tested, in accordance with the requirements of ASME Code, Section XI (Ref. 3).

Overpressurization of the RCS could result in a breach of the RCPB. If such a breach occurs in conjunction with a fuel cladding failure, fission products could enter the containment atmosphere, raising concerns relative to limits on radioactive releases.

APPLICABLE SAFETY ANALYSES

The RCS pressurizer safety valves, the main steam safety valves (MSSVs), and the reactor high pressurizer pressure trip have settings established to ensure that the RCS pressure SL will not be exceeded.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The RCS pressurizer safety valves are sized to prevent system pressure from exceeding the design pressure by more than 10%, as specified in Section III of the ASME Code for Nuclear Power Plant Components (Ref. 2). The transient that establishes the required relief capacity, and hence valve size requirements and lift settings, is a complete loss of external load with loss of feedwater flow, without a direct reactor trip. During the transient, no control actions are assumed except that the safety valves on the secondary plant are assumed to open when the steam pressure reaches the secondary plant safety valve settings and nominal feedwater supply is maintained.

The Reactor Trip System setpoints (Ref. 5), together with the settings of the MSSVs, provide pressure protection for normal operation and AOOs. The reactor high pressurizer pressure trip setpoint is specifically set to provide protection against overpressurization (Ref. 5). The safety analyses for both the high pressurizer pressure trip and the RCS pressurizer safety valves are performed using conservative assumptions relative to pressure control devices.

More specifically, no credit is taken for operation of the following:

a. RCS depressurization valves;
b. Steam line relief valves;
c. Turbine Bypass System;
d. Reactor Control System;
e. Pressurizer Level Control System; or
f. Pressurizer spray.

SAFETY LIMITS

The maximum transient pressure allowed in the RCS pressure vessel under the ASME Code, Section III, is 110% of design pressure. The maximum transient pressure allowed in the RCS piping, valves, and fittings [under USAS, Section B31.1, Ref. 6] is 120% of design pressure. The most limiting of these two allowances is the 110% of design pressure; therefore, the SL on maximum allowable RCS pressure is 2733.5 psig.

(continued)

BASES (continued)

APPLICABILITY	SL 2.1.2 applies in MODES 1, 2, 3, 4, and 5 because this SL could be approached or exceeded in these MODES due to overpressurization events. The SL is not applicable in MODE 6 since the reactor vessel closure bolts are not fully tightened, making it unlikely that the RCS can be pressurized.

SAFETY LIMIT VIOLATIONS

The following SL violations are applicable to the RCS pressure SL.

2.2.2.1

If the RCS pressure SL is violated when the reactor is in MODE 1 or 2, the requirement is to restore compliance and be in MODE 3 within 1 hour.

Exceeding the RCS pressure SL may cause immediate RCS failure and create a potential for abnormal radioactive releases.

The allowable Completion Time of 1 hour recognizes the importance of reducing power level to a MODE of operation where the potential for challenges to safety systems is minimized.

2.2.2.2

If the RCS pressure SL is exceeded in MODE 3, 4, or 5, RCS pressure must be restored to within the SL value within 5 minutes. Exceeding the RCS pressure SL in MODE 3, 4, or 5 is more severe than exceeding this SL in MODE 1 or 2, since the reactor vessel temperature may be lower and the vessel material, consequently, less ductile. As such, pressure must be reduced to less than the SL within 5 minutes. The action does not require reducing MODES, since this would require reducing temperature, which would compound the problem by adding thermal gradient stresses to the existing pressure stress.

2.2.3

If the RCS pressure SL is violated, the NRC Operations Center must be notified within 1 hour, in accordance with 10 CFR 50.72 (Ref. 7).

(continued)

BASES

SAFETY LIMIT VIOLATIONS (continued)

2.2.4

If the RCS pressure SL is violated, the [Plant Manager and a specified corporate executive shall be notified with 24 hours. The 24 hour period provides time for the plant operators and staff to take the appropriate immediate action and assess the condition of the unit before reporting to senior management.

2.2.5

If the RCS pressure SL is violated, a Licensee Event Report shall be prepared and submitted within 30 days to the NRC, in accordance with 10 CFR 50.73 (Ref. 8). A copy of the report shall also be provided to the [Plant Manager and a specified corporate executive].

2.2.6

If the RCS pressure SL is violated, restart of the unit shall not commence until authorized by the NRC. This requirement provides assurance to the NRC that all necessary reviews, analyses, and actions are completed before the unit begins its restart to normal operation.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 14, GDC 15, and GDC 28.
2. ASME, Boiler and Pressure Vessel Code, Section III, Article NB-7000.
3. ASME Boiler and Pressure Vessel Code, Section XI, Article IWX-5000.
4. 10CFR100.
5. Section 7.2, "Reactor Trip System."
6. USAS B31.1, "Standard Code for Pressure Piping," American Society of Mechanical Engineers, 1967.
7. 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors."
8. 10 CFR 50.73, "Licensee Event Report System."

B 3.0 LIMITING CONDITIONS FOR OPERATION (LCO) APPLICABILITY

BASES

LCOs	LCO 3.0.1 through LCO 3.0.6 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.
LCO 3.0.1	LCO 3.0.1 establishes the Applicability statement within each individual Specification as the requirements for when the LCO is required to be met (i.e. when the unit is in the MODES or other specified conditions of the Applicability statement of each Specification.)

LCO 3.0.2

LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that the ACTIONS Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of an LCO are not met. This specification establishes that:

a. Completion of the Required Actions within the specified Completion Times constitutes compliance with a Specification; and

b. Completion of the Required Actions is not required when an LCO is met within the specified Completion Time, unless otherwise specified.

There are two basic types of Required Actions. The first type of Required Action specifies a time limit in which the LCO must be met. This time limit is the Completion Time to restore an inoperable system or component to OPERABLE status or to restore variables to within specified limits. If this type of Required Action is not completed within the specified Completion Time, a shutdown may be required to place the unit in a MODE or condition in which the Specification is not applicable. (Whether stated as a Required Action or not, correction of the entered Condition is an action that may always be considered upon entering ACTIONS.) The second type of Required Action specifies the remedial measures that permit continued operation of the

(continued)

BASES

LCO 3.0.2 (continued)

unit that is not further restricted by the Completion Time. In this case compliance with to the Required Actions provides an acceptable level of safety for continued operation.

Completing the Required Actions is not required when an LCO is met, or is no longer applicable, unless otherwise stated in the individual Specifications.

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual LCO's ACTIONS specify the Required Actions where this is the case. An example of this is in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits."

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Intentional entry into ACTIONS should not be made for operational convenience. Alternatives that would not result in redundant equipment being inoperable should be used instead. Doing so limits the time both subsystems/trains of a safety function are inoperable and limits the time other conditions could exist which result in LCO 3.0.3 being entered. Individual Specifications may specify a time limit for performing an SR when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

When a change in MODE or other specified condition is required to comply with Required Actions, the unit may enter a MODE or other specified condition in which another Specification becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new Specification becomes applicable, and the ACTIONS Condition(s) are entered.

(continued)

BASES (continued)

LCO 3.0.3

LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met; and:

a. An associated Required Action and Completion Time is not met and no other Condition applies; or

b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit. Sometimes, possible combinations of Conditions are such that entering LCO 3.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that LCO 3.0.3 be entered immediately.

This Specification delineates the time limits for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

Upon entering into LCO 3.0.3, 1 hour is allowed to prepare for an orderly shutdown before initiating a change in unit operation. This includes time to permit the operator to coordinate the reduction in electrical generation with the load dispatcher to ensure the stability and availability of the electrical grid. The time limits specified to reach lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner that is well within the specified maximum cooldown rate and within the capabilities of the unit, assuming that only the minimum required equipment is operable. This reduces thermal stresses on components of the Reactor Coolant System and the potential for a plant upset that could challenge safety systems under conditions to which this specification applies. The use and interpretation of specified times to complete the actions of LCO 3.0.3 are consistent with the discussion of Section 1.3, "Completion Times."

(continued)

BASES

LCO 3.0.3 (continued)

A unit shutdown required in accordance with LCO 3.0.3 may be terminated, and LCO 3.0.3 exited if any of the following occurs:

a. The LCO is now met.

b. A Condition exists for which the Required Actions have now been performed.

c. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition was initially entered and not from the time LCO 3.0.3 is exited.

The time limits of Specification 3.0.3 allow 37 hours for the unit to be in MODE 5 when a shutdown is required during MODE 1 operation. If the unit is in a lower MODE of operation when a shutdown is required, the time limit for reaching the next lower MODE applies. If a lower MODE is reached in less time than allowed, however, the total allowable time to reach MODE 5, or other applicable MODE is not reduced. For example, if MODE 3 is reached in 2 hours, then the time allowed for reaching MODE 4 is the next 11 hours, because the total time for reaching MODE 4 is not reduced from the allowable limit of 13 hours. Therefore, if remedial measures are completed that would permit a return to MODE 1, a penalty is not incurred by having to reach a lower MODE of operation in less than the total time allowed.

In MODES 1, 2, 3, and 4 LCO 3.0.3 provides actions for Conditions not covered in other Specifications. The requirements of LCO 3.0.3 do not apply in MODES 5 and 6 because the unit is already in the most restrictive condition required by LCO 3.0.3. The requirements of LCO 3.0.3 do not apply in other specified conditions of the Applicability (unless in MODE 1, 2, 3, or 4) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.

Examples of the required end states specified for inoperable passive systems while in MODES 5 and 6 are provided in Table B 3.0-1, Passive Systems Shutdown MODE Matrix. These requirements are specified in the individual Specifications. The required end states

(continued)

Passive Systems Shutdown MODE Matrix

LCO Applicability	Automatic Depressurization System	Core Makeup Tank	Passive RHR	IRWST	Containment	Containment Cooling[1]
MODE 5 RCS pressure boundary intact	9 of 10 paths OPERABLE All paths closed LCO 3.4.13	One CMT OPERABLE LCO 3.5.3	System OPERABLE LCO 3.5.5	One injection flow path and one recirculation sump flow path OPERABLE LCO 3.5.7	Closure capability LCO 3.6.8	Two water flow paths OPERABLE LCO 3.6.7
Required End State	MODE 5 RCS pressure boundary open, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary open, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary open, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level
MODE 5 RCS pressure boundary open or pressurizer level <20%	Stages 1, 2, and 3 open 2 stage 4 valves OPERABLE LCO 3.4.14	None	None	One injection flow path and one recirculation sump flow path OPERABLE LCO 3.5.7	Closure capability LCO 3.6.8	Two water flow paths OPERABLE LCO 3.6.7
Required End State	MODE 5 RCS pressure boundary open, ≥ 20% pressurizer level			MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level	MODE 5 RCS pressure boundary intact, ≥ 20% pressurizer level
MODE 6 Upper internals in place	Stages 1, 2, and 3 open 2 stage 4 valves OPERABLE LCO 3.4.14	None	None	One injection flow path and one recirculation sump flow path OPERABLE LCO 3.5.8	Closure capability LCO 3.6.8	Two water flow paths OPERABLE LCO 3.6.7
Required End State	MODE 6 Upper internals removed			MODE 6 Refueling cavity full	MODE 6 Refueling cavity full	MODE 6 Refueling cavity full
MODE 6 Upper internals removed	None	None	None	One injection flow path and one recirculation sump flow path OPERABLE LCO 3.5.8	Closure capability LCO 3.6.8	Two water flow paths OPERABLE LCO 3.6.7
Required End State				MODE 6 Refueling cavity full	MODE 6 Refueling cavity full	MODE 6 Refueling cavity full

(1) Containment cooling via PCS is not required when core decay heat <6 MWt.

BASES

LCO 3.0.3 (continued)

specified for passive systems, when the unit is in MODE 5 or 6, are selected to ensure that the initial conditions and system and equipment availabilities minimize the likelihood and consequences of potential shutdown events.

Exceptions to 3.0.3 are provided in instances where requiring a unit shutdown in accordance with LCO 3.0.3, would not provide appropriate remedial measures for the associated condition of the unit. An example of this is in LCO 3.7.5, Spent Fuel Pool Water Level. This Specification has an Applicability of "At all times." Therefore, this LCO can be applicable in any or all MODES. If the LCO and the Required Actions of LCO 3.7.5 are not met while in MODE 1, 2, or 3, there is no safety benefit to be gained by placing the unit in a shutdown condition. The Required Action of LCO 3.7.5 of "Suspend movement of irradiated fuel assemblies in the spent fuel pool" is the appropriate Required Action to complete in lieu of the actions of LCO 3.0.3. These exceptions are addressed in the individual Specifications.

LCO 3.0.4

LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It precludes placing the unit in a MODE or other specified condition stated that Applicability (e.g., Applicability desired to be entered) when the following exist:

a. Unit conditions are such that the requirements of the LCO would not be met in the Applicability desired to be entered; and

b. Continued noncompliance with the LCO requirements, if the Applicability were entered, would result in the unit being required to exit the Applicability desired to be entered to comply with the Required Actions.

Compliance with Required Actions that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases,

(continued)

BASES

LCO 3.0.4 (continued)

entry into a MODE or other specified condition in the Applicability may be made in accordance with the provisions of the Required Actions. The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

The provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that results from any unit shutdown.

Exceptions to LCO 3.0.4 are stated in the individual Specifications. Exceptions may apply to all the ACTIONS or to a specific Required Action of a Specification.

LCO 3.0.4 is only applicable when entering MODE 4 from MODE 5, MODE 3 from MODE 4 or 5, MODE 2 from MODE 3 or 4 or 5, or MODE 1 from MODE 2. Furthermore, LCO 3.0.4 is applicable when entering any other specified condition in the Applicability only while operating in MODE 1, 2, 3, or 4. The requirements of LCO 3.0.4 do not apply in MODES 4 and 5, or in other specified conditions of the Applicability (unless in MODE 1, 2, 3, or 4) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.

Surveillances do not have to be performed on the associated inoperable equipment (or on variables outside the specified limits), as permitted by SR 3.0.1. Therefore, changing MODES or other specified conditions while in an ACTIONS Condition, in compliance with LCO 3.0.4 or where an exception to LCO 3.0.4 is stated, is not a violation of SR 3.0.1 or SR 3.0.4 for those Surveillances that do not have to be performed due to the associated inoperable equipment. However, SRs must be met to ensure OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.

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BASES (continued)

LCO 3.0.5

LCO 3.0.5 establishes the allowance of restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONS. The sole purpose of this Specification is to provide an exception to LCO 3.0.2 (e.g., to not comply with the applicable Required Action(s)) to allow the performance of Surveillance Requirements to demonstrate:

a. The OPERABILITY of the equipment being returned to service; or

b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONS is limited to the time absolutely necessary to perform the allowed SRs. This specification does not provide time to perform any other preventive or corrective maintenance.

An example of demonstrating the OPERABILITY of the equipment being returned to service is reopening a containment isolation valve that has been closed to comply with Required Actions and must be reopened to perform the SRs.

An example of demonstrating the OPERABILITY of other equipment is taking an inoperable channel or trip system out of the tripped condition to prevent the trip function from occurring during the performance of an SR on another channel in the other trip system. A similar example of demonstrating the OPERABILITY of other equipment is taking an inoperable channel or trip system out of the tripped condition to permit the logic to function and indicate the appropriate response during the performance of an SR on another channel in the same trip system.

LCO 3.0.6

LCO 3.0.6 establishes an exception to LCO 3.0.2 for support systems that have an LCO specified in the Technical Specifications (TS). This exception is provided because LCO 3.0.2 would require that the Conditions and Required Actions of the associated inoperable supported system LCO be entered solely due to the inoperability of the support system. This exception is justified because the actions that are required to

(continued)

BASES

LCO 3.0.6 (continued)

ensure the unit is maintained in a safe condition are specified in the support system LCO's Required Actions. These Required Actions may include entering the supported system's Conditions and Required Actions or may specify other Required Actions. When a support system is inoperable and there is an LCO specified for it in the TS, the supported system(s) are required to be declared inoperable if determined to be inoperable as a result of the support system inoperability. However it is not necessary to enter into the supported systems' Conditions and Required Actions unless directed to do so by the support system's Required Actions. The potential confusion and inconsistency of requirements related to the entry into multiple support and supported systems' LCOs' Conditions and Required Actions are eliminated by providing all the actions that are necessary to ensure the unit is maintained in a safe condition in the support system's Required Actions.

However, there are instances where a support system's Required Action may either direct a supported system to be declared inoperable or direct entry into Conditions and Required Actions for the supported system. This may occur immediately or after some specified delay to perform some other Required Action. Regardless of whether it is immediate or after some delay, when a support system's Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions shall be entered in accordance with LCO 3.0.2.

Specification 5.5.8, "Safety Function Determination Program (SFDP)," ensures loss of safety function is detected and appropriate actions are taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other limitations, remedial actions, or compensatory actions may be identified as a result of the support system inoperability and corresponding exception to entering supported system Conditions and Required Actions. The SFDP implements the requirements of LCO 3.0.6.

Cross train checks to identify a loss of safety function for those support systems that support multiple and redundant safety systems are required. The cross train check verifies that the supported systems of the

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BASES

LCO 3.0.6 (continued)

redundant OPERABLE support system are OPERABLE, thereby ensuring safety function is retained. If this evaluation determines that a loss of safety function exists, the appropriate Conditions and Required Actions of the LCO in which the loss of safety functions exists are required to be entered.

LCO 3.0.7

There are certain special tests and operations required to be performed at various times over the life of the unit. These special tests and operations are necessary to demonstrate select unit performance characteristics, to perform special maintenance activities, and to perform special evolutions. Test Exception LCO 3.1.8 allows specified Technical Specification (TS) requirements to be changed to permit performance of these special tests and operations, which otherwise could not be performed if required to comply with the requirements of these TS. Unless otherwise specified, all the other TS requirements remain unchanged. This will ensure all appropriate requirements of the MODE or other specified condition not directly associated with or required to be changed to perform the special test or operation will remain in effect.

The Applicability of a Test Exception LCO represents a condition not necessarily in compliance with the normal requirements of the TS. Compliance with Test Exception LCOs is optional. A special operation may be performed either under the provisions of the appropriate Test Exception LCO or under the other applicable TS requirements. If it is desired to perform the special operation under the provisions of the Test Exception LCO, the requirements of the Test Exception LCO shall be followed.

LCO 3.0.8

LCO 3.0.8 establishes the actions that must be implemented when an LCO is not met and:

a. An associated Required Action and Completion Time is not met and no other Condition applies; or

b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit.

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BASES

LCO 3.0.8 (continued)

This Specification delineates the requirements for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

Upon entering LCO 3.0.8, 1 hour is allowed to prepare for an orderly plan of action which optimizes plant safety and equipment restoration. The Shutdown Safety Status Trees provide a systematic method to explicitly determine the status of the plant during shutdown conditions, after entering MODE 5. A set of plant parameters is monitored and if any parameter is outside of its defined limits, a transition is made to the Shutdown Emergency Response Guidelines. These guidelines provide preplanned actions for addressing parameters outside defined limits.

Actions required in accordance with LCO 3.0.8 may be terminated and LCO 3.0.8 exited if any of the following occurs:

a. The LCO is now met.

b. A Condition exists for which the Required Actions have now been performed.

c. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time LCO 3.0.8 is exited.

In MODES 5 and 6, LCO 3.0.8 provides actions for Conditions not covered in other Specifications and for multiple concurrent Conditions for which conflicting actions are specified.

B 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

BASES

SRs

SR 3.0.1 through SR 3.0.4 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

SR 3.0.1

SR 3.0.1 establishes the requirement that SRs must be met during the MODES or other specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This Specification ensures that Surveillances are performed to verify the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet a Surveillance within the specified Frequency, in accordance with SR 3.0.2, constitutes a failure to meet an LCO.

Systems and components are assumed to be OPERABLE when the associated SRs have been met. Nothing in this Specification, however, is to be construed as implying that systems or components are OPERABLE when:

a. The systems or components are known to be inoperable, although still meeting the SRs; or

b. The requirements of the Surveillance(s) are known not to be met between required Surveillance performances.

Surveillances do not have to be performed when the unit is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. The SRs associated with a test exception are only applicable when the test exception is used as an allowable exception to the requirements of a Specification.

Surveillances, including Surveillances invoked by Required Actions, do not have to be performed on inoperable equipment because the ACTIONS define the remedial measures that apply. Surveillances have to be met in accordance with SR 3.0.2 prior to returning equipment to OPERABLE status.

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BASES

SR 3.0.1 (continued)

Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable Surveillances are not failed and their most recent performance is in accordance with SR 3.0.2. Post maintenance testing may not be possible in the current MODE or other specified conditions in the Applicability due to the necessary unit parameters not having been established. In these situations, the equipment may be considered OPERABLE provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a MODE or other specified condition where other necessary post maintenance tests can be completed.

SR 3.0.2

SR 3.0.2 establishes the requirements for meeting the specified Frequency for Surveillances and any Required Actions with a Completion Time that requires the periodic performance of the Required Action on a "once per..." interval.

SR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates Surveillance scheduling and considers plant operating conditions that may not be suitable for conducting the Surveillance (e.g., transient conditions or other ongoing Surveillance or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the Surveillance at its specified Frequency. This is based on the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the SRs. The exceptions to SR 3.0.2 are those Surveillances for which the 25% extension of the interval specified in the Frequency does not apply. These exceptions are stated in the individual Specifications. An example of where SR 3.0.2 does not apply is a Surveillance with a Frequency of "in accordance with 10 CFR 50 Appendix J, as modified by approved exemptions." The requirements of regulations take precedence over the TS. The TS cannot in and of themselves extend a test interval

(continued)

BASES

SR 3.0.2 (continued)

specified in the regulations. Therefore, there is a Note in the Frequency stating, "SR 3.0.2 is not applicable."

As stated in SR 3.0.2, the 25% extension also does not apply to the initial portion of a periodic Completion Time that requires performance on a "once per ..." basis. The 25% extension applies to each performance after the initial performance. The initial performance of the Required Action, whether it is a particular Surveillance or some remedial action, is considered a single action with a single Completion Time. One reason for not allowing the 25% extension to this Completion Time is that such an action usually verifies that no loss of function has occurred by checking the status of redundant or diverse components or accomplishes the function of the inoperable equipment in an alternative manner.

The provisions of SR 3.0.2 are not intended to be used repeatedly merely as an operational convenience to extend Surveillance intervals (other than those consistent with refueling intervals) or periodic Completion Time intervals beyond those specified.

SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a Surveillance has not been completed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is less, applies from the point in time that it is discovered that the Surveillance has not been performed, in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met.

This delay period provides adequate time to complete Surveillances that have been missed. This delay period permits the completion of a Surveillance before compliance with Required Actions or other remedial measures that might preclude completion of the Surveillance.

The basis for this delay period includes consideration of unit Conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in

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BASES

SR 3.0.3 (continued)

completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements. When a Surveillance with a Frequency based not on time intervals, but upon specified unit Conditions or operational situations, is discovered not to have been performed when specified, SR 3.0.3 allows the full delay period of 24-hours to perform the Surveillance.

SR 3.0.3 also provides a time limit for completion of Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend Surveillance intervals.

If a Surveillance is not completed within the allowed delay period, then the equipment is considered inoperable or the variable is considered outside the specified limits and Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the Surveillance.

Completion of the Surveillance within the delay period allowed by this specification, or within the Completion Time of the ACTIONS restores compliance with SR 3.0.1.

SR 3.0.4

SR 3.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability.

This Specification ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these systems and components ensure safe operation of the unit.

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BASES

SR 3.0.4 (continued)

The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or component to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

However, in certain circumstances, failing to meet an SR will not result in SR 3.0.4 restricting a MODE change or other specified condition change. When a system, subsystem, division, component, device, or variable is inoperable or outside its specified limits, the associated SR(s) are not required to be performed, per SR 3.0.1, which states that surveillances do not have to be performed on inoperable equipment. When equipment is inoperable, SR 3.0.4 does not apply to the associated SR(s) since the requirement for the SR(s) to be performed is removed. Therefore, failing to perform the Surveillance(s) within the specified Frequency does not result in an SR 3.0.4 restriction to changing MODES or other specified conditions of the Applicability. However, since the LCO is not met in this instance, LCO 3.0.4 will govern any restrictions that may (or may not) apply to MODE or other specified condition changes.

The provisions of SR 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown.

The precise requirements for performance of SRs are specified such that exceptions to SR 3.0.4 are not necessary. The specific time frames and conditions necessary for meeting the SRs are specified in the Frequency, in the Surveillance, or both. This allows performance of Surveillances when the prerequisite condition(s) specified in a Surveillance procedure require entry into a MODE or other specified condition in the Applicability of the associated LCO prior to the performance or completion of a Surveillance. A Surveillance, that could not be performed until after entering the LCO Applicability, would have its Frequency specified such that it is not "due" until the specific conditions needed are met. Alternately, the

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BASES

SR 3.0.4 (continued)	Surveillance may be stated in the form of a NOTE as not required (to be met or performed) until a particular event, condition, or time has been reached. Further discussion of the specific formats of SR's annotation is found in Section 1.4, Frequency. SR 3.0.4 is only applicable when entering MODE 3 from MODE 4, MODE 2 from MODE 3 or 4, or MODE 1 from MODE 2. Furthermore, SR 3.0.4 is applicable when entering any other specified condition in the Applicability only while operating in MODE 1, 2, or 3. The requirements of SR 3.0.4 do not apply in MODES 4 and 5, or in other specified conditions of the Applicability (unless in MODE 1, 2, or 3) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.