

Standard Technical Specifications Babcock and Wilcox Plants

Specifications

**U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555-0001**



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**Division of Regulatory Improvement Programs
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U.S. Nuclear Regulatory Commission
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PREFACE

This NUREG contains the improved Standard Technical Specifications (STS) for Babcock and Wilcox (B&W) plants. Revision 2 incorporates the cumulative changes to Revision 1, which was published in April 1995. The changes reflected in Revision 2 resulted from the experience gained from license amendment applications to convert to these improved STS or to adopt partial improvements to existing technical specifications. This publication is the result of extensive public technical meetings and discussions among the Nuclear Regulatory Commission (NRC) staff and various nuclear power plant licensees, Nuclear Steam Supply System (NSSS) Owners Groups, and the Nuclear Energy Institute (NEI). The improved STS were developed based on the criteria in the Final Commission Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, dated July 22, 1993 (58 FR 39132), which was subsequently codified by changes to Section 36 of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36) (60 FR 36953). Licensees are encouraged to upgrade their technical specifications consistent with those criteria and conforming, to the practical extent, to Revision 2 to the improved STS. The Commission continues to place the highest priority on requests for complete conversions to the improved STS. Licensees adopting portions of the improved STS to existing technical specifications should adopt all related requirements, as applicable, to achieve a high degree of standardization and consistency.

The Table of Contents is now a Table of Contents / Revision Summary where the revision number and date are listed for each specification and bases, in lieu of traditional page numbers. Each limiting condition for operation (LCO) starts with page 1, with a specification, e.g., "2.0" or bases "B 2.0" number prefix. Subsequent approved revisions to sections will be noted in the table of contents, as well as on each affected page, using a decimal number to indicate the number of revisions to that section, along with the date, e.g., (Rev 2.3, 04/01/01) indicates the third approved change and date since Revision 2.0 was published. Additionally, the final page of each LCO section will be a historical listing of the changes affecting that section. This publication will be maintained in electronic format. Subsequent revisions will not be printed in hard copy. Users may access the subsequent revisions to the STS in the PDF format at (<http://www.nrc.gov/NRR/sts/sts.htm>). This Web site will be updated as needed and the contents may differ from the last printed version. Users may print or download copies from the NRC Web site.

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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.

<u>Term</u>	<u>Definition</u>
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
ALLOWABLE THERMAL POWER	ALLOWABLE THERMAL POWER shall be the maximum reactor core heat transfer rate to the reactor coolant permitted by consideration of the number and configuration of reactor coolant pumps (RCPs) in operation.
AXIAL POWER IMBALANCE	AXIAL POWER IMBALANCE shall be the power in the top half of the core, expressed as a percentage of RATED THERMAL POWER (RTP), minus the power in the bottom half of the core, expressed as a percentage of RTP.
AXIAL POWER SHAPING RODS (APSRs)	APSRs shall be control components used to control the axial power distribution of the reactor core. The APSRs are positioned manually by the operator and are not trippable.
CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass all devices in the channel required for channel OPERABILITY and the CHANNEL FUNCTIONAL TEST. 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. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps.
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

1.1 Definitions

CHANNEL CHECK (continued)

the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.

CHANNEL FUNCTIONAL TEST A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of all devices in the channel required for channel OPERABILITY.

The ESFAS CHANNEL FUNCTIONAL TEST shall also include testing of ESFAS safety related bypass functions for each channel affected by bypass operation. The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total steps.

CONTROL RODS

CONTROL RODS shall be all full length safety and regulating rods that are used to shut down the reactor and control power level during maneuvering operations.

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.

CORE OPERATING LIMITS REPORT (COLR)

The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these 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 [Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites," or those listed in Table E-7 of Regulatory Guide 1.109, Rev. 1, NRC, 1977, or ICRP 30, Supplement to Part 1, page 192-212, table titled, "Committed Dose

1.1 Definitions

DOSE EQUIVALENT I-131 (continued)

	Equivalent in Target Organs or Tissues per Intake of Unit Activity"].
Ē - AVERAGE DISINTEGRATION ENERGY	Ē shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > [15] minutes, making up at least 95% of the total noniodine activity in the coolant.
EMERGENCY FEEDWATER INITIATION AND CONTROL (EFIC) RESPONSE TIME	The EFIC RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its EFIC actuation setpoint at the channel sensor until the emergency feedwater equipment is capable of performing its function (i.e., valves travel to their required positions, pumps discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. 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.
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, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. 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.
LEAKAGE	LEAKAGE shall be: <ol style="list-style-type: none"> a. <u>Identified LEAKAGE</u> <ol style="list-style-type: none"> 1. LEAKAGE, such as that from pump seals or valve packing (except RCP seal water injection or leakoff), 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

1.1 Definitions

LEAKAGE (continued)

known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE, or

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

- b. Unidentified LEAKAGE

All LEAKAGE (except RCP seal water injection or leakoff) that is not identified LEAKAGE, and

- c. Pressure Boundary LEAKAGE

LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an 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.

NUCLEAR HEAT FLUX HOT CHANNEL FACTOR $F_Q(Z)$

$F_Q(Z)$ shall be the maximum local linear power density in the core divided by the core average fuel rod linear power density, assuming nominal fuel pellet and fuel rod dimensions.

NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR ($F_{\Delta H}^N$)

$F_{\Delta H}^N$ shall be the ratio of the integral of linear power along the fuel rod on which minimum departure from nucleate boiling ratio occurs, to the average fuel rod power.

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

1.1 Definitions

OPERABLE - OPERABILITY (continued)

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] of the FSAR,
- 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 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."

QUADRANT POWER TILT (QPT)

QPT shall be defined by the following equation and is expressed as a percentage of the Power in any Core Quadrant (P_{quad}) to the Average Power of all Quadrants (P_{avg}).

$$QPT = 100 [(P_{quad} / P_{avg}) - 1]$$

RATED THERMAL POWER (RTP)

RTP shall be a total reactor core heat transfer rate to the reactor coolant of [2544] MWt.

REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME

The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power is interrupted at the control rod drive trip breakers. The response time may be measured by means of any series of sequential,

1.1 Definitions

RPS RESPONSE TIME (continued)

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 full length CONTROL RODS (safety and regulating) are fully inserted except for the single CONTROL ROD of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CONTROL RODS verified fully inserted by two independent means, it is not necessary to account for a stuck CONTROL ROD in the SDM calculation. With any CONTROL ROD not capable of being fully inserted, the reactivity worth of these CONTROL RODS must be accounted for in the determination of SDM,
- b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the [nominal zero power design level], and
- c. There is no change in APSR position.

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.

Table 1.1-1 (page 1 of 1)
MODES

MODE	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	$\geq [330]$
4	Hot Shutdown ^(b)	< 0.99	NA	$[330] > T_{avg} > [200]$
5	Cold Shutdown ^(b)	< 0.99	NA	$\leq [200]$
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	<p>The purpose of this section is to explain the meaning of logical connectors.</p> <p>Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are <u>AND</u> and <u>OR</u>. The physical arrangement of these connectors constitutes logical conventions with specific meanings.</p>
BACKGROUND	<p>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 by 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 indentations of the logical connectors.</p> <p>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.</p>
EXAMPLES	<p>The following examples illustrate the use of logical connectors.</p>

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify . . .	
	<u>AND</u>	
	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.

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Trip . . .	
	<u>OR</u>	
	A.2.1 Verify . . .	
	<u>AND</u>	
	A.2.2.1 Reduce . . .	
	<u>OR</u>	
	A.2.2.2 Perform . . .	
	<u>OR</u>	
	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	<p>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.</p> <p>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.</p> <p>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 <u>not</u> 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.</p> <p>However, when a <u>subsequent</u> 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:</p> <ol style="list-style-type: none"> Must exist concurrent with the <u>first</u> inoperability and

1.3 Completion Times

DESCRIPTION (continued)

- 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.

EXAMPLES

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

1.3 Completion Times

EXAMPLES (continued)

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.	6 hours
	<u>AND</u>	
	B.2 Be in MODE 5.	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 within 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.

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-2

ACTIONS

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

When a pump is declared inoperable, Condition A is entered. If the pump 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 pump 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 pump is declared inoperable while the first pump is still inoperable, Condition A is not re-entered for the second pump. LCO 3.0.3 is entered, since the ACTIONS do not include a Condition for more than one inoperable pump. 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 pumps 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.

While in LCO 3.0.3, if one of the inoperable pumps 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.

1.3 Completion Times

EXAMPLES (continued)

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

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 <u>AND</u> 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 <u>AND</u> 10 days from discovery of failure to meet the LCO
C. One Function X train inoperable. <u>AND</u> One Function Y train inoperable.	C.1 Restore Function X train to OPERABLE status. <u>OR</u> 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,

1.3 Completion Times

EXAMPLES (continued)

Condition A and Condition B are concurrently applicable. The Completion Times for Condition A and 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.

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.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 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 (plus the extension) expires while one or more valves are still inoperable, Condition B is entered.

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.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 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 applicable only 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 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 that caused entry into Condition B is restored to OPERABLE status, Condition B is exited for that valve.

1.3 Completion Times

EXAMPLES (continued)

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
	<u>OR</u> 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 hour interval of Required Action A.1 begins when Condition A is entered and the initial performance of Required 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.

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.

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-7

ACTIONS

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

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.

1.3 Completion Times

EXAMPLES (continued)

IMMEDIATE When "Immediately" is used as a Completion Time, the Required Action
COMPLETION TIME 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 3.0.2, 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.

Sometimes special situations dictate when the requirements of a Surveillance are to be met. They are "otherwise stated" conditions allowed by SR 3.0.1. They may be stated as clarifying Notes in the Surveillance, as part of the Surveillances, or both.

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 preformed 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.

The use of "met" or "performed" in these instances conveys specific meanings. A Surveillance is "met" only when the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being "performed," constitutes a Surveillance not "met." "Performance" refers only to the requirement to specifically determine the ability to meet the acceptance criteria.

Some Surveillances contain notes that modify the Frequency of performance or the conditions during which the acceptance criteria must be satisfied. For these Surveillances, the MODE-entry restrictions of SR 3.0.4 may not apply. Such a Surveillance is not required to be performed prior to entering a MODE or other specified condition in the Applicability of the associated LCO if any of the following three conditions are satisfied:

1.4 Frequency

DESCRIPTION (continued)

- a. The Surveillance is not required to be met in the MODE or other specified condition to be entered; or
- b. The Surveillance is required to be met in the MODE or other specified condition to be entered, but has been performed within the specified Frequency (i.e., it is current) and is known not to be failed; or
- c. The Surveillance is required to be met, but not performed, in the MODE or other specified condition to be entered, and is known not to be failed.

Examples 1.4-3, 1.4-4, 1.4-5, and 1.4-6 discusses these special situations.

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.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Perform CHANNEL CHECK.	12 hours

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 is not required to be met per SR 3.0.1 (such as when the equipment is inoperable, a variable is outside 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 not otherwise modified (refer to Example 1.4-3), then SR 3.0.3 becomes applicable.

If the interval as 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.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

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

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" indicates that both Frequency requirements must be met. Each time reactor power is increased from a power level $< 25\%$ RTP to $\geq 25\%$ 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 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.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<div style="text-align: center;">----- - NOTE - Not required to be performed until 12 hours after ≥ 25% RTP. -----</div>	
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 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.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<div>- NOTE -</div> <div>Only required to be met in MODE 1.</div>	
Verify leakage rates are within limits.	24 hours

Example 1.4-4 specifies that the requirements of this Surveillance do not have to be met until the unit is in MODE 1. The interval measurement for the Frequency of this Surveillance continues at all times, as described in Example 1.4-1. However, the Note constitutes an "otherwise stated" exception to the Applicability of this Surveillance. Therefore, if the Surveillance were not performed within the 24 hour interval (plus the extension allowed by SR 3.0.2), but the unit was not in MODE 1, there would be no failure of the SR nor failure to meet the LCO. Therefore, no violation of SR 3.0.4 occurs when changing MODES, even with the 24 hour Frequency exceeded, provided the MODE change was not made into MODE 1. Prior to entering MODE 1 (assuming again that the 24 hour Frequency were not met), SR 3.0.4 would require satisfying the SR.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-5

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<hr/> - NOTE - <hr/>	
Only required to be performed in MODE 1.	
<hr/>	
Perform complete cycle of the valve.	7 days

The interval continues, whether or not the unit operation is in MODE 1,2 or 3 (the assumed Applicability of the associated LCO) between performances.

As the Note modifies the required performance of the Surveillance, the Note is construed to be part of the "specified Frequency." Should the 7 day interval be exceeded while operation is not in MODE 1, this Note allows entry into and operation in MODES 2 and 3 to perform the Surveillance. The Surveillance is still considered to be performed within the "specified Frequency" if completed prior to entering MODE 1. Therefore, if the Surveillance were not performed within the 7 day (plus the extension allowed by SR 3.0.2) interval, but operation was not in MODE 1, 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 result in entry into MODE 1.

Once the unit reaches MODE 1, the requirement for the Surveillance to be performed within its specified Frequency applies and would require that the Surveillance had been performed. If the Surveillance were not performed prior to entering MODE 1, there would then be a failure to perform a Surveillance within the specified Frequency, and the provisions of SR 3.0.3 would apply.

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-6SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<div>- NOTE - Not required to be met in MODE 3.</div>	
Verify parameter is within limits.	24 hours

Example 1.4-[6] specifies that the requirements of this Surveillance do not have to be met while the unit is in MODE 3 (the assumed Applicability of the associated LCO is MODES 1,2, and 3). The interval measurement for the Frequency of this Surveillance continues at all times, as described in Example 1.4-1. However, the Note constitutes an "otherwise stated" exception to the Applicability of this Surveillance. Therefore, if the Surveillance were not performed within the 24 hour interval (plus the extension allowed by SR 3.0.2), and the unit was in MODE 3, there would be no failure of the SR nor failure to meet the LCO. Therefore, no violation of SR 3.0.4 occurs when changing MODES to enter MODE 3, even with the 24 hour Frequency exceeded, provided the MODE change does not result in entry into MODE 2. Prior to entering MODE 2 (assuming again that the 24 hour Frequency were not met), SR 3.0.4 would require satisfying the SR.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 In MODES 1 and 2, the maximum local fuel pin centerline temperature shall be $\leq [5080 - (6.5 \times 10^{-3} \text{ MWD/MTU})^{\circ}\text{F}]$.

2.1.1.2 In MODES 1 and 2, the departure from nucleate boiling ratio shall be maintained greater than the limits of [1.3 for the BAW-2 correlation and 1.18 for the BWC correlation].

2.1.1.3 In MODES 1 and 2, Reactor Coolant System (RCS) core outlet temperature and pressure shall be maintained above and to the left of the SL shown in Figure 2.1.1-1.

2.1.2 Reactor Coolant System Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained $\leq [2750]$ psig.

2.2 SAFETY LIMIT VIOLATIONS

With any SL violation, the following actions shall be completed:

2.2.1 In MODE 1 or 2, if SL 2.1.1.1 or SL 2.1.1.2 is violated, be in MODE 3 within 1 hour.

2.2.2 In MODE 1 or 2, if SL 2.1.1.3 is violated, restore RCS pressure and temperature within limits and be in MODE 3 within 1 hour.

2.2.3 In MODE 1 or 2, if SL 2.1.2 is not met, restore compliance within limits and be in MODE 3 within 1 hour.

2.2.4 In MODES 3, 4, and 5, if SL 2.1.2 is not met, restore RCS pressure to $\leq [2750]$ psig within 5 minutes.

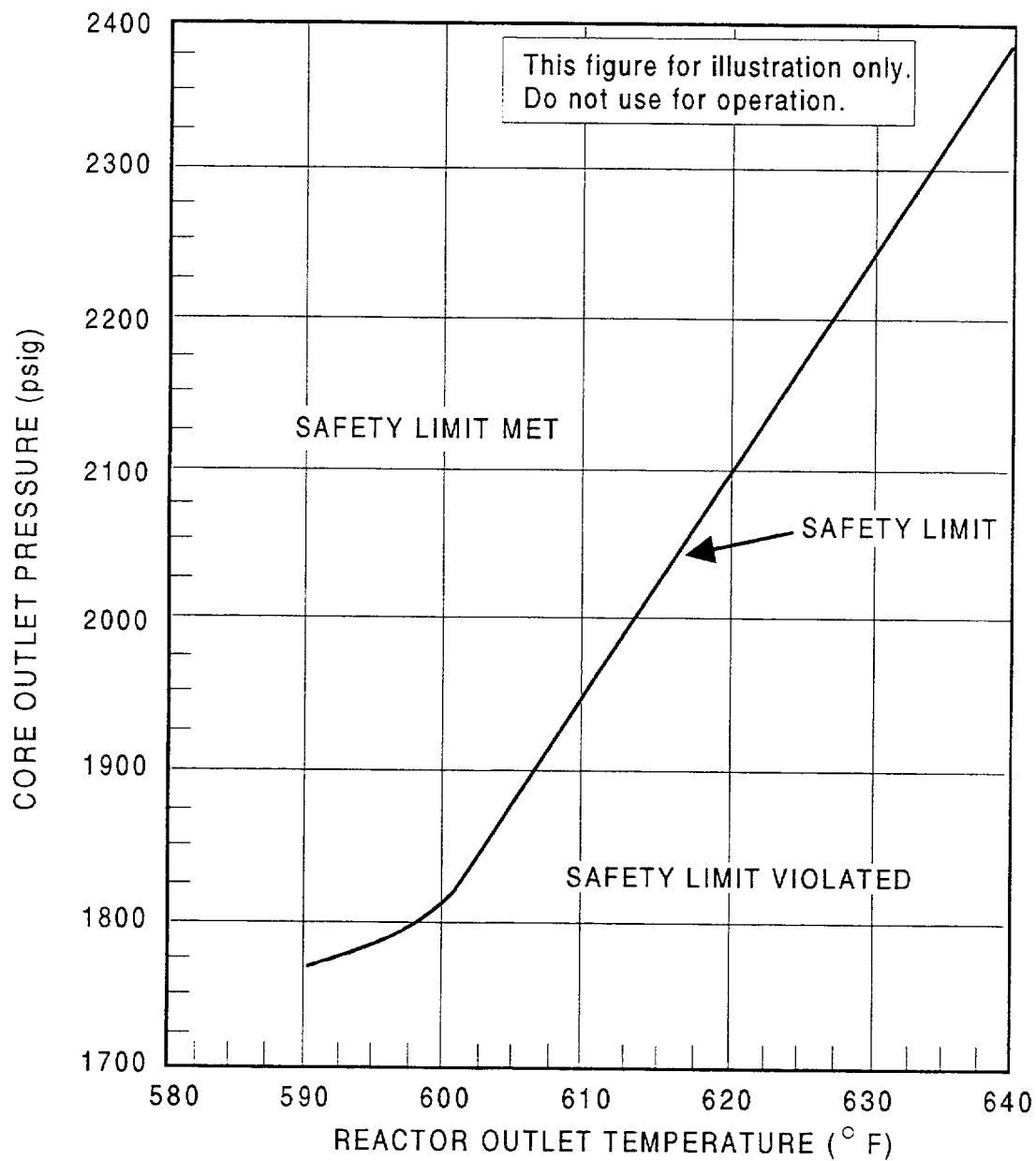


Figure 2.1.1-1 (page 1 of 1)
Reactor Coolant System Departure from Nucleate Boiling Safety Limits

3.0 LIMITING CONDITION 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 and LCO 3.0.7.
-----------	---

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 and LCO 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,
- 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 specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.
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Exceptions to this Specification are stated in the individual Specifications.

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.

3.0 LCO Applicability

LCO 3.0.4 (continued)

- REVIEWER'S NOTE -

LCO 3.0.4 has been revised so that changes in MODES or other specified conditions in the Applicability that are part of a shutdown of the unit shall not be prevented. In addition, LCO 3.0.4 has been revised so that it is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4. The MODE change restrictions in LCO 3.0.4 were previously applicable in all MODES. Before this version of LCO 3.0.4 can be implemented on a plant-specific basis, the licensee must review the existing technical specifications to determine where specific restrictions on MODE changes or Required Actions should be included in individual LCOs to justify this change; such an evaluation should be summarized in a matrix of all existing LCOs to facilitate NRC staff review of a conversion to the STS.

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 testing required to demonstrate OPERABILITY.
LCO 3.0.6	<p>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, an evaluation shall be performed in accordance with Specification 5.5.15, "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.</p> <p>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.</p>
LCO 3.0.7	Test Exception LCOs [3.1.9, 3.1.10, 3.1.11, and 3.4.19] allow specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified,

3.0 LCO Applicability

LCO 3.0.7 (continued)

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.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during the MODES or other specified conditions in the Applicability for 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 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, whichever 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 Condition(s) 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.

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability of an 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.

3.0 SR Applicability

SR 3.0.4 (continued)

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.

- REVIEWER'S NOTE -

SR 3.0.4 has been revised so that changes in MODES or other specified conditions in the Applicability that are part of a shutdown of the unit shall not be prevented. In addition, SR 3.0.4 has been revised so that it is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4. The MODE change restrictions in SR 3.0.4 were previously applicable in all MODES. Before this version of SR 3.0.4 can be implemented on a plant-specific basis, the licensee must review the existing technical specifications to determine where specific restrictions on MODE changes or Required Actions should be included in individual LCOs to justify this change; such an evaluation should be summarized in a matrix of all existing LCOs to facilitate NRC staff review of a conversion to the STS.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 The SDM shall be within the limits specified in the COLR.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM is within the limits specified in the COLR.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.1.2.1</p> <p style="text-align: center;">----- - NOTES - -----</p> <ol style="list-style-type: none"> 1. The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. 2. This Surveillance is not required to be performed prior to entry into MODE 2. <p style="text-align: center;">-----</p> <p>Verify measured core reactivity balance is within $\pm 1\% \Delta k/k$ of predicted values.</p>	<p>Prior to entering MODE 1 after each fuel loading</p> <p><u>AND</u></p> <p style="text-align: center;">----- - NOTE - -----</p> <p>Only required after 60 EFPD</p> <p style="text-align: center;">-----</p> <p>31 EFPD thereafter</p>

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.
The maximum positive limit shall be $[\leq [] \Delta k/k/^{\circ}F$ at RTP].

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MTC not within limits.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify MTC is within the upper limit specified in the COLR.	Prior to entering MODE 1 after each fuel loading
SR 3.1.3.2	<p style="text-align: center;">----- - NOTE - If the MTC is more negative than the COLR limit when extrapolated to the end of cycle, SR 3.1.3.2 may be repeated. Shutdown must occur prior to exceeding the minimum allowable boron concentration at which MTC is projected to exceed the lower limit. -----</p> <p>Verify extrapolated MTC is within the lower limit specified in the COLR.</p>	Each fuel cycle within 7 EFPDs after reaching an equilibrium boron concentration equivalent to 300 ppm

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 CONTROL ROD Group Alignment Limits

LCO 3.1.4 Each CONTROL ROD shall be OPERABLE.

AND

Each CONTROL ROD shall be aligned to within [6.5]% of its group average height.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CONTROL ROD not aligned to within [6.5]% of its group average height.	A.1 Restore CONTROL ROD alignment.	1 hour
	<u>OR</u>	
	A.2.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	<u>AND</u> Once per 12 hours thereafter
	A.2.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2.2 Reduce THERMAL POWER to $\leq 60\%$ of the ALLOWABLE THERMAL POWER.	2 hours
	<u>AND</u>	

CONTROL ROD Group Alignment Limits
3.1.4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.3 Reduce the nuclear overpower trip setpoint to $\leq 70\%$ of the ALLOWABLE THERMAL POWER.	10 hours
	<u>AND</u>	
	A.2.4 Verify the potential ejected rod worth is within the assumptions of the rod ejection analysis.	72 hours
	<u>AND</u>	
	A.2.5 ----- - NOTE - Only required when THERMAL POWER is >20% RTP. ----- Perform SR 3.2.5.1.	72 hours
B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3.	6 hours
C. More than one CONTROL ROD not aligned within [6.5]% of its group average height.	C.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	C.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	C.2 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more rods inoperable.	D.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	D.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual CONTROL ROD positions are within [6.5]% of their group average height.	12 hours
SR 3.1.4.2	Verify CONTROL ROD freedom of movement (trippability) by moving each individual CONTROL ROD that is not fully inserted $\geq 3\%$ in any direction.	92 days
SR 3.1.4.3	<p style="text-align: center;">----- - NOTE - -----</p> <p>With rod drop times determined with less than four reactor coolant pumps operating, operation may proceed provided operation is restricted to the pump combination operating during the rod drop time determination.</p> <p>-----</p> <p>Verify the rod drop time for each CONTROL ROD, from the fully withdrawn position, is $\leq [1.66]$ seconds from power interruption at the CONTROL ROD drive breakers to 3/4 insertion (25% withdrawn position) with $T_{avg} \geq 525^{\circ}\text{F}$.</p>	Prior to reactor criticality after each removal of the reactor vessel head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Safety Rod Insertion Limits

LCO 3.1.5 Each safety rod shall be fully withdrawn.

- NOTE -

Not required for any safety rod inserted to perform SR 3.1.4.2.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One safety rod not fully withdrawn.	A.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2 Declare the rod inoperable.	1 hour
B. More than one safety rod not fully withdrawn.	B.1.1 Verify SDM is within the limits specified in the COLR.	1 hour
	<u>OR</u>	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each safety rod is fully withdrawn.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

LCO 3.1.6 Each APSR shall be OPERABLE and aligned within [6.5]% of its group average height.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One APSR inoperable, not aligned within its limits, or both.	A.1 Perform SR 3.2.3.1.	2 hours <u>AND</u> 2 hours after each APSR movement
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.6.1 Verify position of each APSR is within [6.5]% of the group average height.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Position Indicator Channels

LCO 3.1.7 The absolute position indicator channel and the relative position indicator channel for each CONTROL ROD and APSR shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each inoperable position indicator channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The relative position indicator channel inoperable for one or more rods.	A.1 Determine the absolute position indicator channel for the rod(s) is OPERABLE.	8 hours <u>AND</u> Once per 8 hours thereafter
B. The absolute position indicator channel inoperable for one or more rods.	B.1.1 Determine position of the rods with inoperable absolute position indicator by actuating the affected rod's zone position reference indicators. <u>AND</u>	8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.1.2 Determine rods with inoperable position indicators are maintained at the zone reference indicator position and within the limits specified in LCO 3.1.5, "Safety Rod Insertion Limit," LCO 3.2.1, "Regulating Rod Insertion Limits," or LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits," as applicable.</p> <p><u>OR</u></p> <p>B.2.1 Place the control groups with nonindicating rods under manual control.</p> <p><u>AND</u></p>	<p>8 hours</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>8 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2.2 Determine the position of the nonindicating rods indirectly with fixed incore instrumentation.	<p>8 hours</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p><u>AND</u></p> <p>----- - NOTE - Not applicable during first 8 hours period -----</p> <p>1 hour after motion of nonindicating rods, which exceeds [15 inches] in one direction since the last determination of the rod's position</p>
<p>C. The absolute position indicator channel and the relative position indicator channel inoperable for one or more rods.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time not met.</p>	C.1 Declare the rod(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify the absolute position indicator channels and the relative position indicator channels agree within the limit specified in the COLR.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions - MODE 1

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

LCO 3.1.4, "CONTROL ROD Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits,"
LCO 3.1.6, "AXIAL POWER SHAPING ROD Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted
operation region only,
LCO 3.2.3, "AXIAL POWER IMBALANCE Operating Limits," and
LCO 3.2.4, "QUADRANT POWER TILT,"

may be suspended, provided:

- a. THERMAL POWER is maintained $\leq 85\%$ RTP,
- b. Nuclear overpower trip setpoint is $\leq 10\%$ RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP,

- NOTE -

- c. Only required when THERMAL POWER is $> 20\%$ RTP.

 $F_Q(Z)$ and $F_{\Delta H}^N$ are maintained within the limits specified in the COLR when THERMAL POWER is $> 20\%$ RTP, and

- d. SDM is within the limits specified in the COLR.

APPLICABILITY: MODE 1 during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes
	<u>AND</u> A.2 Suspend PHYSICS TESTS exceptions.	1 hour
B. THERMAL POWER > 85% RTP. <u>OR</u> Nuclear overpower trip setpoint > 10% higher than PHYSICS TESTS power level. <u>OR</u> Nuclear overpower trip setpoint > 90% RTP. <u>OR</u> $F_Q(Z)$ or $F_{\Delta H}^N$ not within limits when THERMAL POWER is > 20% RTP.	B.1 Suspend PHYSICS TESTS exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.8.1 Verify THERMAL POWER is \leq 85% RTP.	1 hour

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.8.2	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Only required when THERMAL POWER is >20% RTP.</p> <p>-----</p> <p>Perform SR 3.2.5.1.</p>	2 hours
SR 3.1.8.3	Verify nuclear overpower trip setpoint is \leq 10% RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP.	8 hours
SR 3.1.8.4	Verify SDM is within the limits specified in the COLR.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 PHYSICS TESTS Exceptions - MODE 2

LCO 3.1.9 During performance of PHYSICS TESTS, the requirements of:

LCO 3.1.3, "Moderator Temperature Coefficient,"
LCO 3.1.4, "CONTROL ROD Group Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits,"
LCO 3.1.6, "AXIAL POWER SHAPING ROD Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted
operation region only, and
[LCO 3.4.2, "RCS Minimum Temperature for Criticality"]

may be suspended provided that:

- a. THERMAL POWER is \leq 5% RTP,
- b. Reactor trip setpoints on the OPERABLE nuclear overpower channels are set to \leq 25% RTP,
- c. Nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit is OPERABLE, and
- d. SDM is within the limits specified in the COLR.

APPLICABILITY: During PHYSICS TESTS initiated in MODE 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER not within limit.	A.1 Open control rod drive trip breakers.	Immediately
B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit.	15 minutes
	<u>AND</u> B.2 Suspend PHYSICS TESTS exceptions.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Nuclear overpower trip setpoint is not within limit. <u>OR</u> Nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit inoperable.	C.1 Suspend PHYSICS TESTS exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify THERMAL POWER is \leq 5% RTP.	1 hour
SR 3.1.9.2	Verify nuclear overpower trip setpoint is \leq 25% RTP.	8 hours
SR 3.1.9.3	Verify SDM is within the limits specified in the COLR.	24 hours

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Regulating Rod Insertion Limits

LCO 3.2.1 Regulating rod groups shall be within the physical insertion, sequence, and overlap limits specified in the COLR.

- NOTE -

Not required for any regulating rod repositioned to perform SR 3.1.4.2.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Regulating rod groups inserted in restricted operational region, or sequence or overlap, or any combination, not met.	<p>A.1</p> <p style="text-align: center;">----- - NOTE - Only required when THERMAL POWER is >20% RTP. -----</p> <p>Perform SR 3.2.5.1.</p> <p><u>AND</u></p>	Once per 2 hours
	<p>A.2</p> <p>Restore regulating rod groups to within limits.</p>	24 hours from discovery of failure to meet the LCO
B. Required Action and associated Completion Time of Condition A not met.	<p>B.1</p> <p>Reduce THERMAL POWER to less than or equal to THERMAL POWER allowed by regulating rod group insertion limits.</p>	2 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Regulating rod groups inserted in unacceptable operational region.	C.1 Initiate boration to restore SDM to within the limit as specified in the COLR.	15 minutes
	<u>AND</u>	
	C.2.1 Restore regulating rod groups to within restricted operating region.	2 hours
	<u>OR</u>	
	C.2.2 Reduce THERMAL POWER to less than or equal to the THERMAL POWER allowed by the regulating rod group insertion limits.	2 hours
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify regulating rod groups are within the sequence and overlap limits as specified in the COLR.	12 hours
SR 3.2.1.2	Verify regulating rod groups meet the insertion limits as specified in the COLR.	12 hours
SR 3.2.1.3	Verify SDM is within the limit as specified in the COLR.	Within 4 hours prior to achieving criticality

3.2 POWER DISTRIBUTION LIMITS

3.2.2 AXIAL POWER SHAPING ROD (APSR) Insertion Limits

LCO 3.2.2 APSRs shall be positioned within the limits specified in the COLR.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. APSRs not within limits.	A.1 ----- - NOTE - Only required when THERMAL POWER is >20% RTP. ----- Perform SR 3.2.5.1. <u>AND</u>	Once per 2 hours
	A.2 Restore APSRs to within limits.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.2.1 Verify APSRs are within acceptable limits specified in the COLR.	12 hours

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL POWER IMBALANCE Operating Limits

LCO 3.2.3 AXIAL POWER IMBALANCE shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 40% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AXIAL POWER IMBALANCE not within limits.	A.1 Perform SR 3.2.5.1.	Once per 2 hours
	<u>AND</u>	
	A.2 Reduce AXIAL POWER IMBALANCE within limits.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to \leq 40% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AXIAL POWER IMBALANCE is within limits as specified in the COLR.	12 hours

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT (QPT)

LCO 3.2.4 QPT shall be maintained less than or equal to the steady state limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > [20]% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPT greater than the steady state limit and less than or equal to the transient limit.	A.1.1 Perform SR 3.2.5.1. <u>OR</u>	Once per 2 hours
	A.1.2.1 Reduce THERMAL POWER \geq 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. <u>AND</u>	2 hours <u>OR</u> 2 hours after last performance of SR 3.5.2.1
	A.1.2.2 Reduce nuclear overpower trip setpoint and nuclear overpower based on Reactor Coolant System flow and AXIAL POWER IMBALANCE trip setpoint \geq 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. <u>AND</u>	10 hours
	A.2 Restore QPT to less than or equal to the steady state limit.	24 hours from discovery of failure to meet the LCO

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. QPT greater than the transient limit and less than or equal to the maximum limit due to misalignment of a CONTROL ROD or an APSR.	B.1 Reduce THERMAL POWER \geq 2% RTP from ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit.	30 minutes
	<u>AND</u>	
	B.2 Restore QPT to less than or equal to the transient limit.	2 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Reduce THERMAL POWER to < 60% of the ALLOWABLE THERMAL POWER.	2 hours
	<u>AND</u>	
	C.2 Reduce nuclear overpower trip setpoint to \leq 65.5% of the ALLOWABLE THERMAL POWER.	10 hours
D. QPT greater than the transient limit and less than or equal to the maximum limit due to causes other than the misalignment of either CONTROL ROD or APSR.	D.1 Reduce THERMAL POWER to < 60% of the ALLOWABLE THERMAL POWER.	2 hours
	<u>AND</u>	
	D.2 Reduce nuclear overpower trip setpoint to \leq 65.5% of the ALLOWABLE THERMAL POWER.	10 hours
E. Required Action and associated Completion Time for Condition C or D not met.	E.1 Reduce THERMAL POWER to \leq [20]% RTP.	2 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. QPT greater than the maximum limit.	F.1 Reduce THERMAL POWER to \leq [20]% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.4.1 Verify QPT is within limits as specified in the COLR.	7 days <u>AND</u> When QPT has been restored to less than or equal to the steady state limit, 1 hour for 12 consecutive hours, or until verified acceptable at \geq 95% RTP

3.2 POWER DISTRIBUTION LIMITS

3.2.5 Power Peaking Factors

LCO 3.2.5 $F_Q(Z)$ and $F_{\Delta H}^N$ shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. $F_Q(Z)$ not within limit.	A.1 Reduce THERMAL POWER $\geq 1\%$ RTP for each 1% that $F_Q(Z)$ exceeds limit.	15 minutes
	<u>AND</u>	
	A.2 Reduce nuclear overpower trip setpoint and nuclear overpower based on Reactor Coolant System (RCS) flow and AXIAL POWER IMBALANCE trip setpoint $\geq 1\%$ RTP for each 1% that $F_Q(Z)$ exceeds limit.	8 hours
	<u>AND</u>	
	A.3 Restore $F_Q(Z)$ to within limit.	24 hours
B. $F_{\Delta H}^N$ not within limit.	B.1 Reduce THERMAL POWER $\geq RH(\%)$ RTP (specified in the COLR) for each 1% that $F_{\Delta H}^N$ exceeds limit.	15 minutes
	<u>AND</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2 Reduce nuclear overpower trip setpoint and nuclear overpower based on RCS flow and AXIAL POWER IMBALANCE trip setpoint \geq RH(%) RTP (specified in the COLR) for each 1% that $F_{\Delta H}^N$ exceeds limit.	8 hours
	<u>AND</u>	
	B.3 Restore $F_{\Delta H}^N$ to within limit.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 1 with THERMAL POWER \leq 20% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.5.1</p> <p style="text-align: center;">----- - NOTE - -----</p> <p>Only required to be performed when specified in LCO 3.1.8, "PHYSICS TESTS Exceptions - MODE 1," or when complying with Required Actions of LCO 3.1.4, "CONTROL ROD Group Alignment Limits," LCO 3.2.1, "Regulating Rod Insertion Limits," LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits," LCO 3.2.3, "AXIAL POWER IMBALANCE Operating Limits," LCO 3.2.4, "QUADRANT POWER TILT (QPT)."</p> <p style="text-align: center;">-----</p> <p>Verify $F_Q(Z)$ and $F_{\Delta H}^N$ are within limits by using the Incore Detector System to obtain a power distribution map.</p>	<p>As specified by the applicable LCO(s)</p>

3.3 INSTRUMENTATION

3.3.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1 Four channels of RPS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Place channel in bypass or trip.	1 hour
B. Two channels inoperable.	B.1 Place one channel in trip. <u>AND</u>	1 hour
	B.2 Place second channel in bypass.	1 hour
C. Three or more channels inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A or B not met.	C.1 Enter the Condition referenced in Table 3.3.1-1 for the Function.	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.1-1.	D.1 Be in MODE 3. <u>AND</u>	6 hours
	D.2 Open all CONTROL ROD drive (CRD) trip breakers.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action C.1 and referenced in Table 3.3.1-1.	E.1 Open all CRD trip breakers.	6 hours
F. As required by Required Action C.1 and referenced in Table 3.3.1-1.	F.1 Reduce THERMAL POWER < [45]% RTP.	6 hours
G. As required by Required Action C.1 and referenced in Table 3.3.1-1.	G.1 Reduce THERMAL POWER < [15]% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

- NOTE -

Refer to Table 3.3.1-1 to determine which SRs apply to each RPS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	<p>- NOTE -</p> <p>Not required to be performed until [24] hours after THERMAL POWER is \geq 15% RTP.</p> <p>Verify calorimetric heat balance is \leq [2]% RTP greater than power range channel output. Adjust power range channel output if calorimetric exceeds power range channel output by \geq [2]% RTP.</p>	24 hour

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.3	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Not required to be performed until [24] hours after THERMAL POWER is 15% RTP.</p> <p>-----</p> <p>Compare out of core measured AXIAL POWER IMBALANCE (API_o) to incore measured AXIAL POWER IMBALANCE (API_i) as follows:</p> <p>$(RTP/TP)(API_o - API_i) = \text{imbalance error}$</p> <p>Perform CHANNEL CALIBRATION if the absolute value of the imbalance error is $\geq [2]\%$ RTP.</p>	31 days
SR 3.3.1.4	Perform CHANNEL FUNCTIONAL TEST.	[45] days on a STAGGERED TEST BASIS
SR 3.3.1.5	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p>	[92] days
SR 3.3.1.6	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p>	[18] months
SR 3.3.1.7	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Neutron detectors are excluded from RPS RESPONSE TIME testing.</p> <p>-----</p> <p>Verify that RPS RESPONSE TIME is within limits.</p>	[18] months on a STAGGERED TEST BASIS

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Nuclear Overpower -				
a. High Setpoint	1,2 ^(a) ,3 ^(d)	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.5 SR 3.3.1.7	≤ [104.9]% RTP
b. Low Setpoint	2 ^(b) ,3 ^(b) 4 ^(b) ,5 ^(b)	E	SR 3.3.1.1 SR 3.3.1.5 SR 3.3.1.7	≤ 5% RTP
2. RCS High Outlet Temperature	1,2	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≤ [618]°F
3. RCS High Pressure	1,2 ^(a) ,3 ^(d)	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7	≤ [2355] psig
4. RCS Low Pressure	1,2 ^(a)	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7	≥ [1800] psig
5. RCS Variable Low Pressure	1,2 ^(a)	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≥ ([11.59] * T _{out} - [5037.8]) psig
6. Reactor Building High Pressure	1,2,3 ^(c)	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≤ [4] psig
7. Reactor Coolant Pump to Power	1,2 ^(a)	D	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7	[5]% RTP with ≤ 2 pumps operating

(a) When not in shutdown bypass operation.

(b) During shutdown bypass operation with any CRD trip breaker in the closed position and the CRD System capable of rod withdrawal.

(c) With any CRD trip breaker in the closed position and the CRD System capable of rod withdrawal.

(d) With any CRD trip breaker in the closed position, the CRD system capable of rod withdrawal, and not in shutdown bypass operation.

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Nuclear Overpower RCS Flow and Measured AXIAL POWER IMBALANCE	1,2 ^(a)	D	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.5 SR 3.3.1.6 SR 3.3.1.7	Nuclear Overpower RCS Flow and AXIAL POWER IMBALANCE setpoint envelope in COLR
9. Main Turbine Trip (Control Oil Pressure)	≥ [45]% RTP	F	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≥ [45] psig
10. Loss of Main Feedwater Pumps (Control Oil Pressure)	≥ [15]% RTP	G	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≥ [55] psig
11. Shutdown Bypass RCS High Pressure	2 ^(b) , 3 ^(b) , 4 ^(b) 5 ^(b)	E	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6	≤ [1720] psig

(a) When not in shutdown bypass operation.

(b) During shutdown bypass operation with any CRD trip breakers in the closed position and the CRD System capable of rod withdrawal.

3.3 INSTRUMENTATION

3.3.2 Reactor Protection System (RPS) Manual Reactor Trip

LCO 3.3.2 The RPS Manual Reactor Trip Function shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3, 4, and 5 with any CONTROL ROD drive (CRD) trip breaker in
the closed position and the CRD System capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Manual Reactor Trip Function inoperable.	A.1 Restore Function to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met in MODE 1, 2, or 3.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Open all CRD trip breakers.	6 hours
C. Required Action and associated Completion Time not met in MODE 4 or 5.	C.1 Open all CRD trip breakers.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.2.1 Perform CHANNEL FUNCTIONAL TEST.	Once prior to each reactor startup if not performed within the previous 7 days

3.3 INSTRUMENTATION

3.3.3 Reactor Protection System (RPS) - Reactor Trip Module (RTM)

LCO 3.3.3 Four RTMs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3, 4, and 5 with any CONTROL ROD drive (CRD) trip breaker in
the closed position and the CRD System capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RTM inoperable.	A.1.1 Trip the associated CRD trip breaker.	1 hour
	<u>OR</u>	
	A.1.2 Remove power from the associated CRD trip breaker.	1 hour
	<u>AND</u>	
	A.2 Physically remove the inoperable RTM.	1 hour
B. Two or more RTMs inoperable in MODE 1, 2, or 3.	B.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	B.2.1 Open all CRD trip breakers.	6 hours
	<u>OR</u>	
Required Action and associated Completion Time not met in MODE 1, 2, or 3.	B.2.2 Remove power from all CRD trip breakers.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two or more RTMs inoperable in MODE 4 or 5. <u>OR</u> Required Action and associated Completion Time not met in MODE 4 or 5.	C.1 Open all CRD trip breakers.	6 hours
	<u>OR</u> C.2 Remove power from all CRD trip breakers.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform CHANNEL FUNCTIONAL TEST.	[23] days on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.4 CONTROL ROD Drive (CRD) Trip Devices

LCO 3.3.4 The following CRD trip devices shall be OPERABLE:

- a. Two AC CRD trip breakers,
- b. Two DC CRD trip breaker pairs, and
- c. Eight electronic trip assembly (ETA) relays.

APPLICABILITY: MODES 1 and 2,
MODES 3, 4, and 5 when any CRD trip breaker is in the closed position
and the CRD System is capable of rod withdrawal.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each CRD trip device.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more CRD trip breaker(s) [or breaker pair] undervoltage or shunt trip Functions inoperable.	A.1 Trip the CRD trip breaker(s).	48 hours
	<u>OR</u> A.2 Remove power from the CRD trip breaker(s).	48 hours
B. One or more CRD trip breaker(s) [or breaker pair] inoperable for reasons other than those in Condition A.	B.1 Trip the CRD trip breaker(s).	1 hour
	<u>OR</u> B.2 Remove power from the CRD trip breaker(s).	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more ETA relays inoperable.	C.1 Transfer affected CONTROL ROD group to power supply with OPERABLE ETA relays.	1 hour
	<u>OR</u>	
	C.2 Trip corresponding AC CRD trip breaker.	1 hour
D. Required Action and associated Completion Time not met in MODE 1, 2, or 3.	D.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	D.2.1 Open all CRD trip breakers.	6 hours
	<u>OR</u>	
	D.2.2 Remove power from all CRD trip breakers.	6 hours
E. Required Action and associated Completion Time not met in MODE 4 or 5.	E.1 Open all CRD trip breakers.	6 hours
	<u>OR</u>	
	E.2 Remove power from all CRD trip breakers.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.4.1 Perform CHANNEL FUNCTIONAL TEST.	[23] days on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.5 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.5 Three channels of ESFAS instrumentation for each Parameter in Table 3.3.5-1 shall be OPERABLE in each ESFAS train.

APPLICABILITY: According to Table 3.3.5-1.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Parameter.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Parameters with one channel inoperable.	A.1 Place channel in trip.	1 hour
B. One or more Parameters with two or more channels inoperable. <u>OR</u>	B.1 Be in MODE 3. <u>AND</u>	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Required Action and associated Completion Time not met.	B.2.1 ----- - NOTE - Only required for RCS Pressure - Low setpoint. -----	36 hours
	Reduce RCS pressure < [1800] psig. <u>AND</u>	
	B.2.2 ----- - NOTE - Only required for RCS Pressure - Low Low setpoint. -----	36 hours
	Reduce RCS pressure < [900] psig. <u>AND</u>	
	B.2.3 ----- - NOTE - Only required for Reactor Building Pressure High setpoint and High High setpoint. -----	36 hours
	Be in MODE 5.	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform CHANNEL CHECK.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.2	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>When an ESFAS channel is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 8 hours, provided the remaining two channels of ESFAS instrumentation are OPERABLE or tripped.</p> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p>	31 days
SR 3.3.5.3	Perform CHANNEL CALIBRATION.	[18] months
SR 3.3.5.4	Verify ESFAS RESPONSE TIME within limits.	[18] months on a STAGGERED TEST BASIS

Table 3.3.5-1 (page 1 of 1)
Engineered Safety Feature Actuation System Instrumentation

PARAMETER	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	ALLOWABLE VALUE
1. Reactor Coolant System Pressure - Low Setpoint (HPI Actuation, RB Isolation, RB Cooling, EDG Start)	≥ [1800] psig	≥ [1600] psig
2. Reactor Coolant System Pressure - Low Low Setpoint (HPI Actuation, LPI Actuation, RB Isolation, RB Cooling)	≥ [900] psig	≥ [400] psig
3. Reactor Building (RB) Pressure - High Setpoint (HPI Actuation, LPI Actuation, RB Isolation, RB Cooling)	1,2,3,4	≤ [5] psig
4. Reactor Building Pressure - High High Setpoint (RB Spray Actuation)	1,2,3,4	≤ [30] psig

3.3 INSTRUMENTATION

3.3.6 Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

LCO 3.3.6 Two manual initiation channels of each one of the ESFAS Functions below shall be OPERABLE:

- a. High Pressure Injection,
- b. Low Pressure Injection,
- [c. Reactor Building (RB) Cooling,]
- [d. RB Spray,]
- e. RB Isolation, and
- [f. Control Room Isolation.]

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when associated engineered safeguard equipment is required to be OPERABLE.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more ESFAS Functions with one channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL FUNCTIONAL TEST.	[18] months

3.3 INSTRUMENTATION

3.3.7 Engineered Safety Feature Actuation System (ESFAS) Automatic Actuation Logic

LCO 3.3.7 All the ESFAS automatic actuation logic matrices shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when associated engineered safeguard equipment is required to
be OPERABLE.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each automatic actuation logic matrix.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more automatic actuation logic matrices inoperable.	A.1 Place associated component(s) in engineered safeguard configuration.	1 hour
	<u>OR</u>	
	A.2 Declare the associated component(s) inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform automatic actuation logic CHANNEL FUNCTIONAL TEST.	31 days on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.8 Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)

LCO 3.3.8 Three channels of loss of voltage Function and three channels of degraded voltage Function EDG LOPS instrumentation per EDG shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated EDG is required to be OPERABLE by LCO 3.8.2 "AC Sources - Shutdown."

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per EDG inoperable.	A.1 Place channel in trip.	1 hour
B. One or more Functions with two or more channels per EDG inoperable.	B.1 Restore all but one channel to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Enter applicable Condition(s) and Required Action for EDG made inoperable by EDG LOPS.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.8.1 Perform CHANNEL CHECK.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.8.2</p> <p style="text-align: center;">----- - NOTE - -----</p> <p>When EDG LOPS instrumentation is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed as follows: (a) up to 4 hours for the degraded voltage Function, and (b) up to 4 hours for the loss of voltage Function, provided the two channels monitoring the Function for the bus are OPERABLE or tripped.</p> <p style="text-align: center;">-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p>	<p>31 days</p>
<p>SR 3.3.8.3</p> <p>Perform CHANNEL CALIBRATION with setpoint Allowable Value as follows:</p> <p>a. Degraded voltage $\geq []$ and $\leq []$ V with a time delay of $[]$ seconds $\pm []$ seconds at $[]$ V and</p> <p>b. Loss of voltage $\geq []$ and $\leq []$ V with a time delay of $[]$ seconds $\pm []$ seconds at $[]$ V.</p>	<p>18 months</p>

3.3 INSTRUMENTATION

3.3.9 Source Range Neutron Flux

LCO 3.3.9 Two source range neutron flux channels shall be OPERABLE.

- NOTE -

High voltage to detector may be de-energized with neutron flux
1E-10 amp on intermediate range channels.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One source range neutron flux channel inoperable with neutron flux $\leq 1\text{E-}10$ amp on the intermediate range neutron flux channels.	A.1 Restore channel to OPERABLE status.	Prior to increasing neutron flux
B. Two source range neutron flux channels inoperable with neutron flux $\leq 1\text{E-}10$ amp on the intermediate range neutron flux channels.	----- - NOTE - Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. -----	
	B.1 Suspend operations involving positive reactivity changes.	Immediately
	<u>AND</u>	
	B.2 Initiate action to insert all CONTROL RODS.	Immediately
	<u>AND</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.3 Open CONTROL ROD drive trip breakers.	1 hour
	<u>AND</u> B.4 Verify SDM is within the limit as specified in the COLR.	1 hour <u>AND</u> Once per 12 hours thereafter
C. One or more source range neutron flux channel(s) inoperable with neutron flux > 1E-10 amp on the intermediate range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2	<p style="text-align: center;">- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>Perform CHANNEL CALIBRATION.</p>	[18] months

3.3 INSTRUMENTATION

3.3.10 Intermediate Range Neutron Flux

LCO 3.3.10 Two intermediate range neutron flux channels shall be OPERABLE.

APPLICABILITY: MODE 2,
MODES 3, 4, and 5 with any CONTROL ROD drive (CRD) trip breaker in
the closed position and the CRD System capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Reduce neutron flux to $\leq 1E-10$ amp.	2 hours
B. Two channels inoperable.	<p style="text-align: center;">----- - NOTE - Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. -----</p>	Immediately
	B.1 Suspend operations involving positive reactivity changes.	
	<p><u>AND</u></p> B.2 Open CRD trip breakers.	
		1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.10.1 Perform CHANNEL CHECK.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.10.2	<p>-----</p> <p>- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION.</p>	[18] months

3.3 INSTRUMENTATION

3.3.11 Emergency Feedwater Initiation and Control (EFIC) System Instrumentation

LCO 3.3.11 The EFIC System instrumentation channels for each Function in Table 3.3.11-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.11-1.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Emergency Feedwater (EFW) Initiation, Main Steam Line Isolation, or Main Feedwater (MFW) Isolation Functions listed in Table 3.3.11-1 with one channel inoperable.	A.1 Place channel(s) in bypass or trip.	1 hour
	<u>AND</u> A.2 Place channel(s) in trip.	72 hours
B. One or more EFW Initiation, Main Steam Line Isolation, or MFW Isolation Functions listed in Table 3.3.11-1 with two channels inoperable.	B.1 Place one channel in bypass.	1 hour
	<u>AND</u> B.2 Place second channel in trip.	1 hour
	<u>AND</u> B.3 Restore one channel to OPERABLE status.	72 hours
C. One EFW Vector Valve Control channel inoperable.	C.1 Restore channel to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Three or more channels inoperable for Functions 1.a or 1.b.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time not met for Functions 1.a or 1.b.</p>	D.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	<p>D.2.1 -----</p> <p style="text-align: center;">- NOTE -</p> <p>Only required for Function 1a.</p> <p>-----</p> <p>Open CONTROL ROD drive trip breakers.</p>	6 hours
	<p><u>AND</u></p> <p>D.2.2 -----</p> <p style="text-align: center;">- NOTE -</p> <p>Only required for Function 1b.</p> <p>-----</p> <p>Be in MODE 4.</p>	12 hours
<p>E. Three or more channels inoperable for Functions 1.d.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time not met for Function 1.d.</p>	E.1 Reduce THERMAL POWER to $\leq 10\%$ RTP.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Three or more channels inoperable for Functions 1.c, 2, 3, or 4. <u>OR</u> Required Action and associated Completion Time not met for Functions 1.c, 2, 3, or 4.	F.1 Reduce once through steam generator pressure to < 750 psig.	12 hours

SURVEILLANCE REQUIREMENTS

- NOTE -

Refer to Table 3.3.11-1 to determine which SRs shall be performed for each EFIC Function.

SURVEILLANCE		FREQUENCY
SR 3.3.11.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.11.2	Perform CHANNEL FUNCTIONAL TEST.	31 days
SR 3.3.11.3	Perform CHANNEL CALIBRATION.	[18] months
SR 3.3.11.4	Verify EFIC RESPONSE TIME is within limits.	[18] months on a STAGGERED TEST BASIS

Table 3.3.11-1 (page 1 of 2)
Emergency Feedwater Initiation and Control System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. EFW Initiation				
a. Loss of MFW Pumps (Control Oil Pressure)	1,2 ^(a) ,3 ^(a)	4	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	> [55] psig
b. SG Level - Low	1,2,3	4 per SG	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3 SR 3.3.11.4	≥ [9] inches
c. SG Pressure - Low	1,2,3 ^(b)	4 per SG	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	≥ [600] psig
d. RCP Status	≥ 10% RTP	4	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	NA
2. EFW Vector Valve Control				
a. SG Pressure - Low	1,2,3 ^(b)	4 per SG	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	≥ [600] psig
b. SG Differential Pressure - High	1,2,3 ^(b)	4	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	≤ [125] psid
c. [SG Level - High	1,2,3 ^(b)	4	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3	≤ [] inches]
3. Main Steam Line Isolation				
a. SG Pressure - Low	1,2,3 ^{(b)(c)}	4 per SG	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3 SR 3.3.11.4	≥ [600] psig

(a) When not in shutdown bypass.

(b) When SG pressure ≥ 750 psig.

(c) Except when all associated valves are closed and [deactivated].

Table 3.3.11-1 (page 2 of 2)
Emergency Feedwater Initiation and Control System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. MFW Isolation				
a. SG Pressure - Low	1,2,3 ^{(b)(d)}	4 per SG	SR 3.3.11.1 SR 3.3.11.2 SR 3.3.11.3 SR 3.3.11.4	≥ [600] psig

(b) When SG pressure ≥ 750 psig.

(d) Except when all [MFSVs], [MFCVs], [or associated SFCVs] are closed and [deactivated] [or isolated by a closed manual valve].

3.3 INSTRUMENTATION

3.3.12 Emergency Feedwater Initiation and Control (EFIC) Manual Initiation

LCO 3.3.12 Two manual initiation switches per actuation channel for each of the following EFIC Functions shall be OPERABLE:

- a. Steam generator (SG) A Main Feedwater (MFW) Isolation,
- b. SG B MFW Isolation,
- c. SG A Main Steam Line Isolation,
- d. SG B Main Steam Line Isolation, and
- e. Emergency Feedwater Actuation.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more EFIC Function(s) with one or both manual initiation switches inoperable in one actuation channel.	A.1 Place actuation channel for the associated EFIC Function(s) in trip.	72 hours
B. One or more EFIC Function(s) with one or both manual initiation switches inoperable in both actuation channels.	B.1 Restore one actuation channel for the associated EFIC Function(s) to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u>	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	Perform CHANNEL FUNCTIONAL TEST.	31 days

3.3 INSTRUMENTATION

3.3.13 Emergency Feedwater Initiation and Control (EFIC) Logic

LCO 3.3.13 Channels A and B of each Logic Function shown below shall be OPERABLE:

- a. Main Feedwater Isolation,
- b. Main Steam Line Isolation,
- c. Emergency Feedwater Actuation, and
- d. Vector Valve Enable Logic.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more channel A Functions inoperable with all channel B Functions OPERABLE.</p> <p><u>OR</u></p> <p>One or more channel B Functions inoperable with all channel A Functions OPERABLE.</p>	<p>A.1 Restore affected channel to OPERABLE status.</p>	72 hours
<p>B. Required Action and associated Completion Time not met.</p>	<p>B.1 Be in MODE 3.</p> <p><u>AND</u></p>	6 hours
	<p>B.2 Be in MODE 4.</p>	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.13.1	Perform CHANNEL FUNCTIONAL TEST.	31 days

3.3 INSTRUMENTATION

3.3.14 Emergency Feedwater Initiation and Control (EFIC) - Emergency Feedwater (EFW) - Vector Valve Logic

LCO 3.3.14 Four channels of the vector valve logic shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One vector valve logic channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.14.1 Perform a CHANNEL FUNCTIONAL TEST.	31 days

3.3 INSTRUMENTATION

3.3.15 Reactor Building (RB) Purge Isolation - High Radiation

LCO 3.3.15 [One] channel of Reactor Building Purge Isolation - High Radiation shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of [recently] irradiated fuel assemblies within the RB.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable in MODE 1, 2, 3, or 4.	A.1 Place and maintain RB purge valves in closed positions.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours
C. One channel inoperable during movement of [recently] irradiated fuel assemblies within the RB.	C.1 Place and maintain RB purge valves in closed positions.	Immediately
	<u>OR</u> C.2 Suspend movement of [recently] irradiated fuel assemblies within the RB.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.15.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.15.2	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.15.3	Perform CHANNEL CALIBRATION with setpoint Allowable Value \leq [25] mR/hr.	[18] months

3.3 INSTRUMENTATION

3.3.16 Control Room Isolation - High Radiation

LCO 3.3.16 [One] channel of Control Room Isolation - High Radiation shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, [5, and 6,]
During movement of [recently] irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable in MODE 1, 2, 3, or 4.	A.1 ----- - NOTE - Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. -----	1 hour
	Place one OPERABLE Control Room Emergency Ventilation System (CREVS) train in the emergency recirculation mode.	
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours
C. One channel inoperable during movement of [recently] irradiated fuel.	C.1 Place one OPERABLE CREVS train in emergency recirculation mode.	Immediately
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.2 Suspend movement of [recently] irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.16.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.16.2	<p>-----</p> <p>- NOTE -</p> <p>When the Control Room Isolation - High Radiation instrumentation is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 3 hours.</p> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p>	92 days
SR 3.3.16.3	Perform CHANNEL CALIBRATION with setpoint Allowable Value \leq [25] mR/hr.	[18] months

3.3 INSTRUMENTATION

3.3.17 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.17 The PAM instrumentation for each Function in Table 3.3.17-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTES -

1. LCO 3.0.4 is 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
D. Two required hydrogen monitor channels inoperable.	D.1 Restore one required hydrogen monitor channel to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Enter the Condition referenced in Table 3.3.17-1 for the channel.	Immediately
F. As required by Required Action E.1 and referenced in Table 3.3.17-1.	F.1 Be in MODE 3.	6 hours
	<u>AND</u> F.2 Be in MODE 4.	12 hours
G. As required by Required Action E.1 and referenced in Table 3.3.17-1.	G.1 Initiate action in accordance with Specification 5.6.7.	Immediately

SURVEILLANCE REQUIREMENTS

- NOTE -

These SRs apply to each PAM instrumentation Function in Table 3.3.17-1.

SURVEILLANCE		FREQUENCY
SR 3.3.17.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.17.2	<p>- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>Perform CHANNEL CALIBRATION.</p>	[18] months

Table 3.3.17-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1
1. Wide Range Neutron Flux	2	F
2. RCS Hot Leg Temperature	2 per loop	F
3. RCS Cold Leg Temperature	2 per loop	F
4. RCS Pressure (Wide Range)	2	F
5. Reactor Vessel Water Level	2	G
6. Containment Sump Water Level (Wide Range)	2	F
7. Containment Pressure (Wide Range)	2	F
8. Penetration Flow Path Containment Isolation Valve Position	2 per penetration flow path ^{(a)(b)}	F
9. Containment Area Radiation (High Range)	2	G
10. Containment Hydrogen Concentration	2	F
11. Pressurizer Level	2	F
12. Steam Generator Water Level	2 per SG	F
13. Condensate Storage Tank Level	2	F
14. Core Exit Temperature	2 independent sets of 5 ^(c)	F
15. Emergency Feedwater Flow	2	F

- REVIEWER'S NOTE -

Table 3.3.17-1 shall be amended for each unit as necessary to list all U.S. NRC Regulatory Guide 1.97, Type A instruments and all U.S. NRC Regulatory Guide 1.97, Category I, non-Type A instruments in accordance with the unit's U.S. NRC Regulatory Guide 1.97, Safety Evaluation Report.

- (a) 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.
- (b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.
- (c) The subcooling margin monitor takes the average of the five highest CETs for each of the ICCM trains.

3.3 INSTRUMENTATION

3.3.18 Remote Shutdown System

LCO 3.3.18 The Remote Shutdown System Functions shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTES -

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u>	6 hours
	B.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.18.1	[Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days]
SR 3.3.18.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	[18] month

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.18.3	<p>-----</p> <p>- NOTE -</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>-----</p> <p>Perform CHANNEL CALIBRATION for each required instrumentation channel.</p>	[18] 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 loop pressure, hot leg temperature, and RCS total flow rate shall be within the limits specified below:

a. With four reactor coolant pumps (RCPs) operating:

RCS loop pressure shall be \geq [2061.6] psig, RCS hot leg temperature shall be \leq [604.6]°F, and RCS total flow rate shall be \geq [139.7 E6] ^{1b}/hr, and

b. With three RCPs operating:

RCS loop pressure shall be \geq [2057.2] psig, RCS hot leg temperature shall be \leq [604.6]°F, and RCS total flow rate shall be \geq [104.4 E6] ^{1b}/hr.

APPLICABILITY: MODE 1.

- NOTES -

RCS loop 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	<p>-----</p> <p>- NOTE -</p> <p>With three RCPs operating, the limits are applied to the loop with two RCPs in operation.</p> <p>-----</p> <p>Verify RCS loop pressure \geq [2061.6] psig with four RCPs operating or \geq [2057.2] psig with three RCPs operating.</p>	12 hours
SR 3.4.1.2	<p>-----</p> <p>- NOTE -</p> <p>With three RCPs operating, the limits are applied to the loop with two RCPs in operation.</p> <p>-----</p> <p>Verify RCS hot leg temperature \leq [604.6] °F.</p>	12 hours
SR 3.4.1.3	Verify RCS total flow \geq [139.7 E6] lb/hr with four RCPs operating or \geq [104.4 E6] lb/hr with three RCPS operating.	12 hours
SR 3.4.1.4	<p>-----</p> <p>- NOTE -</p> <p>Only required to be performed when stable thermal conditions are established in the higher power range of MODE 1.</p> <p>-----</p> <p>Verify RCS total flow rate is within limit by measurement.</p>	[18] 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 $\geq 525^{\circ}\text{F}$.

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 2 with $K_{eff} < 1.0$.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 Verify RCS T_{avg} in each loop $\geq 525^{\circ}\text{F}$.	12 hours

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 parameter(s) to within limits.	30 minutes
	AND A.2 Determine RCS is acceptable for continued operation.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	6 hours
	AND B.2 Be in MODE 5.	36 hours
C. ----- - NOTE - Required Action C.2 shall be completed whenever this Condition is entered. ----- Requirements of LCO not met in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limit.	Immediately
	AND C.2 Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.4.3.1</p> <hr/> <p style="text-align: center;">- NOTE -</p> <p>Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing.</p> <hr/> <p>Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.</p>	<p>30 minutes</p>

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops - MODES 1 and 2

LCO 3.4.4

Two RCS Loops shall be in operation, with:

- a. Four reactor coolant pumps (RCPs) operating or
- b. Three RCPs operating and THERMAL POWER restricted to [79.9]% RTP.

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 required RCS loops are in operation.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops - MODE 3

LCO 3.4.5 Both RCS loops shall be OPERABLE and one RCS loop shall be in operation.

- NOTE -

All [Both] reactor coolant pumps (RCPs) may be not in operation for ≤ 8 hours per 24 hours period for the transition to or from the Decay Heat Removal System, and all [both] RCPs may be de-energized for ≤ 1 hour per 8 hours period for any other reason, provided:

- a. No operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1 and
 - b. Core outlet temperature is maintained at least $[10]^{\circ}\text{F}$ below saturation temperature.
-

APPLICABILITY: MODE 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RCS loop inoperable.	A.1 Restore RCS loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 4.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two RCS loops inoperable. <u>OR</u> Required RCS loop not in operation.	C.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	<u>AND</u> C.2 Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify one RCS loop is in operation.	12 hours
SR 3.4.5.2	----- <p style="text-align: center;">- NOTE -</p> Not required to be performed until 24 hours after a required pump is not in operation. ----- Verify correct breaker alignment and indicated power available to each required pump.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops - MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and decay heat removal (DHR) loops shall be OPERABLE and one loop shall be in operation.

- NOTE -

All reactor coolant pumps (RCPs) may be not in operation for ≤ 8 hours per 24 hours period for the transition to or from the DHR System, and all RCPs and DHR pumps may be de-energized for ≤ 1 hour per 8 hours period for any other reason, provided:

- a. No operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1 and
 - b. Core outlet temperature is maintained at least 10°F below saturation temperature.
-

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required loop inoperable.	A.1 Initiate action to restore a second loop to OPERABLE status.	Immediately
	<p><u>AND</u></p> <p>A.2 ----- - NOTE - Only required if one DHR loop is OPERABLE. ----- Be in MODE 5.</p>	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two required loops inoperable. <u>OR</u> No required loop in operation.	B.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	<u>AND</u> B.2 Initiate action to restore one loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify required DHR or RCS loop is in operation.	12 hours
SR 3.4.6.2	----- <p style="text-align: center;">- NOTE -</p> Not required to be performed until 24 hours after a required pump is not in operation. ----- Verify correct breaker alignment and indicated power available to each required pump.	7 days

3.4.7 RCS Loops - MODE 5, Loops Filled

- LCO 3.4.7 One decay heat removal (DHR) loop shall be OPERABLE and in operation, and either:
- a. One additional DHR loop shall be OPERABLE or
 - b. The secondary side water level of each steam generator (SG) shall be \geq [50]%.

- NOTES -

1. The DHR pump of the loop in operation may be not in operation for \leq 1 hour per 8 hour period provided:
 - a. No operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1 and
 - b. Core outlet temperature is maintained at least 10°F below saturation temperature.
 2. One required DHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other DHR loop is OPERABLE and in operation.
 3. All DHR loops may not be in operation during planned heatup to MODE 4 when at least one RCS loop is in operation.
-

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One required DHR loop inoperable.</p> <p><u>AND</u></p> <p>One DHR loop OPERABLE.</p>	<p>A.1 Initiate action to restore a second DHR loop to OPERABLE status.</p>	Immediately
	<p><u>OR</u></p> <p>A.2 Initiate action to restore required SGs secondary side water levels to within limits.</p>	Immediately
<p>B. One or more required SGs with secondary side water level not within limit.</p> <p><u>AND</u></p> <p>One DHR loop OPERABLE.</p>	<p>B.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.</p>	Immediately
	<p><u>OR</u></p> <p>B.2 Initiate action to restore required SGs secondary side water level to within limit.</p>	Immediately
<p>C. No required DHR loop OPERABLE.</p> <p><u>OR</u></p> <p>Required DHR loop not in operation.</p>	<p>C.1 Suspend all operations involving a reduction in RCS boron concentration.</p>	Immediately
	<p><u>AND</u></p> <p>C.2 Initiate action to restore one DHR loop to OPERABLE status and operation.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify required DHR loop is in operation.	12 hours
SR 3.4.7.2	Verify required SG secondary side water levels are \geq [50]%. -----	12 hours
SR 3.4.7.3	<p style="text-align: center;">----- - NOTE - -----</p> <p>Not required to be performed until 24 hours after a required pump is not in operation.</p> <p>-----</p> <p>Verify correct breaker alignment and indicated power available to each required DHR pump.</p>	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops - MODE 5, Loops Not Filled

LCO 3.4.8 Both decay heat removal (DHR) loops shall be OPERABLE and one DHR loop shall be in operation.

- NOTES -

1. All DHR pumps may be not in operation for ≤ 15 minutes when switching from one loop to another provided:
 - [a. The maximum RCS temperature is $\leq [160]^{\circ}\text{F}$,]
 - b. No operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SDM of LCO 3.1.1 and
 - c. No draining operations to further reduce the RCS water volume are permitted.
 2. One DHR loop may be inoperable for ≤ 2 hours for surveillance testing provided that the other DHR loop is OPERABLE and in operation.
-

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required DHR loop inoperable.	A.1 Initiate action to restore DHR loop to OPERABLE status.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No required DHR loop OPERABLE. <u>OR</u> Required DHR loop not in operation.	B.1 Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	<u>AND</u> B.2 Initiate action to restore one DHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one DHR loop is in operation.	12 hours
SR 3.4.8.2	----- <p style="text-align: center;">- NOTE -</p> Not required to be performed until 24 hours after a required pump is not in operation. ----- Verify correct breaker alignment and indicated power available to each required DHR pump.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

- a. Pressurizer water level \leq [290] inches and
- b. A minimum of [126] kW of pressurizer heaters OPERABLE [and capable of being powered from an emergency power supply].

- NOTE -

OPERABILITY requirements on pressurizer heaters do not apply in
MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with RCS temperature \geq [275]°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Restore level to within limit.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. <u>AND</u>	6 hours
	B.2 Be in MODE 4 with RCS temperature \leq [275]°F.	[24] hours
C. Capacity of pressurizer heaters [capable of being powered by emergency power supply] less than limit.	C.1 Restore pressurizer heater capability.	72 hours

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.	6 hours
	<u>AND</u>	
	D.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level \leq [290] inches.	12 hours
SR 3.4.9.2	[Verify \geq [126] kW of pressurizer heaters are capable of being powered from an emergency power supply.	[18] months]
SR 3.4.9.3	[Verify emergency power supply for pressurizer heaters is OPERABLE.	[18] months]

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Two pressurizer safety valves shall be OPERABLE with lift settings \geq [2475] psig and \leq [2525] psig.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures $>$ [283]°F.

- NOTE -

The lift settings are not required to be within the LCO limits for entry into 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.	B.1 Be in MODE 3.	6 hours
<u>OR</u>	<u>AND</u>	
Two pressurizer safety valves inoperable.	B.2 Be in MODE 4 with any RCS cold leg temperature \leq [283]°F.	[24] hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within $\pm 1\%$.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valve (PORV)

LCO 3.4.11 The PORV and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. PORV inoperable.	A.1 Close block valve.	1 hour
	<u>AND</u>	
	A.2 Remove power from block valve.	1 hour
B. Block valve inoperable.	B.1 Close block valve.	1 hour
	<u>AND</u>	
	B.2 Remove power from block valve.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	<p>-----</p> <p>- NOTE -</p> <p>Not required to be performed with block valve closed in accordance with the Required Actions of this LCO.</p> <p>-----</p> <p>Perform one complete cycle of the block valve.</p>	92 days
SR 3.4.11.2	Perform one complete cycle of the PORV.	18 months
SR 3.4.11.3	[Verify PORV and block valve are capable of being powered from an emergency power source.	18 months]