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Vol. 1

Standard Technical Specifications
Westinghouse Plants

Specifications

Draft Report for Comment

Issued by the
U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

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PREFACE

This DRAFT NUREG presents the results of the Nuclear Regulatory Commission (NRC) staff review of the Westinghouse Owners Group (WOG) proposed new Standard Technical Specifications (STS). These new STS were developed based on the criteria in the interim Commission Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, dated February 6, 1987.

The new STS will be used as bases for developing improved plant-specific technical specifications by individual nuclear power plant owners that have PWRs designed by Westinghouse. The NRC staff is issuing this draft new STS for a 30 working-day comment period. Following the comment period, the NRC staff will analyze comments received, finalize the new STS, and issue them for plant-specific implementation.

Comments should be submitted no later than March 15, 1991, in accordance with the following guidance: The exact wording of each proposed change should be marked in pen and ink on copies of all the affected pages of DRAFT NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Each proposed change should be numbered. Each proposed change should be accompanied with a separate technical justification, cross referenced to the applicable proposed change on the marked up pages.

Submit written comments to: David L. Meyer, Chief, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U. S. Nuclear Regulatory Commission, Washington, DC 20555. Hand deliver comments to: 7920 Norfolk Avenue, Bethesda, Maryland, between 7:45 a.m. and 4:15 p.m. on Federal workdays.

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1.0 USE AND APPLICATION

1.1 Definitions

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

Term	Definition
ACTIONS	ACTIONS shall be that part of a specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
ACTUATION LOGIC TEST	An ACTUATION LOGIC TEST shall be the application of various simulated input combinations in conjunction with each possible interlock logic state and the verification of the required logic output. The ACTUATION LOGIC TEST, as a minimum, shall include a continuity check of output devices.
ALLOWABLE VALUE	The least conservative value of the process variable at which trip actions must occur. The ALLOWABLE VALUE is measured at the point in the channel defined by the plant-specific setpoint calculations. Surveillance test procedures define specific acceptance criteria that relate to the ALLOWABLE VALUE. Operation with actual trip values less conservative than nominal trip setpoints is acceptable since an allowance has been made in the setpoint analysis to accommodate this error. Determination of channel inoperability is not the simple exceeding of the ALLOWABLE VALUE, but rather it is the verification that the setpoint calculation's total allowance for instrument and process measurement uncertainties is not exceeded.

(continued)

ANALOG CHANNEL OPERATIONAL TEST (ACOT)	An ACOT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of alarm, interlock, and trip functions. The ACOT shall include adjustments, as necessary, of the alarm, interlock, and trip setpoints so that the setpoints are within the required range and accuracy.
AXIAL FLUX DIFFERENCE (AFD)	AFD shall be the difference in normalized flux signals between the [top and bottom halves of a two-section excore neutron detector].
CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel so that it responds within the required range and accuracy to known input. The CHANNEL CALIBRATION shall encompass the entire channel, including the sensor, alarm, interlock, and trip functions. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping calibrations or total channel steps so that the entire channel is calibrated. [Each facility shall describe here what the calibration of instrument channels with resistance temperature detectors or thermocouple sensors consists of.]
CHANNEL CHECK	A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications and/or status derived from independent instrument channels measuring the same parameter.
CORE ALTERATION	CORE ALTERATION shall be the movement of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

(continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit-specific document that provides core operating limits for the current reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 5.9.1.6. Plant operation within these core operating 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, 1988].
$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ 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 greater than [15] minutes, making up at least 95% of the total non-iodine activity in the coolant.
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 any series of sequential, overlapping, or total steps so that the entire response time is measured.

(continued)

LEAKAGE — LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE (except reactor coolant pump seal water injection or leakoff), such as pump seal or valve packing leaks, that is captured and conducted to collection systems or a sump or collecting tank,

2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of LEAKAGE detection systems or not to be Pressure Boundary LEAKAGE,

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

b. Pressure boundary LEAKAGE

LEAKAGE (except SG tube LEAKAGE) through a non-isolable fault in a RCS component body, pipe wall, or vessel wall; or

c. Unidentified LEAKAGE

All LEAKAGE (except reactor coolant pump seal water injection or leakoff) that is not identified LEAKAGE.

MASTER RELAY TEST — A MASTER RELAY TEST shall consist of energizing each master relay and verifying the OPERABILITY of each relay. The MASTER RELAY TEST shall include a continuity check of each associated slave relay.

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

(continued)

OPERABLE - OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication, or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure nuclear characteristics important to validate the safety analyses. 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 Commission.
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the facility-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 5.9.1.7. Plant operation within these operating limits is addressed in LCO 3.4.3, "Reactor Coolant System Pressure and Temperature Limits."
QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater. If one excore detector is inoperable, the remaining three detectors shall be used for computing the average.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of [ ] MWt.

(continued)

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 loss of stationary gripper coil voltage. The response time may be measured by any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All full-length rod cluster assemblies (shutdown and regulating) are fully inserted except for the single assembly of highest reactivity worth, which is assumed to be fully withdrawn; b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the [nominal zero power design level]; c. In addition, with a rod cluster assembly not capable of being fully inserted, the reactivity worth of this assembly must be accounted for in the determination of SDM; and [d. No change in part length rod cluster assembly position.]
SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing each slave relay and verifying the OPERABILITY of each slave relay. The SLAVE RELAY TEST shall include, as a minimum, a continuity check of associated testable actuation devices.
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 specified Surveillance Frequency so that all systems, subsystems, channels, or other

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STAGGERED TEST BASIS (continued)	designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TRIP ACTUATING DEVICE OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST shall consist of operating the trip actuating device and verifying OPERABILITY of alarm, interlock, and trip functions. The TRIP ACTUATING DEVICE OPERATIONAL TEST shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the required accuracy.

(continued)

Table 1.1-1
MODES

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

[a] Excluding decay.

[b] This temperature shall be the design temperature for operation of the decay-heat removal system.

[c] Fuel in the reactor vessel with one or more reactor vessel head closure bolts less than fully tensioned or with the head removed.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

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

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

BACKGROUND

Up to four levels of logic are used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The second level of logic is identified by the second digit of the Required Action number and an indention of the logical connector to the second level of nesting. The third and fourth levels of logic are identified by the third and fourth digits of the Required Action number and additional indentation of the logical connector to the third and fourth levels of nesting, respectively.

When logical connectors are used to state a Condition, usually only the first level of logic is used, and the logical connector is left justified with the Condition statement. In a few cases, the second level of logic is used. This is identified solely by indenting the logical connector, since subparts of a Condition statement are not numbered separately.

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

(continued)

EXAMPLES

The following examples illustrate the use of logical connectors in stating Required Actions. The use of the logical connectors in stating Conditions, Completion Times, and Frequencies is illustrated by examples in Sections 1.3 and 1.4 as needed.

EXAMPLE 1.2-1

ACTIONS

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

This example demonstrates that for Condition A, both Required Actions must be completed. This is because of the logical connector AND.

(continued)

(continued)

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

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

This example is a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices as indicated by the use of logical connector OR and because the ORs are left justified (first level of nesting). 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 indented to the second level of nesting. Required Action A.2.2 is met by choosing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR to the third level of nesting indicates that A.2.2.1 and A.2.2.2 are alternative choices, 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. Because LCOs have been prepared to be consistent with the Completion Time convention, compliance with it is mandatory.
BACKGROUND	LCOs specify minimum requirements for assuring safe operation of the facility. The ACTIONS associated with an LCO state Conditions that usually describe most of the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Actions and Completion Times. The Completion Time is the amount of time allowed to complete a Required Action. It is referenced to the time of discovery of a situation (e.g., inoperable equipment or variable outside specified limits) that requires entering an LCO ACTIONS Condition, provided that the facility is in a MODE or other specified condition stated in the Applicability of the LCO. A Required Action must be completed prior to the expiration of the specified Completion Time. Concurrent entry into all applicable ACTIONS Conditions is a requirement to be followed in each LCO. The amount of time that a facility can continue to operate with an applicable LCO not met is limited by the following principle, unless otherwise justified. The Completion Time for ultimately restoring compliance with an LCO is measured from the time it was initially discovered that the LCO was not met, and is limited to the longest Completion Time specified for correcting a Condition (e.g., restore equipment to OPERABLE status) among the Conditions entered concurrently. Adherence to this principle is accomplished by the use of "Condition-based" Completion Time clocks. Facility operation with an LCO not met entails an increased risk to safety. Keeping Completion Time clocks on a Condition basis assures that this risk will be maintained below an acceptable level.

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BACKGROUND (continued)

The implementation of Completion Time on a Condition basis is straightforward for most LCOs. There are a few LCOs, however, with ACTIONS that include several Conditions, and such Conditions may specify various Required Actions, each with a separate Completion Time. In order to provide guidance for the use of Condition-based Completion Time clocks for the simple as well as the more complex LCO ACTIONS, rules are established. These rules constitute the Completion Time convention.

COMPLETION TIME CONVENTION RULES

The Completion Time convention rules of the Technical Specifications (TS) address the following key issues and situations:

a. Independence of the ACTIONS for separate LCOs;

b. Starting a Completion Time clock;

c. Concurrent entry into more than one Condition in an LCO's ACTIONS; and

d. Resetting a Completion Time clock.

The examples discussed after the rules illustrate how the rules apply to the various types of LCO ACTIONS that occur in the TS. Following the examples is a listing of the various terms that are used to refer to various kinds of Conditions, Required Actions, and Completion Times. Use of these terms facilitates discussion about Completion Times.

These rules are consistent with the general Specifications, LCOs 3.0.1 through 3.0.5, and SRs 3.0.1 through 3.0.4. Exceptions to these specifications are noted when they are also exceptions to the Completion Time convention rules.

Some of the individual LCOs include Notes to convey exceptions to the Completion Time convention rules and to clarify for emphasis how the Completion Time convention rules must be interpreted for a given LCO.

1.3.1 Independence of the ACTIONS for separate LCOs.

Compliance with the ACTIONS of an entered LCO can usually be accomplished independently of the ACTIONS of any other LCO

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COMPLETION TIME CONVENTION RULES (continued)

entered concurrently. Exceptions to this are stated in the individual specifications. Notwithstanding these exceptions, the TS do not in general limit the number of LCOs that can be entered concurrently.

Whenever the performance of a Required Action conflicts with another Required Action required to be performed at the same time, whether these Actions are in the same or separate LCO ACTIONS, the more conservative Action shall be taken. (See Examples 1.3.3-3 and 1.3.4-1.)

1.3.2 Starting a Completion Time clock.

The Completion Time specified for the performance of a Required Action begins upon discovery of a failure to meet the LCO noted in the associated Condition, provided that the facility is in a MODE or other specified condition stated in the Applicability of the LCO. (See Example 1.3.2-1.)

If the facility is outside the Applicability of an LCO when it is discovered that the state of the facility corresponds to a Condition stated in the ACTIONS of that LCO, and entry into an applicable MODE or other specified condition is permitted (even though all the prerequisites for entry are not satisfied) by an exception to LCO 3.0.4 or SR 3.0.4, then the Completion Time begins upon the LCO becoming applicable, unless stated otherwise in the individual LCOs. (See Examples 1.3.2-2 through 1.3.2-5.)

1.3.3 Concurrent entry into more than one Condition in an LCO's ACTIONS.

Multiple entry into an LCO's ACTIONS is required. Upon initial entry into an LCO's ACTIONS, all of the stated individual Conditions that the facility is known to be in must be entered immediately. The Completion Time clocks for the associated Required Actions begin at the same time, but are tracked separately. (See Examples 1.3.3-1 through 1.3.3-3 and 1.3.4-1.)

If, prior to restoring compliance with the LCO, the facility is discovered to be in additional individual Conditions, then the Completion Time clock for each associated Required Action begins upon discovery.

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COMPLETION TIMES CONVENTION RULES (continued)

One entry Condition for LCO 3.0.3 is when an LCO's ACTIONS do not provide a Condition that corresponds to the state of the facility. LCO 3.0.3 is not required to be entered as long as two or more of the stated individual Conditions together correspond to the state of the facility. (See Examples 1.3.3-3 and 1.3.4-2.)

The Completion Time for ultimately restoring compliance with an LCO or complying with an unlimited remedial Required Action is limited to the longest Completion Time specified for a restoration Required Action of the individually designated Conditions that are concurrently entered, except as follows:

If the entered Conditions are not encompassed by another individually stated Condition in the same LCO's ACTIONS, then the Required Actions and Completion Times for the entered Conditions can be treated as if they were specified by separate LCO ACTIONS (Example 1.3.3-3), unless stated otherwise in the individual LCO. In such cases, compliance with the LCO is restored when all of the individual and independent Conditions are no longer applicable.

1.3.4 Resetting a Completion Time clock.

The Completion Time clock for each Required Action specified for an entered Condition is reset when one or more of the following occur:

a. The Required Action is completed;

b. The entered Condition is corrected by completion of a restoration Action;

c. An unlimited remedial Action, if specified for the entered Condition, is met; or

d. The entered Condition is no longer applicable either because the facility is outside the Applicability of the associated LCO, or because the state of the facility no longer corresponds to the entered Condition.

In addition, the Completion Time clocks for the shutdown Actions of default Conditions and LCO 3.0.3 are reset when corrective measures are completed that permit facility

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COMPLETION TIMES CONVENTION RULES (continued)

operation in accordance with the ACTIONS of the entered LCO(s), or when compliance with the entered LCO(s) is restored, or both. (See Examples 1.3.4-1 through 1.3.4-3.)

EXAMPLES

EXAMPLE 1.3.2-1

APPLICABILITY: MODES 1, 2, 3, and 4.
{VS-GE: MODES 1, 2, and 3.}

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required DC power subsystem inoperable.	A.1 Restore DC power subsystem to OPERABLE status.	2 hours

The other Required Actions stated for Condition A of this LCO are omitted for brevity.

If the facility is in an applicable MODE, and one DC power subsystem is discovered to be inoperable, then Condition A is entered and the 2-hour Completion Time clock starts immediately. Entry into MODE 4 {VS-GE: MODE 3} during facility startup with one DC power subsystem inoperable would not be allowed by LCO 3.0.4.

Note: Required Action A.1 is referred to as a "*restoration Action*." (See the list of terms following the Examples.) The Completion Time associated with a restoration Action is commonly referred to as the "*allowed outage time*," or "*AOT*."

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EXAMPLES (continued)

EXAMPLE 1.3.2-2

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One train inoperable.	A.1	-----NOTE----- LCO 3.0.4 is not applicable. --------------	
		Restore 1 train to OPERABLE status.	30 days

This example LCO ACTIONS is a simplified generalization for the purpose of discussing Completion Time convention rule 1.3.2 where there is an exception to LCO 3.0.4.

When one train is inoperable with the facility in MODE 3, entry into MODES 1 and 2 would be permitted because of the exception to LCO 3.0.4 stated in the ACTIONS. Upon entering MODE 2, the 30-day Completion Time clock would start immediately.

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EXAMPLES (continued)

EXAMPLE 1.3.2-3a {VS-B&W, CE, and W}

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
			-------NOTE----- Completion Time is on a Condition basis ---------------
A. One or more components inoperable. AND At least 100% of the safety injection flow equivalent to a single OPERABLE Emergency Core Cooling System (ECCS) train available.	A.1	Restore components to OPERABLE status.	72 hours

Condition A is an example of a *"multiple-situation Condition."* Such Conditions contain the words, "one or more." (Conditions that state, "one or two," are also included.) The Completion Time clock(s) for the Required Action(s) of such Conditions can be kept in one of two possible ways, referred to as *"Condition-based clocks"* and *"function-based clocks."* Condition-based clocks are the rule for most LCO ACTIONS and for this example.

When a Condition-based clock is used, there is only one Completion Time clock for the Required Action to correct the entered Condition, the *"restoration Action,"* and it starts upon discovery of a failure to meet the LCO noted in the associated Condition. In this example, if a single valve in an ECCS flow path is determined to be inoperable, the

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EXAMPLES (continued)

EXAMPLE 1.3.2-3a (VS-B&W, CE, and W) (continued)

72-hour Completion Time clock starts and Condition A is entered. If another valve in the same train (to ensure the second part of the statement of Condition A is true) is subsequently found to be inoperable, then Condition A is still applicable; no new clock based on the second valve is kept. Even if the first valve is restored to OPERABLE status, the original Condition-based clock continues to run.

The reason for the use of Condition-based clocks is to limit how long facility operation can continue at risk with an LCO not met.

Condition A includes a Note to emphasize the importance of using a Condition-based Completion Time to ensure that one or more failures impacting the capability of the ECCS to perform its specified function are corrected within the allowed 72-hour Completion Time, and thus, minimizing how long facility operation can continue to be vulnerable to single failures.

EXAMPLE 1.3.2-3a (VS-GE)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more jet pumps inoperable.	A.1 Be in MODE 3.	-------NOTE---- Completion Time is on a Condition basis --------------- 12 hours

Condition A is an example of a *"multiple-situation Condition."* Such Conditions contain the words "one or more." (Conditions that state "one or two" are also

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EXAMPLES (continued)

<u>EXAMPLE 1.3.2-3a</u> (VS-GE) (continued)

included.) The Completion Time clock(s) for the Required Action(s) of such Conditions can be kept in one of two possible ways, referred to as "*Condition-based clocks*," and "*function-based clocks*." Condition-based clocks are the rule for most LCO ACTIONS and for this example.

When a Condition-based clock is used, there is only one Completion Time clock for the Required Action to correct the entered Condition, the "*restoration Action*," and it starts upon discovery of a failure to meet the LCO noted in the associated Condition. (In the above example, the restoration Action is not stated because it is not anticipated that a jet pump can be restored to OPERABLE status without first shutting down the facility.) When restoration is not possible, an "*alternative Action*" is typically to place the facility outside the Applicability of the LCO (as in this example, MODE 3), i.e., a "*shutdown Action*."

In this example, if one jet pump is determined to be inoperable, Condition A is entered and the 12-hour Completion Time clock for shutdown Required Action A.1 starts. If a second jet pump is subsequently determined to be inoperable, then Condition A is still applicable; no new clock based on the second jet pump is kept. If it was possible, without shutting down, to restore the first jet pump to OPERABLE status, and it was restored, then the time left to complete Action A.1 would be whatever time remains on the Completion Time clock started when Condition A was first entered. The reason for the use of Condition-based clocks is to limit how long facility operation can continue at risk with an LCO not met.

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EXAMPLES (continued)

EXAMPLE 1.3.2-3b

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

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

--------------------NOTES------------------
1. Normally locked or sealed closed isolation valves [except for 42-inch purge valves] may be opened intermittently under administrative controls.

2. Each penetration flow path is treated as an independent entity for this LCO, with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	----------NOTE--------- Not applicable to those penetrations that have only 1 isolation valve. ----------------------	
A. ------NOTE------ Not applicable to those penetrations with only 1 containment isolation valve and a closed system inside containment. --------------- One or more containment isolation valves inoperable.	A.1 Verify at least 1 isolation valve is OPERABLE in each affected open penetration. AND	1 hour

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EXAMPLES (continued)

EXAMPLE 1.3.2-3b (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.1	Restore the valve(s) to OPERABLE status.	4 hours

The other Required Actions stated for Condition A of this LCO are omitted for brevity.

This example illustrates the use of function-based Completion Time clocks. The number of LCOs with ACTIONS that use function-based clocks are relatively few. When a function-based clock is used, a Note is always provided in the LCO or the ACTIONS that defines when to use separate Completion Time clocks. Function-based clocks are used when the affected systems or subsystems are sufficiently independent such that they could have been placed in separate LCOs, but were not for the sake of brevity.

In this example, Note 2 says that each penetration flow path with one or more isolation valves inoperable has its own Completion Time. If one valve in one flow path is determined to be inoperable, then the Completion Time clocks start immediately for the Required Actions for that flow path and Condition A is entered. If a second valve in the same flow path is later determined to be inoperable, then, because it is in the same flow path, the time allowed to complete the Required Actions for that valve are whatever times are left on the Completion Time clocks started for that flow path.

If a second valve in a separate flow path is determined to be inoperable, however, either at the same time or at a later time, then Condition A would be entered separately for that flow path with separate Completion Time clocks for the Required Actions for the second valve that start when the valve is discovered to be inoperable.

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EXAMPLES (continued)

EXAMPLE 1.3.2-3b (continued)

For multiple-situation Conditions, there is frequently provided, along with a restoration Action (such as A.2.1), a *"companion remedial Action"* (such as A.1) that must be accomplished each time the Condition becomes applicable for an additional component or function. Such companion remedial Actions can occur regardless of whether the clocks are Condition-based or function-based. Thus, in the example, Action A.1 for the second valve in the same flow path would still be allowed up to 1 hour to be completed.

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EXAMPLES (continued)

EXAMPLE 1.3.2-4

LCO 3.6.2 [Two] containment air lock(s) shall be OPERABLE.

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

---------------------------NOTE---------------------------
All containment air locks are treated as an entity for this LCO, with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------NOTE------ Entry and exit of containment is permissible under the control of a dedicated individual if 1 or more air locks are inoperable. --------------- Containment air lock interlock mechanism inoperable in 1 or more containment air locks.	B.1	Verify an OPERABLE door closed in each affected air lock.	1 hour
	AND		
	B.2.1	Restore air lock interlock mechanism to OPERABLE status.	24 hours
	OR		
	B.2.2.1	Lock the OPERABLE door closed in each affected air lock. AND	24 hours

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EXAMPLES (continued)

EXAMPLE 1.3.2-4 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2.2.2	Verify an OPERABLE door is locked closed in each affected air lock.	Once per 31 days
D. Required Actions and associated Completion Times not met.	D.1	Be in MODE 3.	6 hours {VS-GE: 12 hours}
	AND		
	D.2	Be in MODE 5. {VS-GE: MODE 4}	36 hours

Note: Conditions A and C of this example LCO Actions have been omitted for brevity.

In this example a Note has been added under the Applicability to indicate that all containment air locks are treated as a single entity for this LCO with a single (Condition-based) Completion Time. This means that all of the specified containment air lock LCO ACTIONS Conditions (A, B, C) are within the same functional entity, and that all of the Conditions must be corrected within a Completion Time that is limited to the longest Completion Time specified for a restoration Required Action (e.g., B.2.1) of the three Conditions that are concurrently entered. (See Completion Time convention rule 1.3.3.) This limitation is discussed further in this example and in Example 1.3.3-2. For this example, it is assumed that only Condition B is affected by an inoperable air lock interlock mechanism.

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EXAMPLES (continued)

EXAMPLE 1.3.2-4 (continued)

Condition B is a multiple-situation Condition that uses Condition-based Completion Time clocks for its associated Required Actions. (Notice that no Note is provided that indicates use of function-based clocks.) The Logical Connector "AND" after Action B.1 means that B.1 is a *"companion remedial Action"* to restoration Action B.2.1. However, it is also, a companion remedial Action to *"alternative Actions,"* B.2.2.1 and B.2.2.2. This means Action B.1 must always be accomplished regardless of which of the other alternative Actions are chosen.

If the interlock mechanism in just one air lock is determined to be inoperable, the Completion Time clocks for the associated Required Actions start and Condition B is entered. Assuming Action B.1 is completed on time, then the ACTIONS provide an alternative to Action B.2.1 for restoring the interlock mechanism to OPERABLE status; these alternative Actions, B.2.2.1 and B.2.2.2, are known as *"unlimited remedial Actions."* Unlimited means that as long as the Actions are met, then operation of the facility in the associated Condition can continue indefinitely. This is because compliance with such Actions provides a level of safety equivalent to that provided by meeting the LCO.

Suppose that Action B.2.2.1 was completed before its 24-hour Completion Time expired (assuming that restoration Action B.2.1 could not be accomplished). This would allow facility operation to continue in Condition B. *"Periodic remedial Action,"* B.2.2.2, must be performed every 31 to 38 $\frac{3}{4}$ days (the 25% extension of SR 3.0.2 applies) in order to permit facility operation to continue in Condition B.

Once an unlimited remedial Action is met, with respect to an inoperable component or system, the Completion Time clock(s) associated with all of the Required Actions specified for the entered Condition are reset just as they would be if the restoration Action had been accomplished. Thus, if a separate component (addressed by that Condition) was later found to be inoperable, the time allowed to perform each Required Action for that component would be the entire Completion Time specified. This is the case whether Condition-based or function-based clocks are used.

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EXAMPLES (continued)

EXAMPLE 1.3.2-4 (continued)

However, when Condition-based clocks are used, as in this example (and also when function-based clocks are used and the affected components are within the same functional entity, such as two valves in the same penetration flow path as discussed in Example 1.3.2-3b), and the second component is found inoperable prior to completing either the restoration Action (B.2.1) or the unlimited remedial Actions (B.2.2.1 and B.2.2.2) for the first component, then the time allowed for completing these Actions for the second component is the time remaining for completing the same Actions for the first component.

To illustrate this point, consider this sequence of events. At time zero, Condition B is entered for one inoperable interlock mechanism. Later, at time 8 hours, a second interlock mechanism is determined to be inoperable. The time now allowed for completing either Action B.2.1 or Action B.2.2.1 for each interlock mechanism is 24 minus 8, or 16 hours. If one of these Actions is completed for the first mechanism, for example, at time 20 hours, then just 24 minus 20, or 4 hours remain to complete one of these Actions for the second mechanism.

Thus, by using the Condition-based Completion Time clock convention, the time that the facility can operate without either correcting a Condition or completing an associated unlimited remedial Action (if specified) is limited.

The Note under the Applicability conveys that the Completion Time for restoring compliance with this LCO starts upon discovery of the first inoperable component associated with Condition A, B, or C. Any subsequent component associated with either the same Condition or any of the other two Conditions found inoperable prior to completing the restoration Actions (e.g., B.2.1) or unlimited remedial Actions (e.g., B.2.2.1 and B.2.2.2) for the first component, then the time allowed for completing such Actions for the second component is the time remaining for completing these Actions for the first component. The same explanations as discussed in the above scenario for Condition B apply when more than one LCO Condition is involved.

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EXAMPLES (continued)

EXAMPLE 1.3.2-4 (continued)

Whenever any Required Action is not met within its specified Completion Time (nor any alternative Action that may be stated), entry into a *"default Condition"* is usually required. A default Condition stated in an LCO's ACTIONS is always worded in a manner equivalent to the following: "Required Actions and associated Completion Times not met." In this example, Condition D is a default Condition. The Completion Time clock for a default Condition is kept, without exception, on a Condition-basis.

If the ACTIONS do not state a default Condition and the facility is in an applicable MODE for LCO 3.0.3, then, for such LCOs, entry into LCO 3.0.3 would usually be required; thus, LCO 3.0.3 acts as a default condition in such cases.

In this example, Condition D has two Required Actions specified. The Completion Time for each Action starts when Condition D is first entered. If Action D.1 was accomplished in, for example, 4 hours, then there would still be 36 minus 4, or 32 hours remaining to accomplish Action D.2. The time allowed to complete D.2 is not diminished by completing D.1 in less than the time specified.

The Applicability of the LCO from which this example was taken is MODES 1, 2, 3, and 4. Thus, it can be seen that the Actions for Condition D are to place the facility in a MODE or other specified condition that is outside the Applicability of the LCO; this is the case for almost all default Conditions.

It is possible to exit default Conditions without restoring the LCO. However, because of the variety of situations that can occur, this provision is discussed separately in the examples for Completion Time convention rule 1.3.4.

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EXAMPLES (continued)

EXAMPLE 1.3.2-5

APPLICABILITY: When irradiated fuel assemblies are in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	----------NOTE---------- LCOs 3.0.3 and 3.0.4 are not applicable. ----------------------	
A. Fuel storage pool water level not within limit.	A.1 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2 Initiate action to restore fuel storage pool water level.	Immediately

In this example, a Note states that LCOs 3.0.3 and 3.0.4 are not applicable. This is because the fuel storage pool's function is not affected by the operational MODE of the facility. Also, notice that no default Condition is stated. This is because the logical Actions to take upon failing to accomplish A.1 and A.2 are to accomplish A.1 and A.2; there are no alternatives.

Action A.2 is an example of a type of Action without a definite Completion Time. The Completion Time specified is related only to when the Action must be initiated. In this

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EXAMPLES (continued)

EXAMPLE 1.3.2-5 (continued)

example, "Immediately" is specified, but longer time periods such as 15 minutes or 24 hours do occur for Actions of this type.

When "Immediately" is specified as a Completion Time (as for A.1), the associated Required Action should be pursued continuously without delay. In this example, action must continue until the water level is restored to within limits.

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EXAMPLES (continued)

EXAMPLE 1.3.3-1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One subsystem inoperable.	A.1	Restore subsystem to OPERABLE status.	7 days
B. Two subsystems inoperable.	B.1	Restore 1 subsystem to OPERABLE status.	8 hours

This example LCO ACTIONS is a simplified generalization for purposes of discussing Completion Time convention rule 1.3.3.

If one subsystem is found inoperable, the 7-day Completion Time clock for restoration Action A.1 for that subsystem starts immediately and Condition A is entered. Later, at time 4 days, for instance, the second subsystem is determined to be inoperable. Condition A applies to the second subsystem, but it has already been entered. Now, because Condition-based clocks are used, the time allowed to restore the second subsystem is, at most, the same as the time remaining to restore the first subsystem (i.e., 7 days minus 4 days, or 3 days). Because two subsystems are now inoperable, however, Condition B must also be entered. Action B.1 requires that one of the subsystems be made OPERABLE in a much shorter time, 8 hours. Suppose the first subsystem is restored to OPERABLE status 6 hours later, then Condition B is exited and its Completion Time clock is reset. (See Completion Time convention rule 1.3.4.) The time remaining is now 7 days minus 4 days and 6 hours, or 2 days and 18 hours.

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EXAMPLES
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EXAMPLE 1.3.3-1 (continued)

Suppose that the first subsystem is again determined to be inoperable, for example, at time 6 days and 20 hours. Condition A again applies to the first subsystem, but was never exited since it was initially entered. Therefore, only 4 hours remain to restore both subsystems to OPERABLE status. Condition B also applies again and is entered, but 4 hours, not 8 hours, are left in which to complete Action B.1. This scenario illustrates how using Condition-based Completion Time clocks limits how long facility operation can continue to be at risk with an LCO not met.

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EXAMPLES (continued)

EXAMPLE 1.3.3-2

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One train inoperable.	A.1	Restore train to OPERABLE status.	72 hours
B. Two trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1	Restore 1 train to OPERABLE status.	Immediately
	OR		
	B.2.1	Be in MODE 3.	6 hours
	AND		
	B.2.2	Be in MODE 4.	12 hours
	AND		
	B.2.3	Be in MODE 5, provided that 1 train is OPERABLE.	36 hours

This example LCO ACTIONS is a simplified generalization for purposes of discussing Completion Time convention rule 1.3.3.

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EXAMPLES (continued)

EXAMPLE 1.3.3-2 (continued)

If one train is found inoperable, the 72-hour Completion Time clock for restoration Action A.1 starts immediately, and Condition A is entered for that train. Later, at time 24 hours, for instance, the second train is determined to be inoperable. Condition A applies to the second train, but it has already been entered. Now, because Condition-based clocks are used, the time allowed to restore the second train is, at most, the same as the time remaining to restore the first train (i.e., 72 hours minus 24 hours, or 48 hours). Because both trains are now inoperable, however, Condition B must also be entered. If Required Action B.1 to restore one train to OPERABLE status cannot be immediately accomplished, then the Completion Time clocks for Required Actions B.2.1, B.2.2, and B.2.3 must continue to run.

If the first train is restored to OPERABLE status 4 hours later (and prior to changing MODES to comply with Action B.2.1) then Condition B is exited and its Completion Time clocks are reset. (See Completion Time convention rule 1.3.4.) The time remaining to restore the second train to OPERABLE status is 72 hours minus 28 hours, or 44 hours.

If the first train is again determined to be inoperable, for example, at time 70 hours, Condition A again applies to the first train. However, because Condition A was never exited since it was initially entered, only 2 hours remain to restore both trains to OPERABLE status. Since both trains are again inoperable, Condition B is reentered immediately and the Completion Time clocks for Actions B.1, B.2.1, B.2.2, and B.2.3 start again.

Even if one train was again made OPERABLE, at time 72 hours, facility shutdown would still be required by Action B.2.1, B.2.2, or B.2.3. This scenario (apart from the shutdown Actions of Condition B) illustrates how using Condition-based Completion Time clocks limit how long facility operation can continue to be at risk with an LCO not met.

If at time 106 hours (70 plus 36 hours) both trains are still inoperable, then entry into MODE 5 (outside the Applicability of the LCO) would not be possible as noted by Action B.2.3.

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EXAMPLES
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EXAMPLE 1.3.3-3 (VS - W, B&W, and CE)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One containment spray train inoperable.	A.1	Restore containment spray train to OPERABLE status.	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.	84 hours
C. One containment cooling train inoperable.	C.1	Restore containment cooling train to OPERABLE status.	7 days
D. Two containment cooling trains inoperable.	D.1	Restore 1 containment cooling train to OPERABLE status.	72 hours

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EXAMPLES (continued)

EXAMPLE 1.3.3-3 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Two containment spray trains inoperable. OR Any combination of 3 or more trains inoperable.	E.1	Enter LCO 3.0.3.	Immediately
F. Required Actions and associated Completion Times of Condition C or D not met.	F.1	Be in MODE 3.	6 hours
	AND		
	F.2	Be in MODE 5.	36 hours

If one spray train is found inoperable, then the 72-hour Completion Time clock for restoration Action A.1 starts immediately, and Condition A is entered. Later, if at time 24 hours, one cooling train is also determined to be inoperable; Condition C is entered and the 7-day Completion Time clock for restoration Action C.1 starts immediately.

No single designated Condition (A through F) actually states one spray and one cooling train inoperable. Conditions A and C taken together, however, describe exactly that condition of the facility. Therefore, the LCO 3.0.3 entry condition, "because an ACTION is not provided," is not applicable.

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EXAMPLES (continued)

EXAMPLE 1.3.3-3 (continued)

Because entry into Condition A does not imply entry into Condition C (or vice versa), it is possible to enter the LCO as above and then, by alternative exit and entry into Conditions A and C, to continue facility operation indefinitely without restoring the LCO. In this scenario, use of Condition based clocks alone does not limit such operation. However, in this example, the ACTIONS do state a "*combination Condition*" that encompasses Conditions A and C; this is Condition E. Therefore, by Completion Time convention rule 1.3.3, if Conditions A and C are entered concurrently, compliance with the LCO must be restored within the limit of the longest Completion Time specified for these Conditions (i.e., the 7-day Completion Time of Action C.1).

To illustrate this point, continue the scenario started above. Suppose, at time 48 hours, Condition A is corrected and its Completion Time clock is reset. There are now 7 days minus 48 hours, or 5 days, remaining to complete Action C.1. (Note that the time limit to restore the LCO is based upon when the LCO's ACTIONS were first entered; 7 days minus 24 hours, or 6 days would not be correct.) Suppose that later, at time 6 days, Condition A is reentered and its Completion Time clock starts again. Because of the restriction discussed above, the Completion Time is only 7 days minus 6 days, or 24 hours, and not the stated 72 hours. If 12 hours later (at time 6 days and 12 hours), Condition C is corrected and upon reaching time 7 days, if Condition A has still not been corrected, then entry into default Condition B would be required.

Alternatively, if Condition C had also not been corrected, then, at time 7 days, entry into default Condition F would be required too. Notice that Action F.2 is more conservative than Action B.2; thus, F.2 should be followed as specified by Completion Time convention rule 1.3.1.

If no combination Condition, such as Condition E, that encompassed Conditions A and C had been provided in the ACTIONS, then the restriction of Completion Time convention rule 1.3.3 on facility operation with the LCO not met would not apply. The number of LCOs illustrated by this example are few.

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EXAMPLES (continued)

EXAMPLE 1.3.4-1 (VS - W, B&W, and CE)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One containment spray train inoperable.	A.1	Restore containment spray train to OPERABLE status.	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.	84 hours
C. One containment cooling train inoperable.	C.1	Restore containment cooling train to OPERABLE status.	7 days
D. Two containment cooling trains inoperable.	D.1	Restore 1 containment cooling train to OPERABLE status.	72 hours

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EXAMPLES (continued)

EXAMPLE 1.3.4-1 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Two containment spray trains inoperable. OR Any combination of 3 or more trains inoperable.	E.1	Enter LCO 3.0.3.	Immediately
F. Required Actions and associated Completion Times of Condition C or D not met.	F.1 AND F.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

The ACTIONS used in Example 1.3.3-3 are used again for this example because, with it, several aspects of Completion Time convention rule 1.3.4 can be illustrated. (It is considered very unlikely that a scenario such as the following would ever occur, but it is instructive.)

The Required Actions in this Example are of two kinds, restoration Actions and shutdown Actions. If Condition A was entered for one spray train being inoperable, and restoration Action A.1 was not accomplished within the 72-hour Completion Time, then default Condition B would be entered and the Completion Time clocks for shutdown Actions B.1 and B.2 would start. Suppose that Condition C had also been entered for one cooling train being inoperable at time 24 hours after Condition A had been initially entered.

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EXAMPLES (continued)

EXAMPLE 1.3.4-1 (continued)

(Recall from Example 1.3.3-3 that this situation had imposed a 7-day limit on operation with the LCO not met.) Next suppose that Condition A is corrected at time 74 hours, which allows the Completion Time clock for Action A.1 (which had expired at time 72 hours) to be reset. Since Condition B applies only upon failure to meet the ACTIONS of Condition A, it no longer applies and the Completion Time clocks for Actions B.1 and B.2 can be reset. There now remain 7 days minus 74 hours, or 94 hours, to accomplish restoration Action C.1.

Next, suppose that a second cooling train is found inoperable at time 80 hours (i.e., there are now 7 days minus 80 hours, or 88 hours, to accomplish Action C.1). So Condition D is entered and the 72-hour Completion Time clock for restoration Action D.1 starts. After 72 hours have elapsed, if both cooling trains are still inoperable, then at time 152 hours (80 plus 72 hours) default Condition F is entered. The Completion Time clocks for shutdown Actions F.1 and F.2 start. If at time 154 hours, (prior to changing MODES to comply with Action F.1) the first cooling train is restored to OPERABLE status (i.e., Condition D is no longer applicable), then Condition F can be exited and the Completion Times for Actions F.1 and F.2 can be reset.

Next suppose that the other spray train is found inoperable at time 160 hours. There are now just 7 days minus 160 hours, or 8 hours, to accomplish both Action C.1 and Action A.1. Assuming that neither Action is accomplished by time 168 hours (7 days), then both default Conditions B and F are entered, and the Completion Time clocks (previously reset) for shutdown Actions B.1, B.2, F.1, and F.2 start at the same time. Because Action F.2 is more conservative (36 hours to be in MODE 5) than Action B.2 (84 hours to be in MODE 5), Action F.2 should be followed as required by Completion Time convention rule 1.3.1.

If Action C.1 is accomplished prior to the expiration of the 36-hour Completion Time for Action F.2 (and prior to entry into MODE 5), then whatever time was left of the 84-hour Completion Time for Action B.2 would be allowed for reaching MODE 5. Also, the Completion Time clocks for Actions F.1, F.2, and C.1 are reset. If prior to the expiration of the 84-hour Completion Time for Action B.2, restoration

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EXAMPLES (continued)

EXAMPLE 1.3.4-1 (continued)

Action A.1 is accomplished, then the LCO is restored and the facility may be returned to MODE 1. Since Condition B no longer applies, there is no requirement to complete Action B.1. The Completion Time clocks for Actions A.1, B.1, and B.2 are reset.

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EXAMPLES (continued)

EXAMPLE 1.3.4-2

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One train inoperable.	A.1	-----NOTE---- LCO 3.0.4 is not applicable. ------------- Restore 1 train to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours

This example LCO ACTIONS is a simplified generalization for the purpose of discussing Completion Time convention rule 1.3.4 where there is an exception to LCO 3.0.4.

In this example, entry into MODE 1 or 2 is allowed when one train is inoperable because of the Note that states LCO 3.0.4 is not applicable. However, if this is done, then the 30-day Completion Time clock for restoration Action A.1 would begin immediately upon entering MODE 2 from MODE 3.

Failure to restore the train to OPERABLE status within 30 days requires entry into Condition B. Upon entering MODE 3 in compliance with Action B.1, the Completion Time clocks for Actions A.1 and B.1 reset. Entry into

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EXAMPLES (continued)

EXAMPLE 1.3.4-2 (continued)

MODE 1 or 2 would then be allowed again. Upon doing so, another 30 days of operation would be permitted, etc. This scenario, though possible, is not considered probable. For it to continue for more than one repetition is considered unlikely because intentionally operating a facility in this manner would be impractical. The consequences of operating more than 30 days with one train inoperable are considered to provide sufficient incentive to restore the train to OPERABLE status within a reasonable period of time.

Should both trains be determined to be inoperable, entry into LCO 3.0.3 would be required since no Condition or combination of Conditions corresponds to this situation. The exception to LCO 3.0.4 only applies when one train is inoperable, thus entry into MODE 1 or 2 would not be permitted in this Condition. LCO 3.0.3 would only require going to MODE 3 (outside the Applicability of the LCO). If already in MODE 3, then no shutdown Action to higher numbered MODES would be required by this LCO's ACTIONS.

If both trains are simultaneously found inoperable in MODE 1, the 30-day Completion Time clock for Action A.1 starts and Condition A is entered. LCO 3.0.3 is also entered; it requires being in MODE 3 within 7 hours. If, prior to reaching MODE 3, one train is restored to OPERABLE status, then LCO 3.0.3 is exited and its 7-hour Completion Time clock resets. Reentry into MODE 1 is allowed because of the exception to LCO 3.0.4 and the time remaining of the 30-day Completion Time clock of Action A.1. If MODE 3 had been entered without restoring any trains to OPERABLE status, then reentry into MODE 1 or 2 would not be allowed. The Completion Time for Action A.1 would be reset, however.

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EXAMPLES (continued)

EXAMPLE 1.3.4-3

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------NOTE------ Entry and exit of containment is permissible under the control of a dedicated individual if 1 or more air locks are inoperable. ------------------ Containment air lock interlock mechanism inoperable in 1 or more containment air locks.	B.1	Verify an OPERABLE door closed in each affected air lock.	1 hour
	AND		
	B.2.1	Restore air lock interlock mechanism to OPERABLE status.	24 hours
	OR		
	B.2.2.1	Lock the OPERABLE door closed in each affected air lock.	24 hours
	AND		
	B.2.2.2	Verify an OPERABLE door is locked closed in each affected air lock.	Once per 31 days

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EXAMPLES (continued)

EXAMPLE 1.3.4-3 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Actions and associated Completion Times not met.	D.1	Be in MODE 3.	6 hours {VS-GE: 12 hours}
	AND		
	D.2	Be in MODE 5. {VS-GE: MODE 4}	36 hours

The ACTIONS used in example 1.3.2-4 are used again for this Example because "default Conditions" were first discussed in that example.

Entry into default Condition D would be required upon occurrence of one or more of the following events:

a. Companion remedial Action B.1 not completed within 1 hour after an interlock mechanism was determined to be inoperable;

b. Failure to complete either restoration Action B.2.1 or unlimited remedial Action B.2.2.1 within 24 hours after entering Condition B;

c. Failure to perform periodic remedial Action B.2.2.2 within the specified interval, plus 25% of the interval; or

d. Failure to meet the Required Actions of any of the other designated Conditions (that have been omitted for brevity in this example) that may have been entered in the LCO's ACTIONS.

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EXAMPLES (continued)

EXAMPLE 1.3.4-3 (continued)

Since default Conditions always use Condition-based Completion Time clocks, determining when Condition D can be exited is the same regardless of how many entry events happen concurrently; Condition D can be exited only when all of the entry conditions that have occurred concurrently have been corrected. The following scenario illustrates this point.

Condition B is entered for one interlock mechanism being found inoperable. If Action B.1 is not accomplished within 1 hour, then Condition D is entered. If at time 2 hours, Action B.1 is performed, then Condition D is exited and the Completion Time clocks for shutdown Actions D.1 and D.2 and remedial Action B.1 are reset.

Next, upon failure to complete either Action B.2.1 or Action B.2.2.1, at time 24 hours, Condition D is entered again. Then suppose that, at time 26 hours, unlimited remedial Action B.2.2.1 is completed. This causes all the Completion Time clocks for Actions B.2.1, B.2.2.1, and B.2.2.2 to reset, so that if another interlock mechanism is found inoperable, then the entire Completion Time specified for each Action is available.

Operation of the facility can continue indefinitely as long as periodic remedial Action B.2.2.2 is met and no other entry conditions for Condition D occur.

If a Required Action for Condition A (not shown) of this LCO's ACTIONS was not met concurrently with Actions B.2.1 and B.2.2.1, then the scenario above would still be correct, except that Condition D would still apply and its shutdown Action Completion Time clocks would continue to run. While shutting down to comply with Actions D.1 and D.2, consideration should be given for continuing performance of any applicable periodic remedial Actions, if any, until the facility is outside the Applicability of the LCO.

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TERMS USED	The following terms were introduced in Section 1.3 to facilitate the description of the Completion Time convention. These terms and their meanings, as used therein, are provided here for reference. Unlike the terms defined in Section 1.1, Definitions, these terms do not appear in capitalized type and are not generally used throughout these TS and Bases; they primarily apply to Section 1.3. Where these terms are used in other sections of the TS or the Bases, the meanings stated here can be assumed to apply, unless otherwise stated in the specific application.
Action	This is short for Required Action.
allowed outage time (AOT)	This refers to a Completion Time associated with a restoration Action. This term is also commonly used when referring to the time allowed by TS for intentionally entering an LCO for maintenance or testing.
alternative Action	This refers to any Required Action that is stated as an option among other stated Actions for the same Condition by use of the logical connector "<u>OR</u>."
combination Condition	This refers to an individual Condition that corresponds to two or more other individual Conditions being applicable at the same time. A combination Condition is provided when the safety significance of the combination warrants more restrictive Required Actions and Completion Times than specified for the individual Conditions separately.
companion Action	This refers to any Required Action that is stated in addition to one or more other stated Actions for the same Condition by use of the logical connector "<u>AND</u>."
Completion Time clock	This is a convenient way of referring to the act of keeping track of how much of a Completion Time interval has elapsed.
condition-based Completion Time clock	This refers to the normal way in which Completion Time clocks are tracked. The Completion Time specified for a Required Action is referenced to the time of discovery of a failure to meet the LCO that corresponds to a Condition stated in the LCO's ACTIONS. The Completion Time clock for performing the specified restoration Action, unlimited remedial Action, or shutdown Action, does not reset until

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TERMS USED (continued)	one of such Actions are completed and the Condition no longer exists or applies. (See Completion Time convention rule 1.3.4.)
default Condition	This refers to an individual Condition that is entered only upon failure to perform a Required Action within the specified Completion Time for any of the other individual Conditions specified. The Required Action for a default Condition is almost always to place the facility in a state outside the Applicability of the LCO. When no default Condition is provided in the ACTIONS, entry into LCO 3.0.3 is usually required; thus, LCO 3.0.3 serves as a general default Condition.
function-based Completion Time clock	This refers to a way of tracking a Completion Time clock on a basis other than a Condition basis. In practice, only ACTIONS Conditions that state the words "one or more," i.e., multiple-situation Conditions, use function-based clocks. Even so the majority of multiple-situation Conditions use Condition-based clocks. When function-based clocks are used, a Note is provided in the LCO or the LCO's ACTIONS, that specifies the basis for tracking the Completion Time clocks; i.e., when a separate clock should be kept.
individual Condition	This refers to a separately designated Condition stated in the ACTIONS.
multiple-situation Condition	This refers to an individual Condition that states the words, "one or more."
periodic Completion Time	This refers to a Completion Time that specifies the time intervals between performances of a periodic remedial Action. The 25% extension of SR 3.0.2 is permitted for periodic Completion Times.
periodic remedial Action	This refers to any remedial Action specified for periodic performance by a periodic Completion Time.
remedial Action	This refers to any Required Action except the restoration Action and the shutdown Action.
restoration Action	This refers to a Required Action to correct the entered Condition. Examples are: to restore equipment OPERABILITY, to place required equipment in operation, or to restore a

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TERMS USED (continued)	va[illegible] to within specified limits. If the restoration Action is not stated in the ACTIONS, it is understood to be an alternative Action.
shutdown Action	This refers to a Required Action to place the facility in a MODE or other operational condition in which the LCO is not applicable. Default Conditions usually specify a shutdown Action.
unlimited remedial Action	This refers to a remedial Action that, if met, permits facility operation to continue for an unlimited period of time without correcting the associated Condition. Such an Action is usually an alternative Action.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSF

The purpose of this section is to define the proper use and application of Frequency Requirements. Each SR has a specified Frequency in which the SR 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 each SR.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified.

EXAMPLE 1.4-1

SURVEILLANCE	FREQUENCY
Perform a CHANNEL CHECK.	12 hours

This example contains the type of Frequency most often encountered in the Technical Specifications (TS)(referred to as a regular Frequency). It 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 the Surveillance interval continues at all times, even when the SR is not required (such as when the equipment is inoperable, a variable is outside specified limits, or the facility is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while in a MODE or other specified condition in the Applicability of the LCO for which the performance of the surveillance is required, then SR 3.0.3 becomes applicable. If the interval as

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EXAMPLES (continued)

EXAMPLE 1.4-1 (continued)

specified by SR 3.0.2 is exceeded while not in a MODE or other specified condition in the Applicability of the LCO for which performance of the Surveillance is required, the Surveillance must be performed prior to entry into the MODE or other specified condition. Failure to do so would result in a violation of SR 3.0.4 and LCO 3.0.4, unless an exception to SR 3.0.4 is specified.

Sometimes special conditions dictate when a Surveillance is to be met. They may be stated as clarifying Notes or as part of the SR itself. The remaining examples discuss these special conditions.

EXAMPLE 1.4-2

SURVEILLANCE	FREQUENCY
-------------------NOTE------------------ SR 3.0.4 is not applicable. --	
Verify each shutdown bank within limit.	Once within 15 minutes prior to initial control bank withdrawal during an approach to criticality AND 12 hours

This example has two Frequency requirements that include a conditional event Frequency (within 15 minutes prior to . . .) followed by a regular Frequency as described in Example 1.4-1 (12 hours). The logical connector "AND" requires both Frequencies to be met. If no other guidance

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EXAMPLES (continued)

EXAMPLE 1.4-2 (continued)

is given, "prior to" means "within the specified time period prior to," and requires the Surveillance to be performed only once during this period. Sufficient guidance is provided with this conditional event Frequency to determine the time period within which the Surveillance must be performed.

Since the conditional event Frequency in this example is performed only once ("prior to" the event), the Frequency 25% extension allowance of SR 3.0.2 does not apply to the 15 minutes. Should the conditional event (initial control bank withdrawal . . .) not occur prior to the Frequency (15 minutes) elapsing, the Surveillance must be performed again such that the Surveillance is performed within 15 minutes of the conditional event. The regular Frequency of 12 hours applies thereafter as described in Example 1.4-1.

This Surveillance is modified by a Note that indicates that SR 3.0.4 is not applicable. This exception is needed to allow entry into the Applicability of the LCO associated with this SR. (The Applicability is "MODE 1, MODE 2, and within 15 minutes prior to initial control bank withdrawal during an approach to criticality.") Upon the LCO becoming applicable, (in this case it would become applicable when the licensee declares it to be so) if the Surveillance is not performed within the specified interval of 15 minutes, then control bank withdrawal would not be allowed.

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EXAMPLES (continued)

EXAMPLE 1.4-3 (optional)

SURVEILLANCE	FREQUENCY
-------------------NOTE------------------ SR 3.0.4 is not applicable. ---	
Demonstrate, with reactor pressure ≤ [1020] psig, that the reactor core isolation cooling (RCIC) pump can develop a flow rate ≥ [400] gpm against a system head corresponding to a reactor pressure ≥ [165] psig.	92 days OR Once only 12 hours after reactor steam dome pressure is ≥ [920] psig

Note: This example SR was taken from the BWR/4 Standard TS to illustrate the use of the logical connector OR in a Frequency specification. No such examples were found in the WOG Standard TS.

This example has two alternative Frequencies in which to satisfactorily perform the Surveillance. The first Frequency (92 days) is similar to that shown in Example 1.4-1. The alternative Frequency is one for which the measurement of the 12-hour interval does not continue at all times. The measurement of the 12-hour interval begins only upon reaching or exceeding [920] psig.

If reactor steam dome pressure is less than [920] psig at a time when the 92-day (plus 25%) interval expires, the second Frequency can be selected. Because the Surveillance cannot be performed unless pressure is at least [920] psig, it is not to be considered that a failure to perform the surveillance within the specified Frequency has occurred, even though the facility is in the Applicability of the LCO.

The Surveillance is modified by a Note that indicates that SR 3.0.4 is not applicable. This means that the facility can enter into a MODE or other specified condition in

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EXAMPLES
(continued)

EXAMPLE 1.4-3 (continued)

the Applicability of the LCO without this Surveillance being performed. In this case, entering into a lower-numbered MODE will provide the pressure increase needed for the performance of the Surveillance. However, upon reaching [920] psig, 12 hours would be allowed to complete the Surveillance. (The 25% extension does not apply because this is a one-time performance Frequency.) If not performed within this interval, it would then become a failure to perform a Surveillance within the specified Frequency. Only then would MODE changes be restricted in accordance with SR 3.0.4 and the provisions of SR 3.0.3 apply. Once the Surveillance is performed, the 92-day Frequency applies. If the 92-day interval (plus 25%) were to expire when pressure is ≥ [920] psig, then that would be a failure to perform the Surveillance within the specified Frequency. In summary, the second Frequency is meant to be chosen only if the first Frequency expires at a time when pressure is less than [920] psig, and not every time [920] psig is reached. The condition of the Frequency (e.g., when reactor steam dome pressure is ≥ [920] psig) may be expressed as a Note or as prose as in this example.

EXAMPLE 1.4-4

SURVEILLANCE	FREQUENCY
------------------NOTES------------------ 1. The CHANNEL CALIBRATION shall consist only of a comparison of a Nuclear Instrumentation System (NIS) channel with results of the calorimetric. 2. Adjust NIS channel if absolute difference is > 2%. 3. SR 3.0.4 is not applicable. --	-----NOTE---- Only required when THERMAL POWER is > 15% of RATED THERMAL POWER (RTP) -------------
Perform CHANNEL CALIBRATION.	24 hours

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EXAMPLES (continued)

EXAMPLE 1.4-4 (continued)

This example requires that the Surveillance be met only above 15% RTP. The Note "Only required . . ." means this Surveillance may be performed in any MODE or other specified condition where unit status would allow successful completion.

The interval measurement for the Frequency of this Surveillance continues at all times, as described in Example 1.4-1. If the Surveillance was not performed within the 24-hour (plus 25%) interval, but operation was below 15% upon expiration of the interval, it would not constitute a failure to meet the LCO. The Surveillance is not required below 15% RTP, even though the LCO, per its Applicability, may be required to be met.

The Surveillance is modified by another Note that indicates that SR 3.0.4 is not applicable. This means that MODE changes are not restricted by the nonperformance of this Surveillance. However, upon reaching 15% RTP, if the Surveillance is not performed within 12 hours as required by the provisions of SR 3.0.4, only then would MODE changes be restricted in accordance with SR 3.0.4 and the provisions of SR 3.0.3 apply.

1.0 USE AND APPLICATION

1.5 OPERABILITY Definition Implementation Guidance

PURPOSE

This section sets forth the guidance used in the development of the new Standard Technical Specifications (STS) for implementing the definition of OPERABLE-OPERABILITY. The following guidance establishes an acceptable way to follow the rules for implementing the general principles embodied by the definition of OPERABILITY contained in Section 5.8.

The guidance will provide the necessary direction to lead and follow on facilities converting to the new STS to develop new Technical Specifications (TS) unique to their facilities and to properly integrate them into the new STS in a manner that satisfies the requirements set forth in the definition of OPERABILITY.

BACKGROUND

The definition of OPERABLE-OPERABILITY embodies a principle that a system, subsystem, train, component, or device (hereafter referred to as the system) can perform its function(s) only if all necessary support systems are capable of performing their related support functions. This definition extends the requirements of an LCO for those systems that directly perform a specified function (supported systems) to those that perform a required support function (support systems).

Establishing and maintaining the OPERABILITY of systems is an ongoing and continuous decision-making process. This process includes routine facility walkdowns or tours and following procedures governing the day-to-day operation of the facility. It also includes the performance of procedures that implement SRs, inservice testing and inspection programs, and other programs specified in Section 5.7.4, and procedures that implement preventive maintenance requirements. Many such procedures contain acceptance criteria for establishing, verifying, or demonstrating OPERABILITY.

In addition to the above proactive process for establishing and maintaining OPERABILITY, there is a reactive process

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BACKGROUND (continued)

which takes place as part of the corrective action for a nonconforming or degraded condition on a system. Upon identification of such a condition, the effect of that condition on the OPERABILITY of the affected system should be determined in a timely manner commensurate with the safety significance of the issue. Once a determination of inoperability is made that involves the TS, the actions to be followed are governed by the implementation rules presented in Section 5.8. These rules are repeated below for convenience.

IMPLEMENTATION RULES

RULE 1: Upon determining that a support or supported system is inoperable, the system is immediately declared inoperable.

RULE 2: When a support or supported system that is included in the TS is declared inoperable, the corresponding LCO is immediately entered.

RULE 3: When a support system is declared inoperable, all of its supported systems are immediately declared inoperable and the associated LCOs are entered unless otherwise justified:

a. In the Bases of the support system LCO; or

b. In the Bases of the supported system LCO, or FSAR, or both, if the support system is not included in the TS.

RULE 4: When a support or supported system is declared inoperable in one train, the corresponding independent support or supported systems and all other associated support systems in the opposite train(s) are verified to be OPERABLE to ensure that the complete capability to perform the specified safety function has not been lost (i.e., loss of functional capability).

RULE 5: Upon determining that a loss of functional capability condition exists, actions specified in the support or supported system LCOs are taken to mitigate the loss of the functional capability.

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IMPLEMENTATION GUIDANCE

The guidance for following the above rules for implementing the general principles of OPERABILITY contained in Section 5.8 is presented in three parts; each one is self contained. These parts explain how to implement the above rules for inoperable supported systems, inoperable support systems in the TS, and inoperable support systems outside the TS.

The examples discussed after the guidance illustrate how the guidance was applied to various cases of support and supported systems interactions encompassed in the TS.

a. Supported System Inoperability

1. Upon declaring a supported system inoperable, the ACTIONS of the supported system's LCO should be entered immediately for all of the Conditions that apply. The associated Required Actions should be accomplished within the specified Completion Times as required by LCO 3.0.2.

2. Upon failure to perform the Required Action to restore the supported system to an OPERABLE status (the restoration Action) by the end of the specified Completion Time; or any other remedial Required Action by the end of its specified Completion Time, Required Actions (either specified in the supported system LCO's ACTIONS or LCO 3.0.3), such as bringing the facility to a MODE outside the Applicability of the LCO, should be taken.

3. Upon declaring a supported system inoperable, a loss of function verification should be performed immediately. A supported system LCO's ACTIONS usually includes sufficient Actions to ascertain a loss of function as well as Actions to mitigate a loss of function. Therefore, the loss of function should need only be verified as directed by the supported system LCO's ACTIONS.

b. Technical Specifications Support System Inoperable

1. Upon declaring a TS support system inoperable, all of the systems that it supports should be declared

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IMPLEMENTATION GUIDANCE (continued)

inoperable at the same time, unless justified differently in the Bases for the support system LCO.

The ACTIONS for the support system LCO and the ACTIONS for all its supported system LCOs should be entered immediately for all ACTIONS Conditions that apply. All associated Required Actions should be accomplished within the specified Completion Times as required by LCO 3.0.2.

The Completion Time for accomplishing the Required Action to restore a support system to OPERABLE status (after the supported systems are declared inoperable) should not be greater than the most limiting restoration Action Completion Time of all the supported systems that are made inoperable.

2. Upon declaring a TS support system inoperable, a loss of function verification should be performed immediately. When a TS support system and its supported systems are declared inoperable at the same time, loss of function should need only be verified as directed by the LCO ACTIONS of the supported systems. This is because a supported system LCO's ACTIONS usually include sufficient Actions to ascertain a loss of function as well as Actions to mitigate a loss of function.

3. When a TS support system LCO's ACTIONS specifically permit an exception to immediately declaring a supported system inoperable, the exception is permitted for the time allowed as long as the justification for the exception is immediately verified and continues to be valid for the circumstances, and as long as no loss of function condition exists.

Such exceptions should be disregarded when performing the loss of function verification, unless justified otherwise in the Bases of the support system LCO. The LCO ACTIONS for the supported systems may be utilized to guide the loss of function verification. However, this verification should always include verification of the OPERABILITY of:

(continued)

(continued)

IMPLEMENTATION GUIDANCE (continued)

a) corresponding independent (redundant and diverse) support system(s) in the opposite train, and

b) corresponding independent (redundant and diverse) supported system(s) in the opposite train, and

c) all other associated support systems, for which an exception is permitted to immediately declaring their supported systems inoperable, in the opposite train.

If any of the above support or supported systems are found inoperable, then a loss of function condition may exist. If a loss of function exists or the justification for the exception is no longer valid for the circumstances, then all of the supported systems should be declared inoperable immediately, or the facility should be brought to a MODE outside the Applicability of the LCO by the support system LCO's ACTIONS, or both.

4. Upon failure to perform the Required Action to restore the TS support system to an OPERABLE status by the end of the specified Completion Time, or any other remedial Required Action by the end of its specified Completion Time, Required Actions such as bringing the facility to a MODE outside the Applicability of the LCO, or (if an exception was permitted) declaring supported systems inoperable, or both should be taken. Such Actions are usually specified in the TS support system LCO's ACTIONS.

c. <u>Non-Technical Specifications Support System Inoperable</u>

1. Upon declaring a non-TS support system inoperable, all of the systems that it supports should be declared inoperable at the same time, unless justified differently in the Bases of the supported system or the FSAR, or both. (If justification is in the FSAR, the supported system LCO's Bases should identify the FSAR section as a reference.) For those supported systems that are in the TS, the

(continued)

(continued)

IMPLEMENTATION GUIDANCE (continued)

ACTIONS of the supported system LCOs should be entered immediately for all ACTIONS Conditions that apply. All associated Required Actions should be accomplished within the specified Completion Times as required by LCO 3.0.2.

The time allowed for restoring the non-TS support system to OPERABLE status (after the supported systems are declared inoperable) is the most limiting restoration Action Completion Time of all the supported systems that are made inoperable.

2. Upon declaring a non-TS support system inoperable, a loss of function verification should be performed immediately. When a non-TS support system and its supported systems are declared inoperable at the same time, loss of function should need only be verified as directed by the LCO ACTIONS of the supported systems.

3. When an exception to immediately declaring a supported system inoperable is justified either by the supported system LCO Bases section or the FSAR, or both, the exception is permitted for the time stated in the justification as long as the justification is immediately verified and continues to be valid for the circumstances, and as long as no loss of function condition exists.

   Such exceptions should be disregarded when performing the loss of function verification, unless justified otherwise in the Bases of the supported system(s) LCO, or the FSAR, or both. The LCO ACTIONS for the supported systems may be utilized to guide the loss of function verification. However, this verification should always include verification of the OPERABILITY of:

   a) corresponding independent (redundant and diverse) support system(s) in the opposite train, and

   b) corresponding independent (redundant and diverse) supported system(s) in the opposite train, and

(continued)

(continued)

IMPLEMENTATION GUIDANCE (continued)

c) all other associated support systems, for which an exception is permitted to immediately declaring their supported systems inoperable, in the opposite train.

If any of the above support or supported systems are found inoperable, then a loss of function condition may exist. If a loss of function exists, or the justification for the exception is no longer valid for the circumstances, or the time allowed by the exception expires before restoring the non-TS support system to OPERABLE status, then all of the supported systems should be declared inoperable immediately, or the facility should be brought to a MODE outside the Applicability of the supported system LCOs, or both.

EXAMPLES

The above guidance for implementing the definition of OPERABILITY is intended to ensure that when a support system is found inoperable that:

a. Operation of the facility at risk is limited to the time specified by the most limiting LCO ACTIONS of the associated supported systems, or as otherwise justified;

b. The appropriate remedial Actions specified by the supported system LCO's ACTIONS (to compensate for the inoperable supported system) are taken; and

c. A total loss of the capability to perform a specified safety function does not go undetected.

As described in the above rules and guidance, these objectives are generally ensured by entering the ACTIONS of all of the supported system LCOs upon discovery of an inoperable necessary support system.

Ideally, the ACTIONS for the support system LCO should specify Required Actions that alore are sufficient to accomplish the above objectives, (i.e., that accomplish the same result that entering the ACTIONS of all of the supported system LCOs would accomplish). However, only a few of the ACTIONS for support system LCOs in the TS have been written this way.

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EXAMPLES
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The following examples illustrate how implementation of the above guidance accomplishes the above objectives for three general situations based upon the three basic ways that support system LCO ACTIONS are related to the associated supported system LCO ACTIONS. For greater clarity, these examples use the commonly used term, allowed outage time (AOT). (As discussed in Section 1.3, the term AOT refers to a Completion Time associated with a Required Action to restore compliance with the entered LCO.) In most cases, failure to meet an AOT would require a facility shutdown.

EXAMPLE 1.5-1

Situation 1. In this situation the AOT for the support system is either the same as or less than the AOT for a system it supports. Additionally, the supported system LCO's ACTIONS do not specify any special Required Actions (such as verifying redundant component OPERABILITY or performance of a Surveillance) that have Completion Times equal to or shorter than the support system's AOT. Therefore, entry into the ACTIONS of the supported system LCO will not result in shutting down the facility prior to the expiration of the support system AOT. This is the most common situation that occurs in the TS.

In this situation, however, the supported system LCO's ACTIONS should still be entered and the Completion Time clocks for the Conditions that apply should still be started. This is because:

a. Only the supported system LCO's ACTIONS specify the appropriate Action in the event that a redundant or diverse component or system covered by that LCO is already inoperable or becomes inoperable;

b. If a second independent TS support system for one of the affected supported systems becomes inoperable and the first support system is then restored to OPERABLE status, then it would be possible to operate the facility at risk with an inoperable supported system for longer than its specified AOT. (This is similar to the multiple Condition scenario within a single LCO's ACTIONS that Completion Time convention rule 1.3.3 is specified to prevent.); and

(continued)

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EXAMPLES (continued)

c. It should be also necessary to enter the ACTIONS of the supported system LCO to ensure that any special Required Action (even one with a Completion Time longer that the support system AOT) that is appropriate is recognized and accomplished.

Examples in the new STS of a support system LCO and a supported system LCO corresponding to Situation 1 are:

vs - B&W [3.5.4, Borated Water Storage Tank; and 3.5.2, Emergency Core Cooling System.]

vs - W [3.5.4, Refueling Water Storage Tank; and 3.5.2, Emergency Core Cooling System.]

vs - CE [3.5.4, Refueling Water Tank; and 3.5.2, Emergency Core Cooling System.]

vs - BWR/4 [3.8.7, Distribution Systems - Operating; and 3.7.2, Service Water System and Ultimate Heat Sink.]

vs - BWR/6 [3.8.7, Distribution Systems - Operating; and 3.6.1.7, Residual Heat Removal Containment Spray.]

<u>EXAMPLE 1.5-2</u>

<u>Situation 2</u>. In this situation, the AOT for the support system is either the same as or less than the AOT for a system it supports (the same as in Situation 1). However, the ACTIONS of the supported system LCO specify special Required Actions (other than restoration Required Actions) that have Completion Times shorter than the support system's AOT. In most cases, upon failure to accomplish such required Actions, the supported system LCO's ACTIONS require shutting down the facility; this would occur prior to the expiration of the support system's AOT.

Therefore, the supported system LCO's ACTIONS must be entered upon discovery of an inoperable necessary support system to ensure that the special Actions required by the ACTIONS of the supported system LCO are accomplished. This is because the acceptability of the AOT for a supported system is based, in part, upon the assumption that these special Actions will be accomplished.

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EXAMPLES (continued)

EXAMPLE 1.5-2 (continued)

Examples in the new STS of a support system LCO and a supported system LCO corresponding to Situation 2 are:

vs - B&W, W, CE

[3.8.7, Distribution Systems - Operating; and 3.7.9, Ultimate Heat Sink. When the AC electrical bus that supplies a cooling tower fan is inoperable.]

vs - BWR/4/6

[3.8.7, Distribution Systems - Operating; and 3.5.3, Reactor Core Isolation Cooling System. When the electrical bus that supplies a motor operated valve in the RCIC system is inoperable.]

EXAMPLE 1.5-3

Situation 3. In this situation, the AOT for the support system may be the same as, less than, or greater than the AOT for a system it supports; however, the support system LCO's ACTIONS specify that the supported system(s) be declared inoperable either immediately or after a delay period, which is usually equal to the support system's AOT.

In this case, neither the AOT for the supported system is started nor its LCO's ACTIONS entered until the delay period has expired. When such a support system is determined to be inoperable, the associated LCO Bases section should be reviewed to verify that the existing circumstances are enveloped by the justification for the delay period as stated in the Bases. If not, then the supported system LCO's ACTIONS should be entered immediately. In some cases, the delay period is allowed because of the performance of special Actions specified in the support system LCO's ACTIONS; failure to perform such Actions would also require entry into the supported system LCO's ACTIONS.

Examples in the new STS of a support system LCO and a supported system LCO corresponding to Situation 3 are:

vs - B&W

[3.3.8, Emergency Diesel Generator Loss of Power Start; and 3.8.1, AC Sources - Operating.]

vs - W

[3.3.6, Miscellaneous Safeguards Actuation (Function 1, Emergency Diesel start on loss of voltage in single bus); and 3.8.1, AC Sources - Operating.]

(continued)

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EXAMPLES (continued)

EXAMPLE 1.5-3 (continued)

vs - CE

[3.3.3, Emergency Diesel Generator Loss of Voltage Start; and 3.8.1, AC Sources - Operating.]

vs - BWR/4/6

[3.3.8.1, Loss of Power Instrumentation; and 3.8.1 AC Sources - Operating.]

[Final Note: A situation may still exist in the TS, in which the AOT for a support system is longer than the AOT for a system it supports (that does not correspond to Example 1.5-3). In this situation, the AOT for the supported system governs, unless otherwise justified. An example of this situation, if it exists, should be discussed here.]

DRAFT

2.0 SAFETY LIMITS (SLs)

2.1 SAFETY LIMITS

2.1.1 Reactor Core SLs

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

2.1.2 RCS Pressure SLs

In MODES 1, 2, 3, 4, and 5, maintain RCS pressure at ≤ [2735] psig.

2.2 SAFETY LIMIT VIOLATION

2.2.1 In MODE 1 or 2, if SL 2.1.1 is violated, restore compliance within the limits and be in MODE 3 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

2.2.2.1 In MODES 1 and 2, restore compliance within 15 minutes and be in MODE 3 within 1 hour.

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

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

2.2.4 Within 24 hours, notify the [General Manager—Nuclear Plant and Vice President—Nuclear Operations] and the [plant review methods specified in Specification 5.5.2].

2.2.5 Within 30 days of the violation, a Licensee Event Report (LER) shall be prepared pursuant to 10 CFR 50.73. The LER shall be submitted to the Commission, the [plant review methods specified in Specification 5.5.2], and the [General Manager—Nuclear Plant and Vice President—Nuclear operations].

2.2.6 Operation of the unit shall not be resumed until authorized by the Commission.

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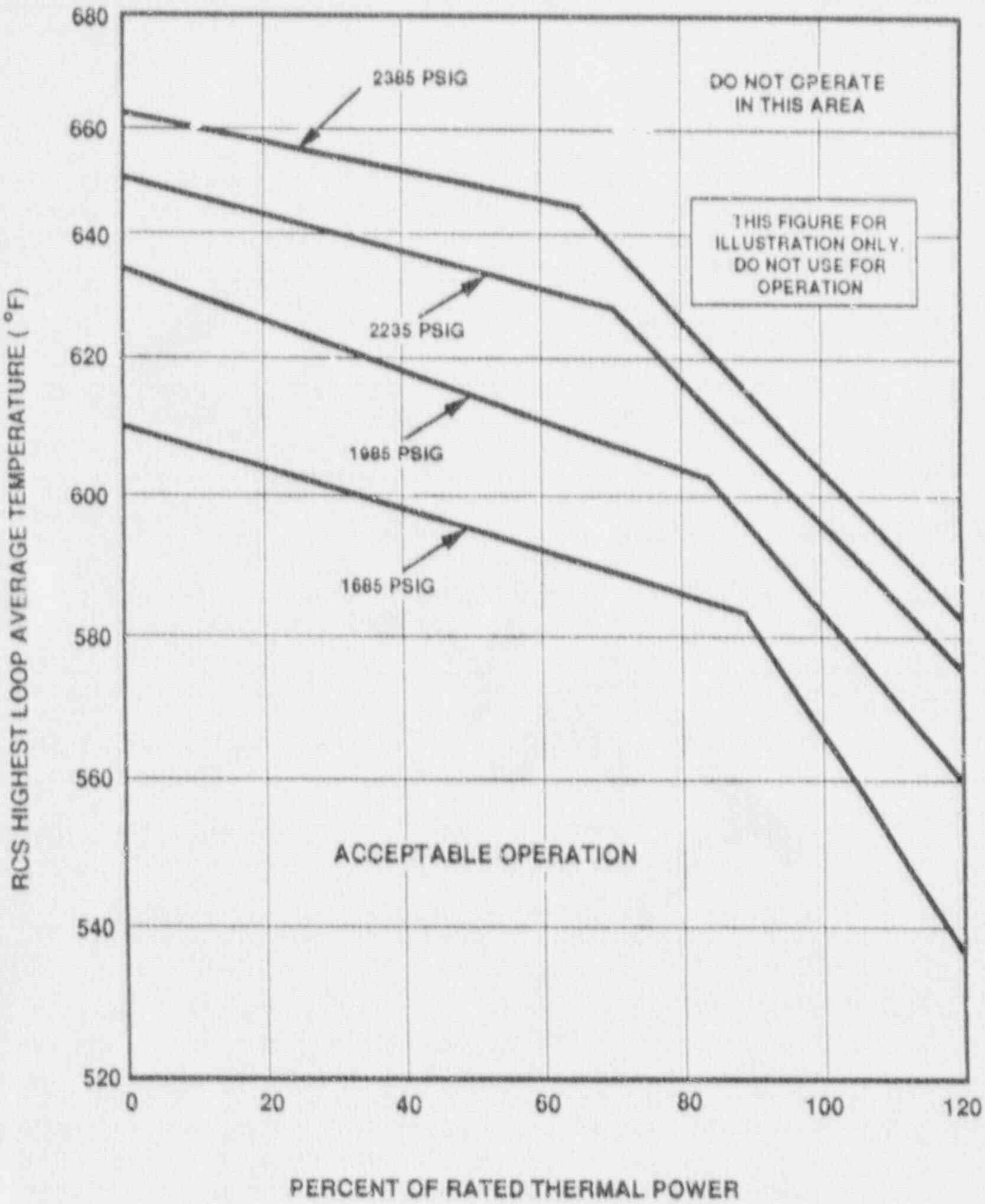

Figure 2.1.1-1
Reactor Core Safety Limits

3.0 APPLICABILITY

3.0 Limiting Conditions for Operation (LCO) Applicability

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

LCO 3.0.2 Upon discovery of a failure to meet an LCO, immediately enter the associated ACTIONS for all the Conditions that apply at the time of discovery and subsequently for any other Conditions at the time they become applicable. Perform the Required Action(s) for each Condition within the specified Completion Time(s), in accordance with the Completion Time convention of Specification 1.3.

If an entered Condition is corrected or is no longer applicable prior to expiration of its specified Completion Time(s), completing the performance of the Required Action(s) for that Condition is not required unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met or an associated ACTION is not provided, the facility 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 facility, as applicable, in:

a. MODE 3 within 7 hours;

b. MODE 4 within 13 hours; and

c. MODE 5 within 37 hours.

Exceptions to these requirements 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 applicable in MODES 1, 2, 3, and 4.

(continued)

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. Other exceptions to this specification are stated in the individual specifications. These exceptions allow entry into MODES or other specified Conditions in the Applicability when the associated ACTIONS to be entered allow facility operation in the MODE or other specified Condition for only a limited period of time.

LCO 3.0.5 Special test exception (STE) LCOs [in each applicable LCO section] allow specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with STE LCOs is optional. When an STE LCO is desired to be met but is not met, the ACTIONS of the STE LCO shall be taken in lieu of the ACTIONS of the applicable specifications. When an STE LCO is not desired to be met, entry into a MODE or other specified Condition in its Applicability shall only be made in accordance with the other applicable specifications.

[NOTE: The decision to retain this LCO is pending review of the Bases for the STE LCOs.]

3.0 APPLICABILITY

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 an SR, 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. Surveillances do not have to be performed on inoperable equipment or variables outside specified limits; however, successful performance of the Surveillances is necessary for a determination of OPERABILITY.
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. For Frequencies specified as "once," the above interval extension does not apply. If a Required Action requires performance of a Surveillance or its Completion Time requires periodic performance of "once per...," the above Frequency extension applies to the repetitive portion, but not to the initial portion of the Completion Time. Exceptions to these requirements 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 equipment inoperable or the variable outside the specified limits may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Surveillance interval, whichever is less. This delay period is permitted to allow performance of the Surveillance. (continued)

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SR 3.0.3 (continued)	If the Surveillance is not performed within the delay period, then upon expiration of the delay period the equipment must be declared inoperable, or the variable declared outside the specified limits, and the applicable Condition(s) of the associated LCO must be entered. The Completion Times of the Required Actions begin immediately upon expiration of the delay period. When the Surveillance is performed within the delay period but the Surveillance is failed, immediately upon failure of the Surveillance the equipment must be declared inoperable, or the variable declared outside the specified limits, and the applicable Condition(s) of the associated LCO must be entered. The Completion Times of the Required Actions begin immediately upon failure of the Surveillance.
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 SRs and the applicable Section 5.7.4 Program requirements have been met. This provision shall not prevent passage through or to MODES or other specified Conditions in compliance with Required Actions. Exceptions to these requirements are stated in the individual specifications. Each SR, for which an exception to SR 3.0.4 is stated in the individual specifications, shall be met within a Completion Time of 12 hours after entering the prerequisite MODE or other specified Condition in the Applicability of the associated LCO, unless otherwise specified.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM) — T_{avg} > 200°F

LCO 3.1.1 The SDM shall be ≥ [1.6]% Δk/k.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM is ≥ [1.6]% Δk/k.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 SHUTDOWN MARGIN — $T_{avg} \le 200°F$

LCO 3.1.2 The SDM shall be ≥ [1.0]% Δk/k.

APPLICABILITY: MODE 5.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify SDM is ≥ [1.0]% Δk/k.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Core Reactivity

LCO 3.1.3 The measured core reactivity shall be within ±1% Δk/k of predicted values.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Measured core reactivity not within limit.	A.1 Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation.	72 hours
	AND	
	A.2 Establish appropriate operating restrictions and SRs.	72 hours
B. Required Actions and associated Completion Times not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	--------------------NOTES------------------ 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 (EFPDs) after each fuel loading. 2. SR 3.0.4 is not applicable. -- Verify measured core reactivity is within ±1% Δk/k of predicted values.	Prior to entering MODE 1 after fuel loading AND -----NOTE----- Only required after 60 EFPDs -------------- 31 EFPDs

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Moderator Temperature Coefficient (MTC)

LCO 3.1.4 The MTC shall be maintained within the limits specified in the CORE OPERATING LIMITS REPORT (COLR).

-----------------------------NOTE-----------------------------
The maximum upper limit shall be [≤ [ ] Δk/k °F at hot zero power] [that specified in Figure 3.1.4-1].

APPLICABILITY: MODE 1, and MODE 2 with K_{eff} ≥ 1.0 for the upper MTC limit, MODES 1, 2, and 3 for the lower MTC limit.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. MTC not within upper limit.	A.1	--------NOTE-------- Subsequent operation is permitted. The requirements of LCO 3.1.7, "Control Bank Insertion Limits," remain applicable. -------------------- Establish administrative withdrawal limits for control banks to maintain MTC within limit.	 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2 with $K_{eff} < 1.0$.	6 hours
C. MTC not within lower limit.	C.1 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
-----NOTE----- SR 3.0.4 is not applicable.	
SR 3.1.4.1 Verify MTC within upper limit.	After each refueling prior to entering MODE 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	Verify MTC within 300 ppm surveillance limit specified in the COLR.	-----NOTE------ Required within 7 effective full power days (EFPDs) after reaching the equivalent of an equilibrium RATED THERMAL POWER (RTP)-all rods out (ARO) boron concentration of 300 ppm --------------- Each cycle
SR 3.1.4.3	-------------------NOTES------------------- 1. If the MTC is more negative than the 300 ppm surveillance limit specified in the COLR, SR 3.1.4.3 shall be repeated once per 14 EFPDs during the remainder of the fuel cycle. 2. SR 3.1.4.3 need not be repeated if the MTC measured at the equivalent of equilibrium RATED THERMAL POWER - All Rods Out (RTP-ARO) boron concentration of ≤ 60 ppm is less negative than the 60 ppm surveillance limit specified in the COLR. --- Verify MTC within lower limit.	------NOTE----- Required within 7 EFPDs after reaching the equivalent of an equilibrium RTP-ARO boron concentration of 300 ppm --------------- Each cycle

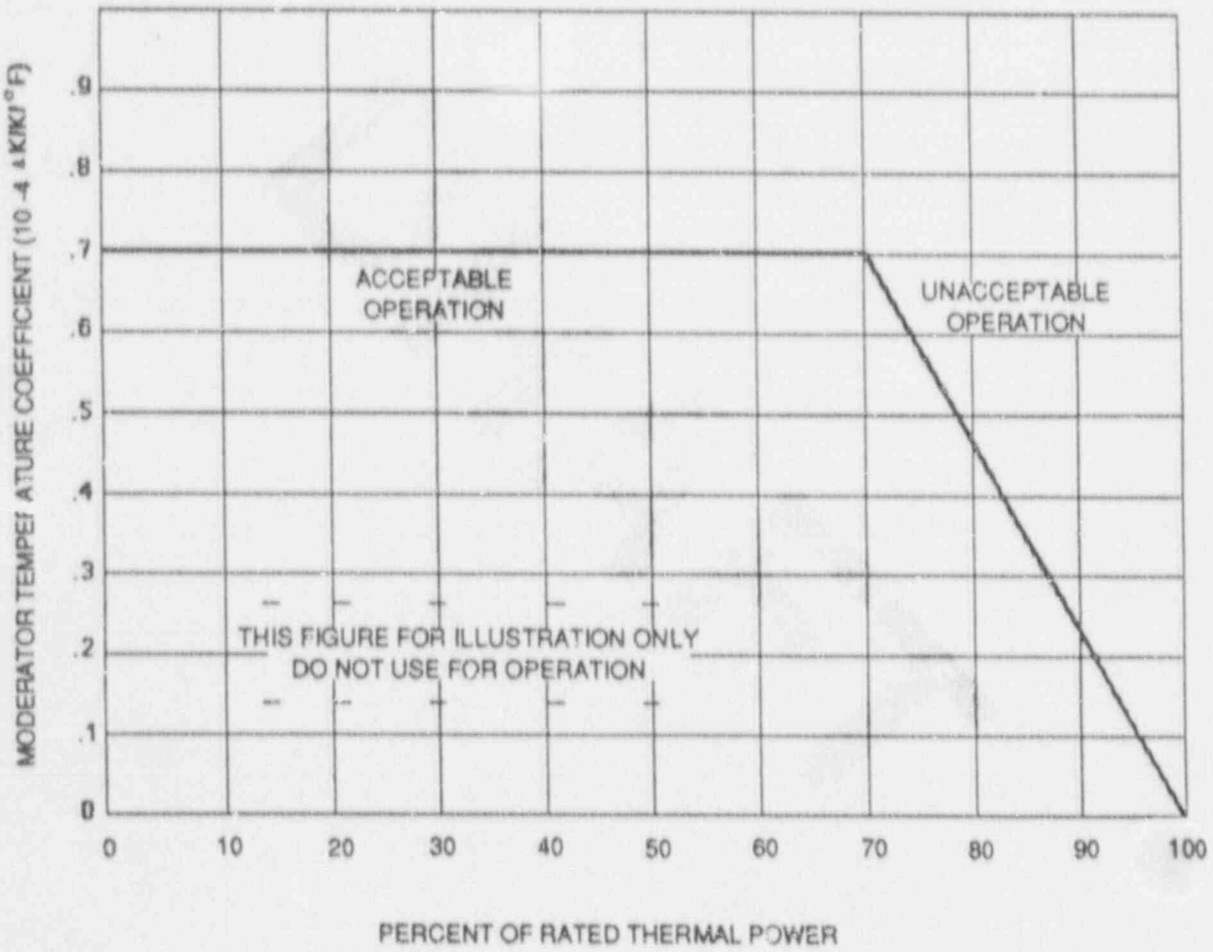

Figure 3.1.4-1

Moderator Temperature Coefficient vs. Power Level

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Rod Group Alignment Limits

LCO 3.1.5 All shutdown and control rods shall be OPERABLE with all individual indicated rod positions within 12 steps of their group step counter demand position.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more rod(s) inoperable due to being immovable, as a result of excessive friction or mechanical interference, or known to be untrippable.	A.1.1	Perform SR 3.1.1.1 (SHUTDOWN MARGIN (SDM) verification).	1 hour
		OR	
	A.1.2	Initiate boration to restore SDM within limit.	1 hour
	AND		
	A.2	Be in MODE 3.	6 hours
B. One rod not within alignment limits.	B.1	Restore rod within alignment limits.	1 hour
	OR		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	---------NOTE--------- Maintain bank sequence and insertion limits of LCO 3.1.6 and LCO 3.1.7, with changes to rod position or THERMAL POWER level, during subsequent operation. --------------------- Realign remainder of rods, in the group with the misaligned rod, to within alignment limit.	1 hour
	OR		
	B.3.1.1	Perform SR 3.1.1 1 (SDM verification).	1 hour
		OR	
	B.3.1.2	Initiate boration to restore SDM within limit.	1 hour
	AND		
	B.3.2	Reduce THERMAL POWER to ≤ 75% RATED THERMAL POWER (RTP).	2 hours
	AND		
	B.3.3	Reduce Power Range Neutron Flux—High trip setpoints to ≤ 85% RTP.	6 hours
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.4 Perform SR 3.1.1.1 (SDM verification).	Once per 12 hours
	<u>AND</u>	
	B.3.5 Perform SR 3.2.1.1 ($F_Q(Z)$ verification).	72 hours
	<u>AND</u>	
	B.3.6 Perform SR 3.2.2.1 ($F^N_{\Delta H}$ verification).	72 hours
	<u>AND</u>	
	B.3.7 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	5 days
C. More than 1 rod not within alignment limit.	C.1 Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more rod(s) aligned and trippable but immovable due to an electrical problem(s) in the Rod Control System.	D.1	----------NOTE------- Maintain bank sequence and insertions limits of LCO 3.1.6 and LCO 3.1.7, with changes to rod position or THERMAL POWER, during subsequent operation. -------------------- Restore rods to OPERABLE status.	72 hours
E. Required Actions and associated Completion Times for Conditions B or D not met.	E.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify individual rod positions within alignment limit as follows:	
	a. With the rod position deviation monitor inoperable.	4 hours
	OR	
	b. With the rod position deviation monitor OPERABLE.	12 hours
SR 3.1.5.2	Move each rod not fully inserted in the core at least 10 steps in either direction.	92 days
SR 3.1.5.3	Demonstrate rod drop time of each rod, from the fully withdrawn position, is $\leq$ [2.2] seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500°F$, and b. All reactor coolant pumps operating.	Prior to reactor criticality after removal of the reactor head AND 18 months

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Shutdown Bank Insertion Limits

LCO 3.1.6 Each Shutdown Bank shall be within its physical insertion limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 beginning within 15 minutes prior to initial control bank withdrawal during an approach to criticality.

-------------------------NOTE-------------------------
This LCO is not applicable while performing SR 3.1.5.2 (Rod Freedom Test).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limit(s).	A.1 Initiate boration to restore SHUTDOWN MARGIN to $\geq$ [1.6%] $\Delta k/k$. AND A.2 Restore shutdown banks to within limit(s).	15 minutes 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	---NOTE--- SR 3.0.4 is not applicable. ---	
	Verify each shutdown bank within limit.	Once within 15 minutes prior to initial control bank withdrawal during an approach to criticality AND 12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Control Bank Insertion Limits

LCO 3.1.7 Control banks shall be within the insertion, sequence, and overlap limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1 and 2.

------------------------NOTE------------------------
This LCO is not applicable while performing SR 3.1.5.2 (Rod Freedom Test).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Control Bank insertion limits(s) not met.	A.1	Initiate boration to restore SHUTDOWN MARGIN (SDM) to $\geq$ 1% $\Delta k/k$.	15 minutes
	<u>AND</u>		
	A.2	Restore control bank(s) to within limit(s).	2 hours
B. Control bank(s) sequence or overlap limits not met.	B.1	Initiate boration to restore SDM to $\geq$ 1% $\Delta k/k$.	15 minutes
	<u>AND</u>		
	B.2	Restore control bank(s) sequence or overlap to meet limits.	2 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Actions and associated Completion Times of Condition A or B not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify estimated critical control bank position within limits.	Within 4 hours prior to achieving criticality
SR 3.1.7.2	--------------------NOTE------------------ SR 3.0.4 is not applicable. --- Verify each control bank insertion within limits as follows: a. With the rod insertion limit monitor inoperable. b. With the rod insertion limit monitor OPERABLE.	 4 hours 12 hours
SR 3.1.7.3	--------------------NOTE------------------ SR 3.0.4 is not applicable. --- Verify sequence and overlap limits met for control banks not fully withdrawn from the core.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 Rod Position Indication

LCO 3.1.8 The [Digital] Rod Position Indication System and the Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One [digital] rod position indicator per group inoperable for 1 or more groups.	A.1	Verify the position of the rods with inoperable position indicators by using movable incore detectors.	Once per 8 hours
	OR		
	A.2	Reduce THERMAL POWER to ≤ 50% of RATED THERMAL POWER (RTP).	8 hours
B. One or more rods with inoperable position indicators have been moved in excess of 24 steps in 1 direction since the last determination of the rod's position.	B.1	Verify the position of the rods with inoperable position indicators by using movable incore detectors.	8 hours
	OR		
	B.2	Reduce THERMAL POWER to ≤ 50% RTP.	8 hours

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify each [digital] rod position indicator agrees within 12 steps of the group demand position for the [full indicated range] of rod travel.	18 months

3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 <u>MODE 1 PHYSICS TESTS Exceptions</u>

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

LCO 3.1.5 "Rod Group Alignment Limits,"
LCO 3.1.6 "Shutdown Bank Insertion Limit,"
LCO 3.1.7 "Control Bank Insertion Limits,"
LCO 3.2.3 "AXIAL FLUX DIFFERENCE," and
LCO 3.2.4 "QUADRANT POWER TILT RATIO"

may be suspended provided:

a. THERMAL POWER is maintained ≤ 85% RATED THERMAL POWER (RTP), and

b. Power Range Neutron Flux—High trip setpoints are ≤ 10% of RTP above the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP.

APPLICABILITY: MODE 1 when performing PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER not within limit.	A.1 Reduce THERMAL POWER to within limit. <u>OR</u> A.2 Suspend PHYSICS TEST exceptions.	1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Power Range Neutron Flux—High trip setpoints > 10% RTP above the PHYSICS TESTS power level. OR Power Range Neutron Flux—High trip setpoints > 90% RTP.	B.1	Restore Power Range Neutron Flux—High trip setpoints to ≤ 10% above the PHYSICS TESTS power level, or to ≤ 90% RTP, whichever is lower.	1 hour
	OR		
	B.2	Suspend PHYSICS TEST exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify THERMAL POWER ≤ 85% RTP.	1 hour
SR 3.1.9.2	Verify Power Range Neutron Flux—High trip setpoints within limit.	Within 8 hours prior to initiation of PHYSICS TESTS
SR 3.1.9.3	Perform SR 3.2.1.1 ($F_Q(Z)$ verification) and SR 3.2.2.1 ($F^N_{\Delta H}$ verification)	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.10 MODE 2 PHYSICS TESTS Exceptions

LCO 3.1.10 During the performance of PHYSICS TESTS, the requirements of

LCO 3.1.4 "Moderator Temperature Coefficient,"
LCO 3.1.5 "Rod Group Alignment Limits,"
LCO 3.1.6 "Shutdown Bank Insertion Limit,"
LCO 3.1.7 "Control Bank Insertion Limits," and
LCO 3.4.2 "RCS Minimum Temperature for Criticality"

may be suspended provided:

a. THERMAL POWER is maintained ≤ 5% RATED THERMAL POWER, and

b. Reactor Coolant System (RCS) lowest loop average temperature is ≥ [531]°F.

APPLICABILITY: MODE 2 when performing PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. THERMAL POWER not within limit.	A.1	Open reactor trip breakers.	Immediately
B. RCS lowest loop average temperature not within limit.	B.1	Restore RCS lowest loop average temperature to within limit.	15 minutes
	OR		
	B.2	Be in MODE 3.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.10.1	Perform an ANALOG CHANNEL OPERATIONAL TEST on each power-range and intermediate-range channel.	Within 12 hours prior to initiaticn of PHYSICS "ESTS
SR 3.1.10.2	Verify the RCS lowest loop average temperature within limit.	30 minutes
SR 3.1.10.3	Verify THERMAL POWER within limit.	1 hour

3.1 REACTIVITY CONTROL SYSTEMS

3.1.11 SHUTDOWN MARGIN (SDM) Test Exceptions

LCO 3.1.11 The SDM requirements of LCO 3.1.1 may be suspended provided the reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s).

APPLICABILITY: MODE 2 when measuring control rod worth and SDM.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more control rods not fully inserted. AND Available trip reactivity from OPERABLE control rods < the highest estimated control rod worth.	A.1 Initiate boration to restore SDM to within limit.	15 minutes
B. All control rods fully inserted. AND Reactor subcritical by < the highest estimated control rod worth.	B.1 Initiate boration to restore SDM to within limits.	15 minutes

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.11.1	----------------NOTE--------------------- Only required for control rods not fully inserted. -- Determine the position of each control rod.	2 hours
SR 3.1.11.2	----------------NOTE--------------------- Only required for control rods not fully inserted. -- Trip each control rod from $\geq$ the 50% withdrawn position and verify full control rod insertion.	Within 24 hours prior to reducing SDM outside limits

3.2 POWER DISTRIBUTION LIMITS

3.2.1A <u>Heat Flux Hot Channel Factor</u> ($F_Q(Z)$) (F_{xy} Methodology) (Constant Axial Offset Control (CAOC) - AXIAL FLUX DIFFERENCE (AFD) Limits)

LCO 3.2.1A ($F_Q(Z)$), shall be within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. $F_Q(Z)$ not within limit.	A.1 Reduce THERMAL POWER at least 1% RATED THERMAL POWER (RTP) for each 1% $F_Q(Z)$ exceeds limit.	15 minutes
	<u>AND</u>	
	A.2 Reduce AFD acceptable operation limits by the percentage $F_Q(Z)$ exceeds limit.	4 hours
	<u>AND</u>	
	A.3 Reduce Power Range Neutron Flux—High trip setpoints at least 1% for each 1% $F_Q(Z)$ exceeds limit.	8 hours
	<u>AND</u>	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.4	Reduce Overpower ΔT trip setpoints at least 1% for each 1% $F_Q(Z)$ exceeds limit.	72 hours
	<u>AND</u>		
	A.5	Perform SR 3.2.1.1 (F_Q verification) and SR 3.2.1.2 (F_{XY} verification).	Prior to increasing THERMAL POWER above the limit of A.1
B. Required Actions and associated Completion Times of Condition A not met <u>OR</u> $F_Q(Z)$ cannot be determined because of incore detector system inoperability.	B.1	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	------------------------NOTE------------------------ SR 3.0.4 is not applicable. -- Verify measured values of $F_Q(Z)$ within limits.	31 effective full power days (EFPD) AND Prior to exceeding 75% RTP after each refueling
SR 3.2.1.2	------------------------NOTE------------------------ 1. If $F^C_{xy} > F^L_{xy}$, evaluate the effect of F_{xy} on the predicted $F^{PR}_q(Z)$ to determine if $F_Q(Z)$ is within its limit. 2. If $F^{RTP}_{xy} < F^C_{xy} \leq F^L_{xy}$ SR 3.2.1.2 shall be repeated within 24 hours after exceeding $\geq$ 20% RTP, the THERMAL POWER at which F^C_{xy} was last determined. 3. SR 3.0.4 is not applicable. -- Verify $F^C_{xy} < F^L_{xy}$	31 EFPD AND Prior to exceeding 75% RTP after each refueling

3.2 POWER DISTRIBUTION LIMITS

3.2.1B <u>Heat Flux Hot Channel Factor ($F_Q(Z)$) (F_Q Methodology)</u> (Relaxed Axial Offset Control (RAOC) - AXIAL FLUX DIFFERENCE (AFD))

LCO 3.2.1B ($F_Q(Z)$), as approximated by $F_Q^C(Z)$ and $F_Q^W(Z)$, shall be within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1.

ACTIONS

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. $F_Q^W(Z)$ not within limits.	B.1	Reduce AFD limits at least 1% for each 1% $F_Q^W(Z)$ exceeds limit.	2 hours
C. Required Actions and associated Completion Times of Conditions A or B not met OR $F_Q^C(Z)$ or $F_Q^W(Z)$ or both cannot be determined because of incore detector system inoperability.	C.1	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	-------------------NOTES------------------- 1. During power escalation at the beginning of each cycle, THERMAL POWER may be increased until a power level for extended operation has been achieved at which a power distribution map is obtained. 2. SR 3.0.4 is not applicable. -- Verify $F_Q^C(Z)$ within limit.	31 effective full power days (EFPD) <u>AND</u> Upon achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> Prior to exceeding 75% RTP after each refueling

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.1.2	-------------------NOTES------------------- 1. If $F_Q^W(Z)$ is within limits and measurements indicate maximum over Z $\left[\frac{F_Q^C(Z)}{K(Z)}\right]$ has increased since the previous evaluation of $F_Q^C(Z)$: a. Increase $F_Q^W(Z)$ by a factor of [1.0815] and reverify that $F_Q^W(Z)$ is within limits; or b. SR 3.2.1.2 shall be repeated once per 7 EFPD until 2 successive flux maps indicate maximum over Z $\left[\frac{F_Q^C(Z)}{K(Z)}\right]$ has not increased. 2. SR 3.0.4 is not applicable. ---	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued) Verify $F_Q^W(Z)$ within limits.	31 EFPD AND Upon achieving equilibrium conditions after exceeding, by $\geq$ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND Prior to exceeding 75% RTP after each refueling

3.2 POWER DISTRIBUTION LIMITS

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

LCO 3.2.2 The $F^N_{\Delta H}$ shall be within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1.

ACTIONS

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	Perform SR 3.2.2.1 ($F^N_{\Delta H}$ verification).	24 hours
	AND		
	A.3	---------NOTE------- THERMAL POWER does not have to be reduced to comply with this Required Action. --------------------	
		Perform SR 3.2.2.1 ($F^N_{\Delta H}$ verification).	Prior to exceeding 50% RTP AND Prior to exceeding 75% RTP AND 24 hours after reaching $\geq$ 95% RTP
B. Required Actions and associated Completion Times not met. OR $F^N_{\Delta H}$ cannot be determined because of incore detector system inoperability.	B.1	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	---NOTE--- SR 3.0.4 is not applicable. --- Verify $F^N_{\Delta H}$ within limits.	31 effective full power days AND Prior to exceeding 75% RTP after each refueling

3.2 POWER DISTRIBUTION LIMITS

3.2.3A AXIAL FLUX DIFFERENCE (AFD) (Constant Axial Offset Control (CAOC) Methodology)

LCO 3.2.3 The AFD:

a. Shall be maintained within the target band about the target flux difference. The target band is specified in the CORE OPERATING LIMITS REPORT (COLR).

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

b. May deviate outside the target band with THERMAL POWER < 90% but ≥ 50% RATED THERMAL POWER (RTP), provided AFD is within the acceptable operation limits and cumulative penalty deviation time is ≤ 1 hour during the previous 24 hours. The acceptable operation limits are specified in the COLR.

--------------------------NOTE--------------------------
Penalty deviation time shall be accumulated on the basis of 1-minute penalty deviation for each minute of power operation with AFD outside the target band.
----

c. May deviate outside the target band with THERMAL POWER < 50% RTP.

--------------------------NOTE--------------------------
Penalty deviation time shall be accumulated on the basis of one-half minute penalty deviation for each 1 minute of power operation with AFD outside the target band.

APPLICABILITY: MODE 1 with THERMAL POWER > 15% RTP.

--------------------------NOTE--------------------------
A total of 16 hours of operation may be accumulated with AFD outside the target band without penalty deviation time while performing surveillance testing of power range channels in accordance with SR 3.3.1.6 (incore-excore calibration), provided AFD is maintained within acceptable operation limits.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER $\geq$ 90% RTP <u>AND</u> AFD not within the target band.	A.1 Restore AFD to within target band. <u>OR</u> A.2 Reduce THERMAL POWER to < 90% RTP.	15 minutes 15 minutes
B. ---------NOTE--------- Required Actions B.1 and B.2 must be completed whenever Condition B is entered. -------------------- Required Actions and associated Completion Times of Condition A not met <u>OR</u> AFD in Condition A cannot be determined because of excore detector system inoperability.	B.1 Reduce THERMAL POWER to < 50% RTP. <u>AND</u> B.2 Reduce Power Range Neutron Flux—High trip setpoints to $\leq$ 55% RTP.	5 minutes 8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------NOTE---------- Required Actions C.1.1 and C.1.2, or C.2 must be completed whenever Condition C is entered. ---------------------- THERMAL POWER < 90% and ≥ 50% RTP AND Cumulative penalty deviation time > 1 hour during the previous 24 hours. OR AFD not within the target band and not within the acceptable operation limits or AFD still not able to be determined because of excore detector system inoperability.	C.1.1	Reduce THERMAL POWER to < 50% RTP.	30 minutes
		AND	
	C.1.2	Reduce Power Range Neutron Flux—High trip setpoints to ≤ 55% RTP.	8 hours
	OR		
	C.2	Reduce THERMAL POWER to < 15% RTP.	9 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel.	7 days
SR 3.2.3.2	---------------------NOTE-------------------- Assume logged values of AFD exist during the preceding time interval. --- Verify AFD within limits and log AFD for each OPERABLE excore channel: a. With THERMAL POWER ≥ 90% RTP. OR b. With THERMAL POWER > 15% and < 90% RTP.	-----NOTE----- Only required if AFD monitor alarm inoperable ------------- 15 minutes 1 hour
SR 3.2.3.3	---------------------NOTE-------------------- SR 3.0.4 is not applicable. --- Update target flux difference of each OPERABLE excore channel by: a. Determining the target flux difference in accordance with SR 3.2.3.4, or b. Using linear interpolation between the most recently measured value, and either the predicted value for the end of cycle or 0% AFD.	31 effective full power days (EFPD)

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.3.4	-----NOTE----- SR 3.0.4 is not applicable. ----- Determine, by measurement, the target flux difference of each OPERABLE excore channel.	92 EFPD

3.2 POWER DISTRIBUTION LIMITS

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

LCO 3.2.3 The AFD in %-flux-difference units shall be maintained within the limits specified in the CORE OPERATING LIMITS REPORT.

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

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RATED THERMAL POWER (RTP).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. AFD not within limits.	A.1	Restore AFD to within limits.	15 minutes
	OR		
		--------NOTE--------- Required Action A.2.2 must be completed if Required Action A.2.1 is completed. ---------------------	
	A.2.1	Reduce THERMAL POWER to < 50% RTP.	30 minutes
	AND		
	A.2.2	Reduce Power Range Neutron Flux—High trip setpoints to ≤ 55% RTP.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	-------------NOTE-- --------- Required Action B.1.2 must be completed if Required Action B.1.1 is completed. ----------------------------	
B. AFD cannot be determined because of excore detector system inoperability.	B.1.1 Reduce THERMAL POWER to < 50% RTP. AND B.1.2 Reduce Power Range Neutrol Flux—High trip setpoints to ≤ 55% RTP.	30 minutes 8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel as follows:	
	a. With the AFD monitor alarm inoperable;	1 hour
	OR	
	b. With AFD monitor alarm OPERABLE.	7 days

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be $\leq$ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RATED THERMAL POWER (RTP).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPTR outside limit.	A.1 Reduce THERMAL POWER at least 3% from RTP for each 1% of QPTR > 1.00.	2 hours AND Once per 12 hours thereafter
	AND	
	A.2 Reduce Power Range Neutron Flux—High trip setpoints at least 3% for each 1% of QPTR > 1.00.	8 hours AND Once per 12 hours thereafter
	AND	
	A.3 Perform SR 3.2.1.1 (Heat Flux Hot Channel Factor ($F_Q(Z)$) verification) and SR 3.2.2.1 (Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$) verification)	24 hours AND Once per 7 days thereafter
	AND	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.4.1	Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition at RTP.	Prior to increasing THERMAL POWER to RTP
	<u>AND</u>		
	A.4.2	--------NOTE--------- Only perform Required Action A.4.2 after A.4.1 is completed. --------------------- Calibrate excore detectors to show zero QPTR.	Prior to increasing THERMAL POWER to RTP
	<u>AND</u>		
	A.4.3	---------NOTE-------- Only perform Required Action A.4.3 after A.4.2 is completed. --------------------- Perform SR 3.2.1.1 (F_Q verification) and SR 3.2.2.2 ($F^N_{\Delta H}$ verification)	24 hours after reaching RTP <u>OR</u> Within 48 hours after increasing THERMAL POWER

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Actions and associated Completion Times not met. OR QPTR cannot be determined because of incore or excore detector system inoperability.	B.1 Reduce THERMAL POWER to $\leq$ 50% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	Verify QPTR within limit by calculating QPTR as follows:	
	a. With QPTR alarm inoperable;	12 hours
	OR	
	b. With QPTR alarm OPERABLE.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.4.2	--------------------NOTES------------------- 1. Only required if one power range channel is inoperable with THERMAL POWER ≥ 75% RTP. 2. With one Nuclear Instrumentation System channel inoperable, indicated tilt may be changed from the value obtained with all four channels OPERABLE by confirming that no change in tilt has actually occurred. This verification can be accomplished by either of these two methods. With one power range channel inoperable, the quadrant tilt from this surveillance should be within a nominal value of 2% of the previous tilt as determined by the prior flux map. ---	
	Verify QPTR within limit with the movable incore detectors by: a. Using two sets of 4 thimble locations with quarter-core symmetry; <u>OR</u> b. Taking a power distribution flux map.	12 hours

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

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

APPLICABILITY: According to Table 3.3.1-1.

-----------------------------NOTE-----------------------------
For this LCO, each function is treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable for one or more functions.	A.1 Enter the Condition(s) referenced in Table 3.3.1-1 for each inoperable channel.	Immediately
B. One channel inoperable.	B.1 Restore channel to OPERABLE status. <u>OR</u> B.2.1 Be in MODE 3. <u>AND</u> B.2.2 Open Reactor Trip Breakers.	48 hours 54 hours 55 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One channel inoperable.	C.1	Restore channel to OPERABLE status.	48 hours
	OR		
	C.2	Open Reactor Trip Breakers.	49 hours
	------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels and setpoint adjustment. ----------------------------		
D. One channel inoperable.	D.1	Restore channel to OPERABLE status.	4 hours
	OR		
	D.2.1	Reduce THERMAL POWER to ≤ 75% RATED THERMAL POWER (RTP).	4 hours
	AND		
	D.2.2	Place channel in trip.	6 hours
	AND		
	D.2.3	Reduce power range--high trip setpoint to ≤ [85]% RTP.	8 hours
	OR		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.3.1	Place channel in trip.	6 hours
	<u>AND</u>		
	D.3.2	Perform SR 3.2.4.2, QUADRANT POWER TILT RATIO verification.	Once per 12 hours
	<u>OR</u>		
	D.4	Be in MODE 3.	12 hours
	-----------NOTE------------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -----------------------------		
E. One channel inoperable.	E.1	Restore channel to OPERABLE status.	6 hours
	<u>OR</u>		
	E.2	Place channel in trip.	6 hours
	<u>OR</u>		
	E.3	Be in MODE 3.	12 hours
F. THERMAL POWER between P-6 and P-10, one channel inoperable.	F.1	Restore channel to OPERABLE status.	2 hours
	<u>OR</u>		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. (continued)	F.2	Reduce THERMAL POWER to < P-6.	2 hours
	<u>OR</u>		
	F.3	Increase THERMAL POWER to > P-10, unless required to comply with Required Action G.3.	2 hours
G. THERMAL POWER between P-6 and P-10, two channels inoperable.	G.1	Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>		
	G.2.1	Restore one channel to OPERABLE status.	2 hours
	<u>OR</u>		
	G.2.2	Reduce THERMAL POWER to < P-6.	2 hours
H. THERMAL POWER below P-6, one or two channels inoperable.	H.1	Restore channels to OPERABLE status.	Prior to increasing THERMAL POWER above P-6
I. One channel inoperable.	I.1	Suspend operations involving positive reactivity additions.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. Two channels inoperable.	J.1	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	J.2	Open Reactor Trip Breakers.	Immediately
K. One channel inoperable.	K.1	Restore channel to OPERABLE status.	48 hours
	OR		
	K.2.1	Open Reactor Trip Breakers.	49 hours
	AND		
	K.2.2	Suspend operations involving positive reactivity additions.	49 hours
	AND		
	K.2.3	Perform Required Action A.2 of LCO 3.9.2, "Secure Unborated Water Source Isolation Valves."	49 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
L. All channels inoperable.	L.1	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	L.2	Perform Required Action A.2 of LCO 3.9.2, "Secure Unborated Water Source Isolation Valves."	1 hour
	AND		
	L.3	Perform SR 3.1.1.1, SHUTDOWN MARGIN verification.	1 hour AND Once per 12 hours thereafter
	------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ----------------------------		
M. One channel inoperable.	M.1	Restore channel to OPERABLE status.	6 hours
	OR		
	M.2	Place channel in trip.	6 hours
	OR		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. (continued)	M.3 Reduce THERMAL POWER to < P-7.	12 hours
	-------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -----------------------------	
N. One channel inoperable.	N.1 Restore the channel to OPERABLE status.	6 hours
	<u>OR</u>	
	N.2 Place channel in trip.	6 hours
	<u>OR</u>	
	N.3 Reduce THERMAL POWER to < P-8.	10 hours
	-------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -----------------------------	
O. One channel inoperable.	O.1 Restore channel to OPERABLE status.	6 hours
	<u>OR</u>	
	O.2 Reduce THERMAL POWER to < P-8.	10 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ----------------------------		
P. One channel inoperable.	P.1	Restore channel to OPERABLE status.	6 hours
	OR		
	P.2	Place channel in trip.	6 hours
	OR		
	P.3	Reduce THERMAL POWER to < [P-9].	10 hours
	------------NOTE------------ One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------------------------		
Q. One train inoperable.	Q.1	Restore train to OPERABLE status.	6 hours
	OR		
	Q.2	Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	-------------NOTE------------ One channel may be bypassed for up to 2 hours for surveillance testing. One channel of Reactor Trip Breaker and RTS logic functions may be bypassed for up to 2 hours for maintenance on undervoltage or shunt trip mechanisms. This is permitted provided the other channels are OPERABLE. ------------------------------		
R. One channel inoperable.	R.1	Restore channel to OPERABLE status.	1 hour
	<u>OR</u>		
	R.2	Be in MODE 3.	7 hours
S. One channel inoperable.	S.1	Verify interlock is in required state for existing plant conditions.	1 hour
	<u>OR</u>		
	S.2	Be in MODE 3.	7 hours
T. One channel inoperable.	T.1	Verify interlock is in required state for existing plant conditions.	1 hour
	<u>OR</u>		
	T.2	Be in MODE 2.	7 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
U. One trip mechanism inoperable for one Reactor Trip Breaker.	U.1	Restore inoperable trip mechanism to OPERABLE status.	48 hours
	OR		
	U.2	Be in MODE 3.	54 hours
V. One channel or train inoperable.	V.1	Verify that all required support and supported features associated with the other redundant channel(s) or train(s) are OPERABLE. If verification determines loss of functional capability, enter LCO 3.0.3 immediately unless the loss of functional capability is allowed in the support or supported feature LCO.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
----------NOTE---------- Refer to Table 3.3.1-1 to determine which SRs shall be performed for each RTS function. ------------------------	
SR 3.3.1.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2 ----------NOTES---------- 1. The CHANNEL CALIBRATION shall consist only of a comparison of Nuclear Instrumentation System (NIS) channel with results of the calorimetric. 2. Adjust NIS channel if absolute difference is > 2%. 3. SR 3.0.4 is not applicable. ------------------------ Perform CHANNEL CALIBRATION.	-----NOTE----- Only required when THERMAL POWER is > 15% of RTP -------------- 24 hours
SR 3.3.1.3 ----------NOTES---------- 1. The CHANNEL CALIBRATION shall consist only of a comparison of NIS AXIAL FLUX DIFFERENCE with results of the incore system. 2. Recalibrate NIS channel if absolute difference is ≥ 3%. 3. SR 3.0.4 is not applicable. ------------------------ Perform CHANNEL CALIBRATION.	-----NOTE----- Only required when THERMAL POWER is > 15% of RTP -------------- 31 effective full power days (EFPDs)

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.4	---NOTE--- This test must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service. ------ Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	 31 days on a STAGGERED TEST BASIS
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.1.6	---NOTES--- 1. The CHANNEL CALIBRATION shall consist only of adjusting excore channels to agree with incore detector measurements. 2. SR 3.0.4 is not applicable. ------ Perform CHANNEL CALIBRATION.	---NOTE--- Only required when THERMAL POWER is > 50% of RTP ------ [92] EFPDs
SR 3.3.1.7	Perform ANALOG CHANNEL OPERATIONAL TEST.	[92] days
SR 3.3.1.8	---NOTE--- This test shall include verification that interlocks P-6 and P-10 are in their required state for existing plant conditions. ------ Perform ANALOG CHANNEL OPERATIONAL TEST.	 [92] days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	[92] days
SR 3.3.1.10	-------------------NOTE------------------ This test shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	 [18] months
SR 3.3.1.11	-------------------NOTE------------------ The neutron detectors may be excluded from the CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	 [18] months
SR 3.3.1.12	-------------------NOTE------------------ This test shall include verification of Reactor Coolant System resistance temperature detector bypass loop flow rate. --- Perform CHANNEL CALIBRATION.	 [18] months
SR 3.3.1.13	Perform ANALOG CHANNEL OPERATIONAL TEST.	[18] months
SR 3.3.1.14	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	[18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.15	------------------NOTE------------------ Verification of setpoint is not required. -- Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	------NOTE----- Only required when not performed within previous 31 days --------------- Prior to reactor startup
SR 3.3.1.16	------------------NOTE------------------ Neutron detectors are exempt from response time testing. -- Demonstrate REACTOR TRIP SYSTEM RESPONSE TIME is within limits.	[18] months on a STAGGERED TEST BASIS

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

	FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1.	Manual Reactor Trip	1,2	2	B,V	SR 3.3.1.14	N/A
		$3^{(a)},4^{(a)},5^{(a)}$		C,V		
2.	Power Range Neutron Flux					
	a. High Setpoint	1,2	4	D,V	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [111.2]% of RATED THERMAL POWER (RTP)
	b. Low Setpoint	$1^{(b)}$,2	4	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [27.2]% of RTP
	c. f(ΔI)	1,2	4	E,V	SR 3.3.1.3 SR 3.3.1.6	Refer to Note 1 (Page 3.3-17)
3.	Power Range Neutron Flux Rate					
	a. High Positive Rate	1,2	4	E,V	SR 3.3.1.7 SR 3.3.1.11	≤ [6.8]% of RTP with time constant ≥ [2] sec
	b. High Negative Rate	1,2	4	E,V	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [6.8]% of RTP with time constant ≥ [2] sec
4.	Intermediate Range Neutron Flux	$1^{(b)},2^{(c)}$	2	F,G,V	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ [31]% of RTP
		$2^{(d)}$	2	H,V		
5.	Source Range Neutron Flux	$2^{(d)}$	2	I,J,V	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ [1.4E5] cps
		$3^{(a)},4^{(a)},5^{(a)}$	2	J,K,V		
		$3^{(e)},4^{(e)},5^{(e)}$	[2]	L,V		

(continued)

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

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

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

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

(e) With the Reactor Trip Breakers open. In this condition, source range function does not provide reactor trip but does provide [input to the Boron Dilution Protection System (LCO 3.3.5), and] indication.

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

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Overtemperature ΔT					
Two- and Four-Loop Plants	1,2	4	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3-19)
Three-Loop Plants	1,2	3	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3-19)
7. Overpower ΔT					
Two- and Four-Loop Plants	1,2	4	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 2 (Page 3.3-20)
Three-Loop Plants	1,2	3	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 2 (Page 3.3-20)
8. Pressurizer Pressure					
a. Low Setpoint					
Two- and Four-Loop Plants	$1^{(f)}$	4	M,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [1886] psig
Three-Loop Plants	$1^{(f)}$	3	M,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [1886] psig
b. High Setpoint					
Four-Loop Plants	1,2	4	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ [2396] psig
Two- and Three-Loop Plants	1,2	3	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ [2396] psig
9. Pressurizer Water Level--High	$1^{(f)}$	3	M,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ [93.8]%

(continued)

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

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

	FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
10.	Reactor Coolant Flow--Low					
	a. Single Loop	1(g)	3/loop	N,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [89.2]%
	b. Two Loops	1(h)	3/loop	M,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [89.2]%
11.	Reactor Coolant Pump (RCP) Breaker Open					
	a. Single Loop	1(g)	1/RCP	O,V	SR 3.3.1.14	N/A
	b. Two Loops	1(h)	1/RCP	M,V	SR 3.3.1.14	N/A
12.	Undervoltage Reactor Coolant Pumps	1(f)	[3]/bus	M,V	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ [4760] volts
13.	Underfrequency Reactor Coolant Pumps	1(f)	[3]/bus	M,V	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ [57.1] Hz
14.	Steam Generator (SG) Water Level--Low Low					
	Four-Loop Plants	1,2	4/SG	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [30.4]%
	Two-, Three-, and Four-Loop Plants	1,2	3/SG	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [30.4]%
15.	Steam Generator Water Level--Low	1,2	2/SG	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [30.4]%
	Coincident with					
	Steam Flow/Feedwater Flow Mismatch	1,2	2/SG	E,V	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ [42.5]% full steam flow at RTP

(continued)

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

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

(h) Above the P-7 (Low Power Reactor Trips Block) interlock and below the P-8 (Power Range Neutron Flux) interlock.

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

	FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
16.	Turbine Trip					
	a. Low Fluid Oil Pressure	1(i)	3	P,V	SR 3.3.1.10 SR 3.3.1.15	≥ [750] psig
	b. Turbine Stop Valve Closure	1(i)	4	P,V	SR 3.3.1.10 SR 3.3.1.15	≥ [1]% open
17.	Safety Injection Input from Engineered Safety Feature Actuation System	1,2	2 trains	Q,V	SR 3.3.1.14	N/A
18.	Reactor Trip System Interlocks					
	a. Intermediate Range Neutron Flux, P-6	2(d)	2	S,V	SR 3.3.1.11 SR 3.3.1.13	≥ [6E-11] amps
	b. Low Power Reactor Trips Block, P-7	1	1/train	T,V	SR 3.3.1.11 SR 3.3.1.13	N/A
	c. Power Range Neutron Flux, P-8	1	4	T,V	SR 3.3.1.11 SR 3.3.1.13	≤ [50.2]% of RTP
	d. Power Range Neutron Flux, P-9	1	4	T,V	SR 3.3.1.11 SR 3.3.1.13	≤ [52.2]% of RTP
	e. Power Range Neutron Flux, P-10	1,2	4	S,V	SR 3.3.1.11 SR 3.3.1.13	≥ [12.2]% of RTP and ≤ [7.8]% RTP
	f. Turbine Impulse Pressure, P-13	1	2	T,V	SR 3.3.1.11 SR 3.3.1.10 SR 3.3.1.13	≤ [12.2]% turbine power
19.	Reactor Trip Breakers(j)	1,2 3(a), 4(a), 5(a)	2 trains	R,V C,V	SR 3.3.1.4	N/A
20.	Reactor Trip Breaker (RTB) Undervoltage and Shunt Trip Mechanisms	1,2 3(a), 4(a), 5(a)	1/RTB	U,V C,V	SR 3.3.1.4	N/A
21.	Automatic Trip Logic	1,2 3(a), 4(a), 5(a)	2 trains	R,V C,V	SR 3.3.1.5	N/A

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

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

(i) Above the P-9 (Power Range Neutron Flux) interlock.

(j) Including any reactor trip bypass breakers that are racked-in and closed for bypassing a Reactor Trip Breaker.

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

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function ALLOWABLE VALUE shall not exceed the following trip setpoint by more than [3.8]% of ΔT span.

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \le \Delta T_0 \left\{K_1 - K_2 \frac{(1+\tau_4 s)}{(1+\tau_5 s)}\left[T \frac{1}{(1+\tau_6 s)} - T'\right] + K_3 (P - P') - f_1(\Delta I)\right\}$$

Where:
ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RATED THERMAL POWER, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the limiting T_{avg} at RTP, ≤ [588]°F.
P is the measured pressurizer pressure, psig.
P' is the nominal RCS operating pressure, ≤ [2235] psig.

K_1 ≤ [1.09]	K_2 ≥ [0.0138]/°F	K_3 = [0.000671] psig.
τ_1 ≥ [8] sec.	τ_2 ≤ [3] sec.	τ_3 ≤ [2] sec.
τ_4 ≥ [33] sec.	τ_5 ≤ [4] sec.	τ_6 ≤ [2] sec.

$f_1(\Delta I)$ = 1.26(35 + (q_t - q_b)) when $q_t - q_b$ ≤ -[35]
0% of RTP when -[35]% RTP < $q_t - q_b$ ≤ [7]
-1.05((q_t - q_b) - 7) when $q_t - q_b$ > [7]

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

Note 2: Overpower ΔT

The Overpower ΔT Function ALLOWABLE VALUE shall not exceed the following trip setpoint by more than [3]% of ΔT span.

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \le \Delta T_0 \left\{K_4 - K_5 \frac{\tau_7 s}{1+\tau_7 s}\left(\frac{1}{1+\tau_6 s}\right)T - K_6\left[T \frac{1}{1+\tau_6 s} - T''\right] - f_2(\Delta I)\right\}$$

Where:
ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RATED THERMAL POWER, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T'' is the nominal T_{avg} at RTP, ≤ [588]°F.

K_4 ≤ [1.09]	K_5 ≥ [0.02]/°F for increasing T_{avg} [0]/°F for decreasing T_{avg}	K_6 ≥ [0.00128]/°F when T > T'' [0]/°F when T ≤ T''
τ_1 ≥ [8] sec.	τ_2 ≤ [3] sec.	τ_3 ≤ [2] sec.
τ_6 ≤ [2] sec.	τ_7 ≥ [10] sec.	

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

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

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

APPLICABILITY: According to Table 3.3.2-1.

-------------------------NOTE-------------------------
For this LCO, each function shall be treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable for 1 or more functions.	A.1 Enter the Condition(s) referenced in Table 3.3.2-1 for each inoperable channel.	Immediately
B. One train inoperable.	B.1 Restore train to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Be in MODE 5.	84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------------------------	
C. One train inoperable.	C.1 Restore train to OPERABLE status.	6 hours
	<u>OR</u>	
	C.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	C.2.2 Be in MODE 5.	42 hours
	------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ----------------------------	
D. One channel inoperable.	D.1 Restore channel to OPERABLE status.	6 hours
	<u>OR</u>	
	D.2 Place channel in trip.	6 hours
	<u>OR</u>	
	D.3.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	D.3.2 Be in MODE 4.	18 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	-----------NOTE------------- One additional channel may be bypassed for up to 4 hours for surveillance testing. ---------------------------		
E. One channel inoperable.	E.1	Restore channel to OPERABLE status.	6 hours
	<u>OR</u>		
	E.2	Place channel in bypass.	6 hours
	<u>OR</u>		
	E.3.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	E.3.2	Be in MODE 4.	18 hours
F. One train inoperable.	F.1	Restore train to OPERABLE status.	4 hours
	<u>OR</u>		
	F.2	Place and maintain containment purge and exhaust valves in closed position.	4 hours
	<u>OR</u>		
	F.3.1	Be in MODE 3.	10 hours
	<u>AND</u>		
	F.3.2	Be in MODE 5.	40 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Two trains inoperable.	G.1	Restore 1 train to OPERABLE status.	1 hour
	OR		
	G.2	Place and maintain containment purge and exhaust valves in closed position.	1 hour
	OR		
	G.3.1	Be in MODE 3.	7 hours
	AND		
	G.3.2	Be in MODE 5.	37 hours
H. One train inoperable.	H.1	Restore train to OPERABLE status.	4 hours
	OR		
	H.2	Place and maintain containment purge and exhaust valves in closed position.	4 hours
	OR		
	H.3.1	Suspend CORE ALTERATIONS	4 hours
	AND		
	H.3.2	Suspend movement of fuel assemblies within containment.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
I. Two trains inoperable.	I.1	Restore 1 train to OPERABLE status.	1 hour
	OR		
	I.2	Place and maintain containment purge and exhaust valves in closed position.	1 hour
	OR		
	I.3.1	Suspend CORE ALTERATIONS.	1 hour
	AND		
	I.3.2	Suspend movement of fuel assemblies within containment.	1 hour
J. One channel or train inoperable.	J.1	Restore channel or train to OPERABLE status.	48 hours
	OR		
	J.2.1	Be in MODE 3.	54 hours
	AND		
	J.2.2	Be in MODE 4.	60 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ One train may be bypassed for up to 4 hours for surveillance provided the other train is OPERABLE. ------------------------------	
K. One train inoperable.	K.1 Restore train to OPERABLE status.	6 hours
	<u>OR</u>	
	K.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	K.2.2 Be in MODE 4.	18 hours
	------------NOTE------------ One train may be bypassed for up to 4 hours for surveillance provided the other train is OPERABLE. ------------------------------	
L. One train inoperable.	L.1 Restore train to OPERABLE status.	6 hours
	<u>OR</u>	
	L.2 Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	--------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ----------------------------	
M. One channel inoperable.	M.1 Restore channel to OPERABLE status.	6 hours
	OR	
	M.2 Place channel in trip.	6 hours
	OR	
	M.3 Be in MODE 3.	12 hours
N. One channel inoperable.	N.1 Restore channel to OPERABLE status.	48 hours
	OR	
	N.2 Be in MODE 3.	54 hours
	-----------NOTE-------------- One additional channel may be bypassed for up to 4 hours for surveillance testing. ----------------------------	
O. One channel inoperable.	O.1 Restore channel to OPERABLE status.	6 hours
	OR	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. (continued)	O.2 Place channel in bypass.	6 hours
	OR	
	O.3.1 Be in MODE 3.	6 hours
	AND	
	O.3.2 Be in MODE 5.	42 hours
P. One train inoperable.	P.1 Restore train to OPERABLE status.	7 days (168 hours)
	OR	
	P.2.1 Be in MODE 3.	174 hours
	AND	
	P.2.2 Be in MODE 5.	204 hours
Q. One train inoperable.	Q.1 Restore train to OPERABLE status.	7 days
	-------------NOTE------------ If auto-swapover to emergency filtration is inoperable, place Control Room Emergency Filtration System (CREFS) in emergency filtration mode. ----------------------------	
	OR	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q. (continued)	Q.2 Place 1 OPERABLE CREFS train in emergency filtration mode.	7 days
	OR	
	Q.3.1 Suspend CORE ALTERATIONS.	7 days
	AND	
	Q.3.2 Suspend positive reactivity additions.	7 days
	AND	
	Q.3.3 Suspend movement of irradiated fuel.	7 days
R. Two trains inoperable.	R.1 Restore 1 train to OPERABLE status.	Immediately
	-------------NOTE------------- If auto-swapover to emergency filtration is inoperable, place CREFS in emergency filtration mode. -----------------------------	
	OR	
	R.2 Place 1 OPERABLE CREFS train in emergency filtration mode.	Immediately
	OR	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
R. (continued)	R.3.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	R.3.2	Suspend positive reactivity additions.	Immediately
	AND		
	R.3.3	Suspend movement of irradiated fuel.	Immediately
S. One channel inoperable.	S.1	Verify interlock is required state for existing plant condition.	1 hour
	OR		
	S.2.1	Be in MODE 3.	7 hours
	AND		
	S.2.2	Be in MODE 4.	13 hours
T. One channel inoperable.	T.1	Verify interlock is in required state for existing plant condition.	1 hour
	OR		
	T.2	Be in MODE 3.	7 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
U. One or more channel(s) or train(s) inoperable.	U.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support channel(s) or trains(s) have been initiated.	1 hour
	<u>AND</u>		
	U.2	Verify that all required support and supported features associated with the other redundant channel(s) or train(s) are OPERABLE. If verification determines loss of functional capability, enter LCO 3.0.3 immediately unless the loss of functional capability is allowed in the support or supported feature LCO.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
------------------------NOTE------------------------ Refer to Table 3.3.2-1 to determine which SRs shall be performed for each ESF function. --		
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	----------------NOTE---------------- The continuity check may be excluded. ------------------------------------ Perform ACTUATION LOGIC TEST.	 31 days on a STAGGERED TEST BASIS
SR 3.3.2.3	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.4	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.5	Perform ANALOG CHANNEL OPERATIONAL TEST.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.6	Perform SLAVE RELAY TEST.	[92] days
SR 3.3.2.7	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	[92] days
SR 3.3.2.8	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	[18] months
SR 3.3.2.9	------NOTE------ This test shall include verification that the time constants are adjusted to the prescribed values. ------------------ Perform CHANNEL CALIBRATION.	[18] months
SR 3.3.2.10	------NOTE------ SR 3.0.4 is not applicable for the turbine-driven auxiliary feedwater pump. ------------------ Demonstrate ESFAS RESPONSE TIMES are within limit.	[18] months on a STAGGERED TEST BASIS
SR 3.3.2.11	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	Once per Reactor Trip Breaker cycle

Table 3.3.2-1 (page 1 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection					
a. Manual Initiation	1,2,3,4	2	B,U	SR 3.3.2.8	N/A
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
c. Containment Pressure--High 1	1,2,3	3	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [3.86] psig
d. Pressurizer Pressure--Low					
Four Loop Plants	1,2,3(a)	4	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [1839] psig
Two, Three, and Four Loop Plants	1,2,3(a)	3	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [1839] psig
e. Steam Line Pressure					
(1) Low Setpoint	1,2,3[(a)]	3/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635](b) psig
(2) High Differential Pressure Between Steam Lines	1,2,3	3/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [106] psig

(continued)

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

(b) Time constants used in the lead/lag controller are $t_1 \geq [50]$ seconds and $t_2 \leq [5]$ seconds.

Table 3.3.2-1 (page 2 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection (continued)					
f. High Steam Flow in Two Steam Lines	1,2,3(c)	2/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)
Coincident with T_{avg}--Low Low	1,2,3(c)	1/loop	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6]°F
or					
Coincident with Steam Line Pressure--Low	1,2,3(c)	1/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635](b)
2. Containment Spray					
a. Manual Initiation	1,2,3,4	2/train, 2 trains	B,U	SR 3.3.2.8	N/A
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
c. Containment Pressure					
High--3 Setpoint (Three and Four Loop Plants)	1,2,3	4	E,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig
High--3 Setpoint (Two Loop Plants)	1,2,3	[3] sets of [2]	E,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig
High High Setpoint	1,2,3	4	E,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	2	B,U	SR 3.3.2.8	N/A
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A

(continued)

(b) Time constants used in the lead/lag controller are $t_1 \geq$ [50] seconds and $t_2 \leq$ [5] seconds.

(c) Above the P-12 (T_{avg}--Low Low) interlock.

(d) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.

Table 3.3.2-1 (page 3 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. Containment Isolation (continued)					
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements.				
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	2/train, 2 trains	B,U	SR 3.3.2.9	N/A
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
(3) Containment Pressure					
High 3	1,2,3	4	E,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig
High High	1,2,3	4	E,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig
4. Containment Purge Isolation					
a. Manual Initiation	1,2,3,4 (e),(b)	2	F,G,U H,I,U	SR 3.3.2.9	N/A
b. Automatic Logic and Actuation Relays	1,2,3,4 (e), (f)	2 trains	F,G,U H,I,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
c. Safety Injection	Refer to function 1 (Safety Injection) for all initiating functions and other requirements.				
d. Phase A Isolation	Refer to function 3.a (Containment Isolation) for all initiating functions and other requirements.				
e. Containment Radiation	Refer to LCO 3.3.7 for all initiating functions and requirements.				

(continued)

(e) During movement of fuel assemblies within containment with irradiated fuel in containment and any containment purge or exhaust penetration open.

(f) During CORE ALTERATIONS with any purge or exhaust penetration open.

Table 3.3.2-1 (page 4 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Steam Line Isolation					
a. Manual Initiation	1,2,3	2	[illegible]	SR 3.3.2.8	N/A
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	K,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
c. Containment Pressure--High 2	1,2,3	[4]	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [6.61] psig
d. Steam Line Pressure					
(1) Low Setpoint	1,2,3$^{(a)}$	3/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635]$^{(b)}$ psig
(2) Steam Line Pressure-Negative Rate--High Setpoint	3$^{(g)}$	3/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [121.6$^{(h)}$] psi/sec
e. High Steam Flow in Two Steam Lines	1,2,3$^{(c)}$	2/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)
Coincident with T_{avg}--Low Low	1,2,3$^{(c)}$	1/loop	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6]°F
or					
Coincident with Steam Line Pressure Low	1,2,3$^{(c)}$	1/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635]$^{(b)}$ psig

(continued)

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

(b) Time constants used in the lead/lag controller are $t_1 \geq$ [50] seconds and $t_2 \leq$ [5] seconds.

(c) Above the P-12 (T_{avg}--Low Low) interlock.

(d) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]%, ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.

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

(h) Time constant utilized in the rate/lag controller is ≤ [50] seconds.

Table 3.3.2-1 (page 4 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Steam Line Isolation (continued)					
f. High Steam Flow	1,2,3	2/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [25]% of full steam flow at no load steam pressure
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements				
and					
Coincident with T_{avg}--Low Low	1,2,3[(c)]	1/loop	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6)]°F
g. High High Steam Flow in Two Steam Lines	1,2,3	2/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [130]% of full steam flow at full load steam pressure
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements				
h. High High Steam Flow in Two Steam Lines	1,2,3[(c)]	2/steam line	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)
Coincident with T_{avg}--Low Low	1,2,3[(c)]	1/loop	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6]°F
6. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	1,2	2 trains	L,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
b. Steam Generator (SG) Water Level--High High (P-14)					
Two, Three, and Four Loop Plants	1,2	3/SG	M,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [84.2]%

(continued)

(c) Above the P-12 (T_{avg}--Low Low) interlock.

(d) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.

Table 3.3.2-1 (page 6 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Turbine Trip and Feedwater Isolation (continued)					
Four Loop Plants	1,2	4/SG	M,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [84.2]%
c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements.				
7. Auxiliary Feedwater					
a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1,2,3	2 trains	K,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)	1,2,3	2 trains	K,U	SR 3.3.2.2 SR 3.3.2.10	N/A
c. Steam Generator (SG) Water Level--Low Low					
Two, Three, and Four Loop Plants	1,2,3	3/SG	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [30.4]%
Four Loop Plants	1,2,3	4/SG	D,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [30.4]%
d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements.				
e. Loss of Offsite Power	1,2,3	[3]/bus	,U	SR 3.3.2.8 SR 3.3.2.9 SR 3.3.2.7	≥ [ ] V
f. Undervoltage Reactor Coolant Pump	1,2	[3]/pump	M,U	SR 3.3.2.8 SR 3.3.2.9 SR 3.3.2.7	≥ [70]% bus voltage
g. Trip of All Main Feedwater Pumps	1,2	[2]/pump	N,U	SR 3.3.2.8 SR 3.3.2.9	≥ [ ] psig
h. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure--Low	1,2,3	[2]	J,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [20.53] [psia]

(continued)

Table 3.3.2-1 (page 7 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Automatic Switchover To Containment Sump					
a. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.10	N/A
b. Refueling Water Storage Tank (RWST) Level--Low Low	1,2,3,4	4	O,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [15]% and ≤ [ ]%
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements.				
c. RWST Level--Low Low	1,2,3,4	4	O,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.1.10	≥ [15]%
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiating functions and requirements.				
and					
Coincident with Containment Sump Level--High	1,2,3,4	4	O,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [30] in above EL [703] ft
9. Control Room Emergency Ventilation					
a. Manual Initiation	1,2,3,4, (i)	2	P,U Q,R,U	SR 3.3.2.8	N/A
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4, (i)	2 trains	P,U Q,R,U	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.6	N/A
c. Phase A Isolation	Refer to Function 3.a (Phase A Isolation) for all initiating functions and requirements.				
d. Control Room Atmosphere and Air Intake Radiation	Refer to LCO 3.3.7 for all initiating functions and requirements.				

(continued)

(i) During CORE ALTERATIONS and when moving irradiated fuel.

Table 3.3.2-1 (page 8 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
10. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	1/train, 2 trains	J,U	SR 3.3.2.11	N/A
b. Pressurizer Pressure, P-11	1,2,3	3	S,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤ [1996] psig
c. T_{avg}--Low Low, P-12	1,2,3	3, 1/loop	S,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≥ [550.6]°F
d. Steam Generator (SG) Water Level--High High, P-14	1,2	[3]/SG	T,U	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤ [84.2]%

3.3 INSTRUMENTATION

3.3.3 Post-Accident Monitoring (PAM) Instrumentation

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

APPLICABILITY: MODES 1, 2, and 3.

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

1. LCO 3.0.4 not applicable.
2. For this LCO, each function is treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required channel in 1 or more functions inoperable.	A.1	Restore channel to OPERABLE status.	30 days
B. Two required channels in 1 or more functions inoperable.	B.1	Restore 1 channel to OPERABLE status.	7 days
C. Required Actions and associated Completion Times of Condition A or B not met.	C.1	Enter the Condition(s) referenced in Table 3.3.3-1 for each inoperable channel.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action C.1 and referenced in Table 3.3.3-1.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 4.	12 hours
E. As required by Required Action C.1 and referenced in Table 3.3.3-1.	E.1	Initiate actions in accordance with Specification 5.9.2.c.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
-----NOTE----- These SRs apply to each PAM instrumentation function in Table 3.3.3-1.	
SR 3.3.3.1 Perform CHANNEL CHECK.	31 days
SR 3.3.3.2 Perform CHANNEL CALIBRATION.	[18] months

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

	FUNCTION	REQUIRED CHANNELS	CONDITIONS
1.	Power Range Neutron Flux	2	D
2.	Source Range Neutron Flux	2	D
3.	Reactor Coolant System Hot Leg Temperature	2/loop	D
4.	Reactor Coolant System Cold Leg Temperature	2/loop	D
5.	Reactor Coolant System Pressure (Wide Range)	2	D
6.	Reactor Vessel Water Level	2	[E]
7.	Containment Sump Water Level (Wide Range)	2	D
8.	Containment Pressure (Wide Range)	2	D
9.	Containment Isolation Valve Position	1/valve[(a)]	D
10.	Containment Area Radiation (High Range)	2	[E]
11.	Containment Hydrogen Concentration	2	D
12.	Pressurizer Level	2	D
13.	Steam Generator Water Level	2/steam generator	D
14.	Condensate Storage Tank Level	2	D
15.	Core Exit Temperature--Quadrant [1]	2 independent sets of 2	D
16.	Core Exit Temperature--Quadrant [2]	2 independent sets of 2	D
17.	Core Exit Temperature--Quadrant [3]	2 independent sets of 2	D
18.	Core Exit Temperature--Quadrant [4]	2 independent sets of 2	D
19.	Auxiliary Feedwater Flow	2	D

NOTE: Table 3.3.3-1 shall be amended for each facility as necessary to list:

(1) All Regulatory Guide 1.97, Type A instruments, and

(2) All Regulatory Guide 1.97, Category 1, instruments specified in the plant's Regulatory Guide 1.97, Safety Evaluation Report.

(a) Not required for isolation valves that are closed and deactivated.

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- For this LCO, each [division] is treated as an independent entity with an independent Completion Time. ---------------------- One or more [divisions] inoperable.	A.1 Restore [division(s)] to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

NOTE: Bases shall describe the required instrumentation and controls for the Remote Shutdown System in accordance with the requirements of GDC 19 and 10 CFR 50, Appendix R.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[SR 3.3.4.1	Perform CHANNEL CHECK for each required Remote Shutdown System instrumentation channel.	31 days]
SR 3.3.4.2	Verify each required control circuit and transfer switch is capable of performing its intended function.	[18] months
SR 3.3.4.3	Perform CHANNEL CALIBRATION for each required Remote Shutdown System instrumentation channel.	[18] months
[SR 3.3.4.4	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST of the reactor trip breaker open/closed indication.	18 months]

3.3 INSTRUMENTATION

3.3.5 Boron Dilution Protection System (BDPS)

LCO 3.3.5 Two trains of the BDPS shall be OPERABLE.

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

-----------------------------------NOTE-----------------------------------
The boron dilution flux-doubling signal may be blocked in MODES 2 and 3 during reactor startup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable.	A.1 Restore train to OPERABLE status.	72 hours
B. Two trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Suspend operations involving positive reactivity additions. AND B.2 Restore 1 train to OPERABLE status. OR B.3.1 Perform Required Action A.2 of LCO 3.9.2 (secure unborated water source isolation valves). AND	Immediately 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.3.2	Perform SR 3.1.1.1 (SHUTDOWN MARGIN verification).	1 hour <u>AND</u> Once per 12 hours
C. One train inoperable.	C.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support train have been initiated.	1 hour
	<u>AND</u>		
	C.2	Verify that all required support and supported features associated with the other redundant train are OPERABLE. If verification determines loss of functional capability, enter LCO 3.0.3 immediately unless the loss of functional capability is allowed in the support or supported feature LCO.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform ANALOG CHANNEL OPERATIONAL TEST.	[92] days
SR 3.3.5.2	Perform CHANNEL CALIBRATION.	[18] months

3.3 INSTRUMENTATION

3.3.6 Miscellaneous Safeguards Actuations

LCO 3.3.6 The instrumentation for each function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

-----------------------------NOTE-----------------------------
For this LCO, each function shall be treated as an independent entity with an independent Completion time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable for 1 or more functions.	A.1 Enter the Condition(s) referenced in Table 3.3.6-1 for each inoperable channel.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ----------------------------	
B. One channel inoperable.	B.1 Restore channel to OPERABLE status.	1 hour
	<u>OR</u>	
	B.2.1 Place channel in trip.	1 hour
	<u>AND</u>	
	B.2.2 Restore channel to OPERABLE status.	Prior to the next TRIP ACTUATING DEVICE OPERATIONAL TEST
C. Two or more channels inoperable.	C.1 Restore 1 channel to OPERABLE status.	1 hour
D. Required Actions and associated Completion Times of Condition B or C not met.	D.1 Declare the associated diesel generator and other supported systems inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. One train inoperable.	E.1	Restore train to OPERABLE status.	7 days (168 hours)
	OR		
	E.2.1	Be in MODE 3.	174 hours
	AND		
	E.2.2	Be in MODE 5.	204 hours
F. One train inoperable.	F.1	Restore train to OPERABLE status.	7 days
	OR		
	F.2	Place 1 OPERABLE Fuel Building Air Cleanup System in operation.	7 days
	OR		
	F.3	Suspend movement of irradiated fuel in the fuel building.	7 days
G. Two trains inoperable.	G.1	Restore 1 train to OPERABLE status.	Immediately
	OR		
	G.2	Suspend movement of irradiated fuel in the fuel building.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. One channel or train inoperable.	H.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support channel(s) or trains(s) have been initiated.	1 hour
	<u>AND</u>		
	H.2	Verify that all required support and supported features associated with the other redundant channel(s) or train(s) are OPERABLE. If verification determines loss of functional capability, enter LCO 3.0.3 immediately unless the loss of functional capability is allowed in the support or supported feature LCO.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
----------NOTE---------- Refer to Table 3.3.6-1 to determine which SRs shall be performed for each safeguards function.		
[SR 3.3.6.1	Perform CHANNEL CHECK.	12 hours]
SR 3.3.6.2	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST.	[31] days
SR 3.3.6.3	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
[SR 3.3.6.4	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS]
[SR 3.3.6.5	Perform SLAVE RELAY TEST.	92 days]
SR 3.3.6.6	----------NOTE---------- This test shall include verification that the time constants are adjusted to the prescribed values. ------------------------------ Perform CHANNEL CALIBRATION.	[18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.7	Perform TRIP ACTUATION DEVICE OPERATIONAL TEST.	[18] months

Table 3.3.6-1 (page 1 of 1)
Miscellaneous Safeguards Actuations

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Emergency Diesel Generator Loss of Power Start					
a. Loss of Voltage in Single Bus	1,2,3,4, $5^{(a)}$,$6^{(a)}$	[4]/bus	B,C,D,H	[SR 3.3.6.1] SR 3.3.6.2 SR 3.3.6.6	± [ ] volts with a time delay [0.2.7.5] ± [ ] seconds
b. Degraded Voltage in Single Bus	1,2,3,4 $5^{(a)}$,$6^{(a)}$	[4]/bus	B,C,D,H	[SR 3.3.6.1] SR 3.3.6.2 SR 3.3.6.6	± [ ] volts with a time delay [3.3] ± [ ] seconds
c. Safety Injection	Refer to Function 1 (Safety Injection) of LCO 3.3.2, "ESFAS instrumentation," for all initiating functions and requirements.				
2. Fuel Building Air Cleanup Actuation System					
a. Manual Initiation	[1,2,3,4], (b)	1/train 2 trains	E,H, F,G,H	SR 3.3.6.7	N/A
b. Automatic Actuation Logic and Actuation Relays	[1,2,3,4], (b)	2 trains	F,G,H	SR 3.3.6.3 SR 3.3.6.4 SR 3.3.6.5	
[c. Safety Injection	Refer to Function 1 (Safety Injection) of LCO 3.3.2, "ESFAS Instrumentation," for all initiating functions and other requirements.]				
d. Fuel Building Atmospheric Radiation	Refer to LCO 3.3.7, "Radiation Monitoring Instrumentation," for all initiating functions and requirements.				

(a) When associated diesel generator is required to be OPERABLE per LCO 3.8.2, "AC — Shutdown."

(b) During movement of irradiated fuel in the fuel building.

3.3 INSTRUMENTATION

3.3.7 Radiation Monitoring Instrumentation

LCO 3.3.7 The radiation monitoring instrumentation for each function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1.

--------------------------NOTE--------------------------
For this LCO, each function shall be treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable for 1 or more functions.	A.1 Enter the Condition(s) referenced in Table 3.3.7-1 for each inoperable channel.	Immediately
B. One channel inoperable.	B.1 Restore channel to OPERABLE status.	1 hour
	OR	
	B.2 Place and maintain containment purge and exhaust valves in closed position.	1 hour
	OR	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.3.1	Be in MODE 3.	7 hours
	<u>AND</u>		
	B.3.2	Be in MODE 5.	37 hours
C. One channel inoperable.	C.1	Restore channel to OPERABLE status.	Immediately
	<u>OR</u>		
	C.2	Place and maintain containment purge and exhaust valves in closed position.	Immediately
	<u>OR</u>		
	C.3.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	C.3.2	Suspend movement of fuel assemblies within containment.	Immediately
D. One channel inoperable.	D.1	Restore channel to OPERABLE status.	7 days (168 hours)
	<u>OR</u>		
	D.2.1	Be in MODE 3.	174 hours
	<u>AND</u>		
	D.2.2	Be in MODE 5.	204 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. One channel inoperable.	E.1	Restore channel to OPERABLE status. ---------NOTE-------- If auto-swapover emergency filtration is inoperable, place Control Room Emergency Filtration System (CREFS) in emergency filtration mode. ---------------------	7 days
	<u>OR</u>		
	E.2	Place 1 OPERABLE CREFS train in emergency filtration mode.	7 days
	<u>OR</u>		
	E.3.1	Suspend CORE ALTERATIONS.	7 days
	<u>AND</u>		
	E.3.2	Suspend positive reactivity additions.	7 days
	<u>AND</u>		
	E.3.3	Suspend movement of irradiated fuel.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. Two channels inoperable.	F.1	Restore 1 channel to OPERABLE status. ---------NOTE--------- If auto-swapover emergency filtration is inoperable, place CREFS in emergency filtration mode. --------------------	Immediately
	OR		
	F.2	Place 1 OPERABLE CREFS train in emergency filtration mode.	Immediately
	OR		
	F.3.1	Suspend CORE ALTERATIONS.	Immediately
	F.3.2	Suspend positive reactivity additions.	Immediately
	AND		
	F.3.3	Suspend movement of irradiated fuel.	Immediately
	AND		

(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. One channel inoperable.	G.1	Restore channel to OPERABLE status.	7 days (168 hours)
	OR		
	G.2.1	Be in MODE 3.	174 hours
	AND		
	G.2.2	Be in MODE 5.	204 hours
H. One channel inoperable.	H.1	Restore channel to OPERABLE status.	7 days
	AND		
	H.2	Place Fuel Building Air Cleanup System train in operation.	7 days
	OR		
	H.3	Suspend movement of irradiated fuel in the fuel building.	7 days
I. Two channels inoperable.	I.1	Restore 1 channel to OPERABLE status.	Immediately
	OR		
	I.2	Suspend movement of irradiated fuel in the fuel building.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. One channel inoperable.	J.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support channel(s) have been initiated.	1 hour
	<u>AND</u>		
	J.2	Verify that all required support and supported features associated with the other redundant channel(s) are OPERABLE. If verification determines loss of functional capability, enter LCO 3.0.3 immediately unless the loss of functional capability is allowed in the support or supported feature LCO.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
----------------------------------NOTE---------------------------------- Refer to Table 3.3.7-1 to determine which SRs shall be performed for each radiation monitoring function. --	
SR 3.3.7.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2 Perform ANALOG CHANNEL OPERATIONAL TEST.	31 days
SR 3.3.7.3 Perform CHANNEL CALIBRATION.	[18] months

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Table 3.3.7-1 (page 1 of 2)
Radiation Monitoring Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Containment Purge Isolation--Radiation High					
a. Gaseous	1,2,3,4	[1]	B,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2 × bkgnd]
	$5^{(a)},6^{(a)}$		C,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
b. Particulate	1,2,3,4	[1]	B,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2 × bkgnd]
	$5^{(a)}, 6^{(a)}$		C,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
c. Iodine	1,2,3,4	[1]	B,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2 × bkgnd]
	$5^{(a)},6^{(a)}$		C,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
d. Area Radiation	1,2,3,4	[1]	B,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2 × bkgnd]
	$5^{(a)},6^{(a)}$		C,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
2. Control Room Emergency Ventilation--Radiation High					
a. Control Room Atmosphere	1,2,3,4	[2]	D,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2] mR/hr
	(b)		E,F,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	

(continued)

(a) During CORE ALTERATIONS and during movement of fuel assemblies within containment with irradiated fuel in containment.

(b) During CORE ALTERATIONS and during movement of irradiated fuel or loads over irradiated fuel.

Table 3.3.7-1 (page 2 of 2)
Radiation Monitoring Instrumentation

FUNCTION	APPLICABLE MODES	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Control Room Emergency Ventilation--Radiation High (continued)					
b. Control Room Air Intakes	1,2,3,4	[2]	D,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2] mR/hr
	[(b)]		E,F,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
3. Fuel Building Air Cleanup System--Radiation High					
a. Gaseous	1,2,3,4	[2]	G,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2] mR/hr
	[(c)]		H,I,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	
b. Particulate	1,2,3,4	[2]	G,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	≤ [2] mR/hr
	[(c)]		H,I,J	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.3	

(b) During CORE ALTERATIONS and during movement of irradiated fuel or loads over irradiated fuel.

(c) During movement of irradiated fuel or loads of irradiated fuel in the fuel building.

3.4 REACTOR COOLANT SYSTEM (RCS)

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

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

a. Pressurizer pressure ≥ [2200] psig,

b. RCS average temperature ≤ [581]°F, and

c. RCS total flow rate ≥ [ ] gpm.

APPLICABILITY: MODE 1.

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

a. A THERMAL POWER ramp in excess of [5]% of RATED THERMAL POWER (RTP) per minute, or

b. A THERMAL POWER step in excess of [10]% of RTP.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure ≥ [2200] psig.	12 hours
SR 3.4.1.2	Verify RCS average temperature ≤ [581]°F.	12 hours
SR 3.4.1.3	Verify RCS total flow rate ≥ [ ] gpm.	12 hours
SR 3.4.1.4	-------------------NOTE------------------- SR 3.0.4 is not applicable. This SR shall be performed within 24 hours after reaching 90% of RTP. -- Demonstrate, by precision heat balance, that RCS total flow rate is ≥ [ ] gpm.	[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 shall be ≥ [541]°F.

APPLICABILITY: MODE 1 [with 1 or more RCS loop average temperatures < [551]°F],
MODE 2 with [1 or more RCS loop average temperatures < [551]°F] and $K_{eff} \geq 1.0$.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more RCS loop average temperatures not within limits.	A.1	Restore RCS loop average temperature(s) to within limit.	15 minutes
	<u>OR</u>		
	A.2	Be in MODE 3.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify RCS loop average temperature in each loop ≥ [541]°F.	Within 15 minutes prior to achieving criticality AND -----NOTE----- Only required if [T_{avg} - T_{ref} deviation] alarm not reset -------------- 30 minutes

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.3 The combination of RCS pressure, RCS temperature, and RCS heatup and cooldown rates shall be maintained within the limits specified in Figure 3.4.3-1 and Figure 3.4.3-2.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Required Action A.1 and Required Action A.2 must be completed whenever this Condition is entered. --------------------- Requirements of LCO not met.	A.1 Restore parameter(s) to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Actions and associated Completion Times not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5 with RCS pressure < [500] psig.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.3.1	--------------------NOTE------------------- Only required during RCS heatup and cooldown operations and inservice leak and hydrostatic testing. --- Verify the combination of RCS pressure and temperature and the heatup and cooldown rates within limits.	 30 minutes

Curves include allowances of [ ] °F and [ ] psi for possible instrument error.

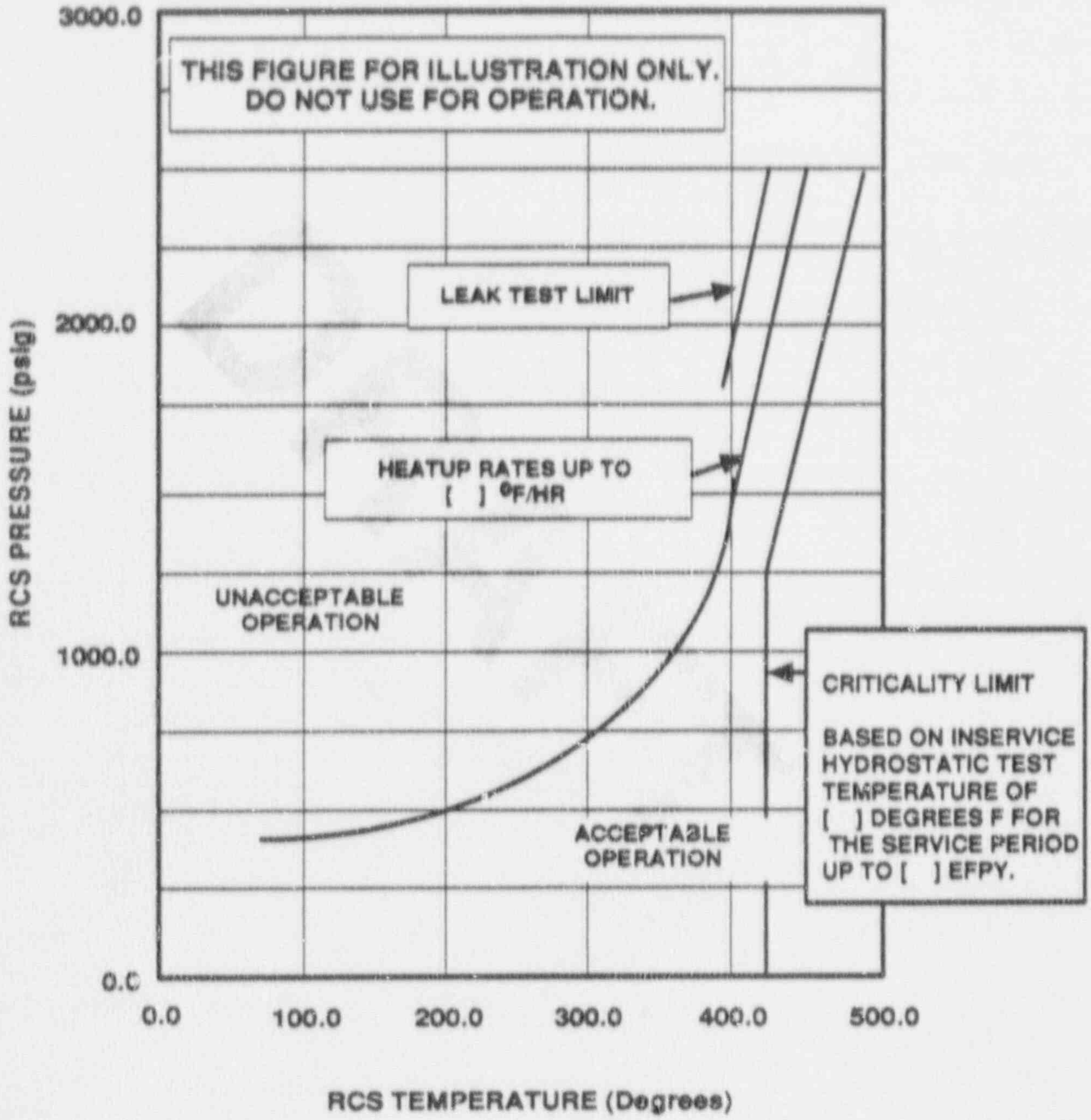

Figure 3.4.3-1
RCS Heatup Limitations
Applicable Up to [ ] EFPY

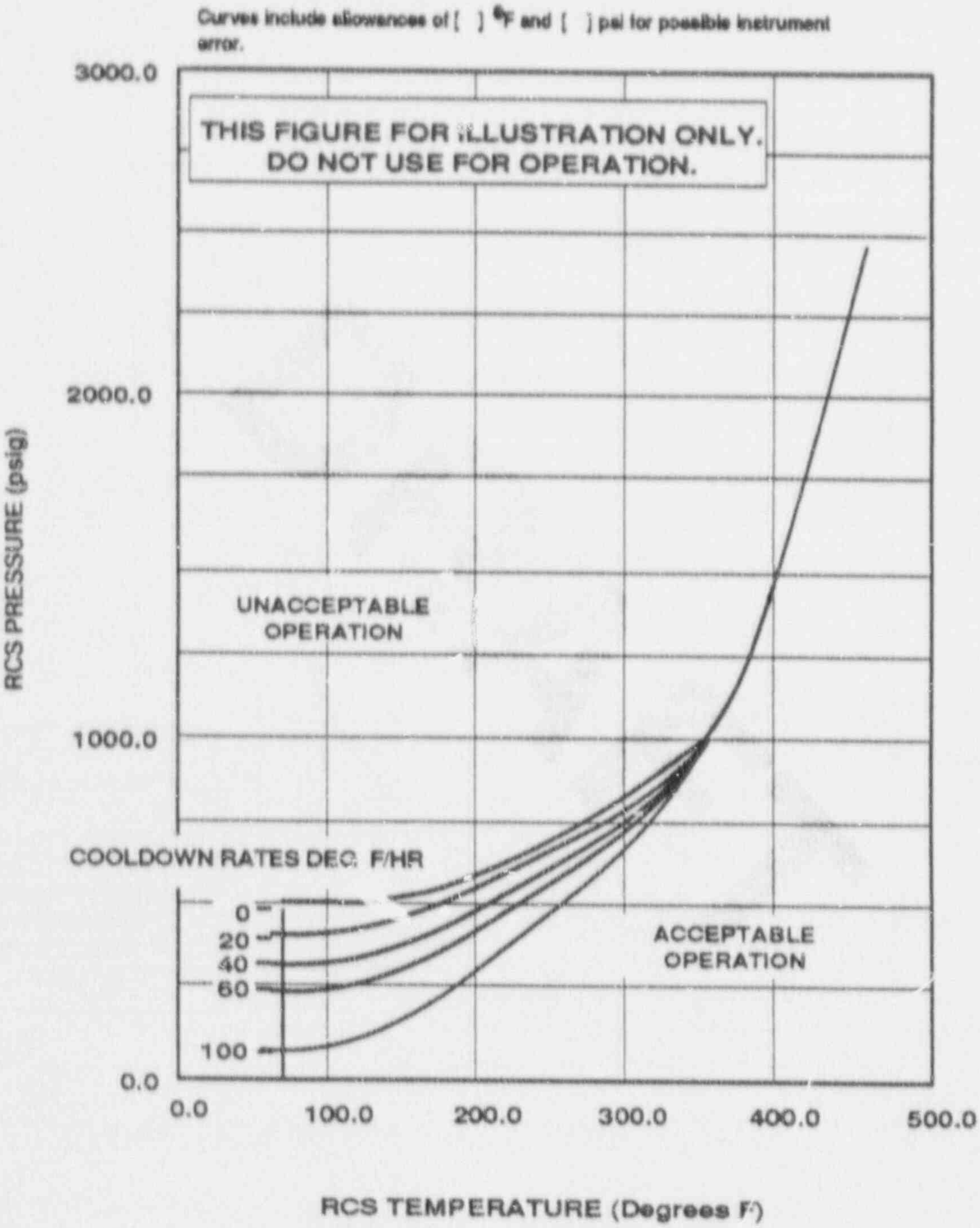

Figure 3.4.3-2
RCS Cooldown Limitations
Applicable Up to [ ] EFPY

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops—MODES 1 & 2

LCO 3.4.4 [Four] RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more RCS loops not OPERABLE or not in operation.	A.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify each RCS loop is OPERABLE, in operation, and circulating reactor coolant.	12 hours
SR 3.4.4.2	Demonstrate steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program (Specification 5.7.4.n).	In accordance with the Steam Generator Tube Surveillance Program (Specification 5.7.4.n)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops—MODE 3

LCO 3.4.5 [Two] RCS loops shall be OPERABLE, and either:

a. [Two] RCS loops shall be in operation when the reactor trip breakers are closed; or

b. One RCS loop shall be in operation when the reactor trip breakers are open.

-----------------------------NOTE-----------------------------

All reactor coolant pumps may be de-energized for ≤ 1 hour per 8-hour period provided:

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

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

APPLICABILITY: MODE 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required RCS loop inoperable.	A.1	Restore required 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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
[C. Only 1 RCS loop OPERABLE and in operation, and reactor trip breakers closed.	C.1	Restore 1 RCS loop to operation.	1 hour
	OR		
	C.2	Open reactor trip breakers.]	1 hour]
D. No RCS loop OPERABLE.	D.1	Open reactor trip breakers.	Immediately
OR	AND		
No RCS loop OPERABLE and in operation.	D.2	Suspend all operations involving a reduction in RCS boron concentration.	Immediately
	AND		
	D.3	Initiate action to restore 1 RCS loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required number of RCS loops are OPERABLE, in operation, and circulating reactor coolant.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify secondary-side water level of [2] steam generators ≥ [17]%.	12 hours
SR 3.4.5.3	-------------------NOTE------------------- Only required if reactor trip breakers are open. -- Verify correct breaker alignment and indicated power available to the required loop that is not in operation.	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 residual heat removal (RHR) loops shall be OPERABLE, and at least 1 loop shall be in operation.

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

1. All reactor coolant pumps (RCPs) and RHR pumps may be de-energized for ≤ 1 hour per 8-hour period provided.

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

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

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

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Only 1 RCS loop OPERABLE and in operation. AND No RHR loops OPERABLE.	A.1 Initiate action to return a second loop to OPERABLE status.	15 minutes

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Only 1 RHR loop OPERABLE and in operation. AND No RCS loops OPERABLE.	B.1	Restore a second loop to OPERABLE status.	1 hour
	OR		
	B.2	Be in MODE 5.	25 hours
C. No RCS or RHR loop OPERABLE. OR No RCS or RHR loop OPERABLE and in operation.	C.1	Suspend all operations involving a reduction in RCS boron concentration.	Immediately
	AND		
	C.2	Initiate action to restore 1 loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify at least 1 RHR or RCS loop OPERABLE, in operation, and circulating reactor coolant.	12 hours
SR 3.4.6.2	Verify secondary-side water level of required SGs ≥ [17]%.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.6.3	Verify correct breaker alignment and indicated power available to the required loop that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops—MODE 5, Loops Filled

LCO 3.4.7 One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or

b. The secondary-side water level of at least [2] steam generators (SGs) shall be ≥ [17]%.

---NOTES---

1. The RHR pump of the loop in operation may be de-energized for ≤ 1 hour per 8-hour period provided:

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

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

2. One RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started with 1 or more RCS cold leg temperatures ≤ [275]°F unless the secondary-side water temperature of each SG is ≤ [ ]°F above each of the RCS cold leg temperatures.

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least 1 RCS loop is OPERABLE and in operation.

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Only 1 RHR loop OPERABLE and in operation. AND Less than [2] SGs with secondary-side water levels within limit.	A.1	Initiate action to restore a second RHR loop to OPERABLE status.	15 minutes
	OR		
	A.2	Initiate action to restore SG secondary-side water levels to within limits.	15 minutes
B. No RHR loop OPERABLE. OR No RHR loop OPERABLE and in operation.	B.1	Suspend all operations involving a reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore 1 RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify at least 1 RHR loop OPERABLE, in operation, and circulating reactor coolant.	12 hours
SR 3.4.7.2	Verify SG secondary-side water levels ≥ [17]% in at least [2] SGs.	-----NOTE----- Only required if fewer than 2 RHR loops are OPERABLE -------------- 12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required RHR loop that is not in operation.	-----NOTE----- Only required if secondary-side water level is ≤ [17]% in more than [2] SGs -------------- 7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops—MODE 5, Loops Not Filled

LCO 3.4.8 Two residual heat removal (RHR) loops shall be OPERABLE and at least 1 RHR loop shall be in operation.

---NOTES---

1. All RHR pumps may be de-energized for ≤ 15 minutes when switching from 1 loop to another provided:

   a. The maximum RCS temperature is ≤ [160]°F,

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

   c. No draining operations to further reduce the RCS water volume are permitted.

2. One RHR loop may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RHR loop inoperable.	A.1	Initiate action to restore RHR loop to OPERABLE status.	15 minutes

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. No RHR loop OPERABLE. OR No RHR loop OPERABLE and in operation.	B.1	Suspend all operations involving reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore 1 RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify at least 1 RHR loop OPERABLE, in operation and circulating reactor coolant.	12 hours
SR 3.4.8.2	Verify correct breaker alignment and indicated power available to the required RHR loop that is not in operation.	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 ≤ [ ]% of span, equivalent to ≤ [1656] cubic feet; and

b. At least 2 groups of pressurizer heaters OPERABLE with the capacity of each group ≥ [150] kW and capable of being powered from an emergency power source.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Be in MODE 3 with reactor trip breakers open. AND A.2 Be in MODE 4.	6 hours 12 hours
B. One required group of pressurizer heaters inoperable.	B.1 Restore required group of pressurizer heaters to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level ≤ [ ]% of span.	12 hours
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters ≥ [150] kW.	92 days
[SR 3.4.9.3	Demonstrate 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 [Three] pressurizer safety valves shall be OPERABLE with lift settings ≥ [2460] and ≤ [2510] psig.

--------------------------NOTE--------------------------
LCO 3.0.4 and SR 3.0.4 are not applicable 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 [54] hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with any RCS cold leg temperature > [275]°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. OR More than 1 pressurizer safety valve inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with all RCS cold leg temperatures ≤ [275]°F.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Demonstrate each pressurizer safety valve OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power-Operated Relief Valves (PORVs)

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

APPLICABILITY: MODES 1, 2, and 3.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORVs inoperable and capable of being manually cycled.	A.1 Restore PORV(s) to OPERABLE status. OR A.2 Close and maintain power to associated block valve(s).	1 hour 1 hour
B. One [or 2] PORV[(s)] inoperable and not capable of being manually cycled.	B.1 Restore PORV[(s)] to OPERABLE status. OR B.2.1 Close associated block valve[(s)]. AND B.2.2 Remove power from associated block valve[(s)]. AND	1 hour 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2.3	Restore PORV[(s)] to OPERABLE status.	73 hours
	AND		
	B.2.4	Restore power to associated block valve[(s)].	73 hours
	AND		
	B.2.5	Open associated block valve[(s)].	73 hours
C. One block valve inoperable.	C.1	Restore block valve to OPERABLE status.	1 hour
	OR		
	C.2.1	Place associated PORV in manual control.	1 hour
	AND		
	C.2.2	Restore block valve and PORV to OPERABLE status.	73 hours
D. Required Actions and associated Completion Times of Conditions A, B, or C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 4.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. [Two or Three] PORVs inoperable and not capable of being manually cycled.	E.1	Restore at least 1 PORV to OPERABLE status.	1 hour
	OR		
	E.2.1	Close associated block valves.	1 hour
	AND		
	E.2.2	Remove power from associated block valves.	1 hour
	AND		
	E.2.3	Be in MODE 3.	7 hours
	AND		
	E.2.4	Be in MODE 4.	13 hours
F. More than 1 block valve inoperable.	F.1	Restore block valves to OPERABLE status.	1 hour
	OR		
	F.2.1	Place associated PORVs in manual control.	1 hour
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. (continued)	F.2.2 Restore at least 1 block valve to OPERABLE status [if 3 block valves are inoperable]. AND F.2.3 Restore remaining block valve[(s)] to OPERABLE status.	2 hours 73 hours
G. Required Actions and associated Completion Times of Condition E or F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	7 hours 13 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	--------------------NOTE-------------------- Surveillance not required with block valve closed in accordance with the Required Actions of this Specification. -- Perform a complete cycle of each block valve.	92 days
SR 3.4.11.2	Perform a CHANNEL CALIBRATION for each PORV.	[18] months
SR 3.4.11.3	Perform a complete cycle of each PORV in MODE 3 or 4.	[18] months
[SR 3.4.11.4	Perform a complete cycle of each solenoid air control valve and check valve on the air accumulators in PORV control systems.	[18] months]
[SR 3.4.11.5	Demonstrate emergency power supply for PORVs and block valves is OPERABLE.	[18] months]

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12 An LTOP System shall be OPERABLE with only [1] [high pressure injection (HPI)] pump [and 1 charging pump] OPERABLE and the accumulators isolated; and either a or b below:

a. Two RCS relief valves, as follows:

   1. Two power-operated relief valves (PORVs) with lift settings within the limits specified in Figure 3.4.12-1, or

   [2. Two residual heat removal (RHR) suction relief valves with setpoints ≥ [436.5] and ≤ [463.5] psig, or]

   [3. One PORV with a lift setting, within the limits specified in Figure 3.4.12-1 and 1 RHR suction relief valve with a setpoint ≥ [436.5] and ≤ [463.5] psig.]

b. The RCS depressurized and an RCS vent of ≥ [2.07] square inches.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ [275]°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

---------------------------NOTE---------------------------
Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the pressure and temperature limit curves provided in LCO 3.4.3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. More than [1] [HPI] pump OPERABLE.	A.1	Initiate action to ensure only [1] [HPI] pump OPERABLE.	Immediately
[B. More than [1] charging pump OPERABLE.	B.1	Initiate action to ensure only [1] charging pump OPERABLE.	Immediately]
C. An accumulator not isolated when the accumulator pressure is ≥ the maximum RCS pressure for existing cold leg temperature allowed in LCO 3.4.3.	C.1	Isolate affected accumulator.	1 hour
D. Required Action C.1 not met within the required Completion Time.	D.1	Increase RCS cold leg temperature above [175]°F.	12 hours
	<u>OR</u>		
	D.2	Depressurize affected accumulator to < the maximum RCS pressure for existing cold leg temperature allowed in LCO 3.4.3.	12 hours
E. In MODE 4, 1 RCS relief valve inoperable.	E.1	Restore 2 RCS relief valves to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. In MODE 5 or MODE 6, 1 RCS relief valve inoperable.	F.1 Restore 2 RCS relief valves to OPERABLE status.	24 hours
G. Both RCS relief valves inoperable. OR Required Action and associated Completion Time of Condition A through Condition F not met. OR LTOP System inoperable for any reason other than Condition A through Condition F.	G.1 Depressurize RCS and establish RCS vent of $\geq$ [2.07] square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.12.1 Verify only [1] [HPI] pump OPERABLE.	Within 15 minutes before decreasing RCS cold leg temperature to ≤ [275]°F AND 12 hours
[SR 3.4.12.2 Verify only 1 charging pump OPERABLE.	Within 15 minutes before decreasing RCS cold leg temperature to ≤ [275]° AND 12 hours]
SR 3.4.12.3 Verify each accumulator isolated.	Within 15 minutes before decreasing RCS cold leg temperature to ≤ [275]°F AND 12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
[SR 3.4.12.4	Verify RHR suction valve open for each required RHR suction relief valve.	12 hours]
SR 3.4.12.5	Verify RCS vent ≥ [2.07] square inches open: a. For unlocked-open vent valve(s). b. For locked-open vent valve(s).	 12 hours 31 days
SR 3.4.12.6	Verify PORV block valve open for each required PORV.	72 hours
[SR 3.4.12.7	Verify associated RHR suction isolation valve locked open with operator power removed for each required RHR suction relief valve.	31 days]
SR 3.4.12.8	--------------------NOTE-------------------- SR 3.0.4 is not applicable. --- Perform ANALOG CHANNEL OPERATIONAL TEST on each required PORV, excluding actuation.	Within 12 hours after decreasing RCS cold leg temperature to ≤ [275]°F AND 31 days
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each PORV.	[18] months

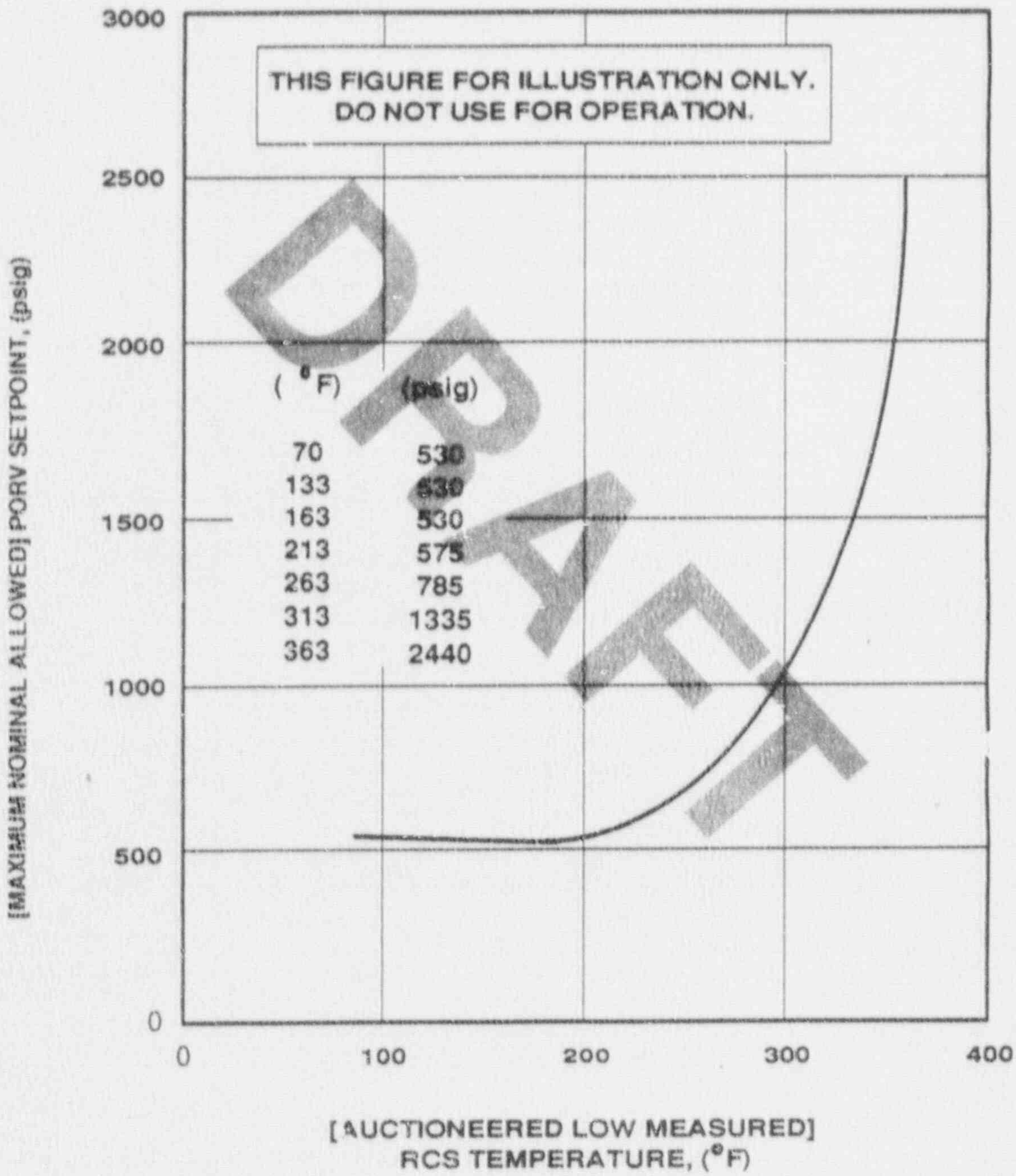

Figure 3.4.12-1
PORV Setpoint vs. RCS Temperature

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 1 gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE;

d. 1 gpm total primary-to-secondary LEAKAGE through all steam generators (SGs); and

e. [500] gallons per day primary-to-secondary LEAKAGE through any 1 SG.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	---------------------NOTE-------------------- SR 3.0.4 is not applicable for entry into MODES 3 and 4. --- Perform an RCS water inventory balance.	------NOTE----- Only required during steady-state operation --------------- 72 hours
SR 3.4.13.2	Verify, by visual inspection, the reactor coolant pressure boundary is leaktight.	[18] months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 RCS Pressure Isolation Valve (PIV) Leakage

LCO 3.4.14 Leakage from each RCS PIV shall be ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at a RCS pressure
≥ [2215] and ≤ [2255] psia.

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

-----------------------------NOTE-----------------------------
For this LCO, each flow path is treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Leakage from 1 or more RCS PIVs not within limit.	A.1 Restore RCS PIV leakage to within limit. OR	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	-------------NOTE------------ Each valve used to satisfy Required Action A.2.1 or Required Action A.2.2 must have been demonstrated to meet SR 3.4.14.1 and be on the RCS pressure boundary. -----------------------------	
	A.2.1 Isolate the high-pressure portion of the affected system from the low-pressure portion by use of 1 closed manual, deactivated automatic, or check valve.	4 hours
	AND	
	A.2.2 Isolate the high-pressure portion of the affected system from the low-pressure portion by use of a second closed manual, deactivated automatic, or check valve.	72 hours
	AND	
	A.2.3 Verify each affected flow path is isolated by two closed manual, deactivated automatic, or check valves.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One or more RCS PIVs inoperable in 1 or more flow paths.	B.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of support RCS PIV flow paths have been initiated.	[ ] hours [, where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
C. One or more RCS RIVs inoperable in 1 or more flow paths. AND One or more RCS PIVs inoperable associated with the redundant flow path(s). OR One or more required support features inoperable associated with the redundant flow path(s).	C.1	Enter LCO 3.0.3 unless the loss of functional capability is allowed in the support or supported feature LCO.	Immediately
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	---------------------NOTE--------------------- SR 3.0.4 is not applicable for entry into MODES 3 and 4 for the purposes of testing the isolation valves. -- Verify leakage from each RCS isolation valve ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at a RCS pressure ≥ [2215] psia and ≤ [2255] psia.	[18] months <u>AND</u> [Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months <u>AND</u>] Within 24 hours following valve actuation due to automatic or manual action or flow through the valve
[SR 3.4.14.2	Demonstrate Residual Heat Removal (RHR) System auto-closure interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ [425] psig.	[18] months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
[SR 3.4.14.3 Demonstrate RHR System auto-closure interlock causes the valves to close automatically with a simulated or actual RCS pressure signal $\geq$ [600] psig.	[18] months]

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Required Actions and associated Completion Times not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours
F. All required monitors inoperable.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform a CHANNEL CHECK of required containment sump monitor.	12 hours
SR 3.4.15.2	Perform a CHANNEL CHECK of required containment atmosphere radioactivity monitor.	12 hours
[SR 3.4.15.3	Perform a CHANNEL CHECK of required containment air cooler condensate flow rate monitor.	12 hours]
SR 3.4.15.4	Perform an ANALOG CHANNEL OPERATIONAL TEST of required containment sump monitor.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.15.5	Perform an ANALOG CHANNEL OPERATIONAL TEST of required containment atmosphere radioactivity monitor.	31 days
[SR 3.4.15.6	Perform an ANALOG CHANNEL OPERATIONAL TEST of required containment air cooler condensate flow rate monitor.	31 days]
SR 3.4.15.7	Perform a CHANNEL CALIBRATION of required containment sump monitors.	[18] months
[SR 3.4.15.8	Perform a CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	[18] months
[SR 3.4.15.9	Perform a CHANNEL CALIBRATION of required containment air cooler condensate flow rate monitor.	[18] months]

[For units with only 2 monitors required by the LCO, Required Action B.2 applies but neither Conditions C nor D apply, nor do SR 3.4.15.3, SR 3.4.15.6, and SR 3.4.15.9.

For units with 3 monitors required by the LCO, Required Action B.2 does not apply and Conditions C and D do apply, as well as SR 3.4.15.3, SR 3.4.15.6, and SR 3.4.15.9.]

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the primary coolant shall be limited to:

a. A gross specific activity $\leq 100/\bar{E}$ μCi/gm; and

b. A DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature $\geq$ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Gross specific activity of the primary coolant not within limit.	A.1	Determine DOSE EQUIVALENT I-131.	4 hours
	AND		
	A.2	Be in MODE 3 with RCS average temperature < 500°F.	6 hours
B. DOSE EQUIVALENT I-131 > 1.0 μCi/gm.	B.1	Demonstrate DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	Once per 4 hours
	AND		
	B.2	Restore DOSE EQUIVALENT I-131 to within limit.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Actions and associated Completion Times of Condition B not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.	C.1 Be in MODE 3 with RCS average temperature < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.16.1 Demonstrate primary coolant gross specific activity $\leq 100/\bar{E}$ μCi/gm.	7 days
SR 3.4.16.2 Demonstrate primary coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of $\geq 15\%$ of RATED THERMAL POWER within a 1-hour period

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.16.3	-----NOTES----- 1. SR 3.0.4 is not applicable. 2. Sample after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for $\geq$ 48 hours. --------------- Determine $\bar{E}$.	184 days

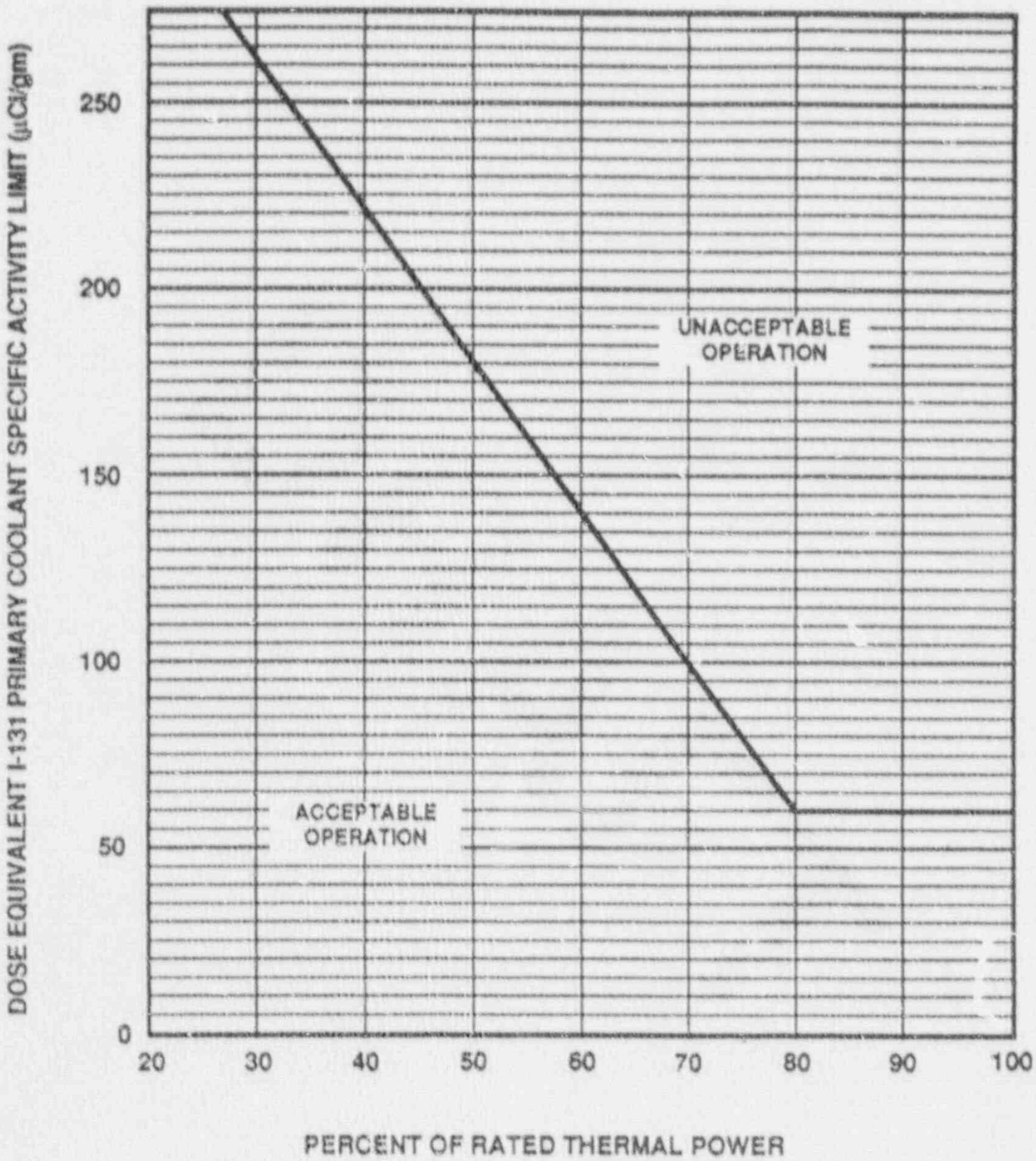

Figure 3.4.16-1 (Page 1 of 1)

Primary Coolant DOSE EQUIVALENT I-131 Specific Activity Limit Versus Percent of RATED THERMAL POWER

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 RCS Loop Isolation Valves

LCO 3.4.17 Each RCS hot and cold leg loop valve shall be open with power removed from each isolation valve operator.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Power available to 1 or more loop isolation valve operators.	A.1 Remove power from loop isolation valve operators.	30 minutes
B. --------NOTE--------- All Required Actions must be completed whenever this Condition is entered. --------------------- One or more RCS loop isolation valves closed.	B.1 Maintain valve(s) closed. AND B.2 Be in MODE 4. AND B.3 Be in MODE 5.	Immediately 6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.17.1 Verify each RCS loop isolation valve open and power removed from each loop isolation valve operator.	31 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.18 RCS Isolated Loop Startup

LCO 3.4.18 Each RCS isolated loop shall remain isolated with:

a. The hot and cold leg isolation valves closed if boron concentration of the isolated loop is < boron concentration of the operating loops; and

b. The cold leg isolation valve closed if the cold leg temperature of the isolated loop is > [ ]°F below the highest cold leg temperature of the operating loops.

APPLICABILITY: MODES 5 and 6.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Isolated loop hot or cold leg isolation valve open with LCO requirements not met.	A.1	----------NOTE------- Only required if boron concentration requirement not met. --------------------	
		Close hot and cold leg isolation valves.	Immediately
	OR		
	A.2	---------NOTE------- Only required if temperature requirement not met. --------------------	
		Close cold leg isolation valve.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.18.1	Verify cold leg temperature of isolated loop is ≤ [ ]°F below the highest cold leg temperature of the operating loops.	Within 30 minutes prior to opening the cold leg isolation valve in isolated loop
SR 3.4.18.2	Verify that boron concentration of isolated loop is ≥ boron concentration of the operating loops.	Within 2 hours prior to opening the hot or cold leg isolation valve in isolated loop

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.19 RCS Loops Test Exceptions

LCO 3.4.19 The requirements of LCO 3.4.4, "RCS Loops—MODES 1 & 2," may be suspended.

APPLICABILITY: During startup and PHYSICS TESTS with THERMAL POWER < P-7.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER > P-7.	A.1 Open reactor trip breakers.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.19.1 Verify that THERMAL POWER is < P-7.	1 hour
SR 3.4.19.2 Perform ANALOG CHANNEL OPERATIONAL TEST for each power range neutron flux—low and intermediate range neutron flux channel and P-7.	Within 12 hours prior to initiation of startup and PHYSICS TESTS

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1 [Four] ECCS accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure > [1000] psig.

------------------------------NOTE------------------------------
For this LCO, Conditions A and B are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One accumulator inoperable due to boron concentration not within limits.	A.1	Restore boron concentration to within limits.	72 hours
B. One accumulator inoperable for reasons other than Condition A.	B.1	Restore accumulator to OPERABLE status.	1 hour
C. Required Actions and associated Completion Times of Condition A or B not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Reduce pressurizer pressure to ≤ [1000] psig.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. More than one accumulator inoperable.	D.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify that each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify that borated water volume in each accumulator is ≥ [7853 gallons ( )% and ≤ 8171 gallons ( )%].	12 hours
SR 3.5.1.3	Verify that nitrogen cover pressure in each accumulator is ≥ [385] psig and ≤ [481] psig.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.1.4	Verify that boron concentration in each accumulator is ≥ [1900] ppm and ≤ [2100] ppm.	31 days AND Once within 6 hours after each solution volume increase of ≥ [ ] gallons ([1]% of tank volume) that is not the result of addition from the refueling water storage tank
SR 3.5.1.5	-------------------NOTE--------------- Only required when pressurizer pressure ≥ [2000] psig. -------------------------------------- Verify that power is removed from each accumulator isolation valve operator.	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS—Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

-----NOTES-----

1. In MODE 3, both safety injection (SI) pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve (PIV) testing per SR 3.4.14.1 (Reactor Coolant System PIV leakage testing).

2. LCO 3.0.4 and SR 3.0.4 are not applicable for entry into MODE 3 for the pump(s) declared inoperable pursuant to LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System." The exception is allowed for up to 4 hours following entry into MODE 3 or prior to the temperature of one or more of the RCS cold legs exceeding [375]°F, whichever comes first.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
			------NOTE----- Completion Time is on a Condition basis ---------------
A. One or more components inoperable. AND At least 100% of the SI flow equivalent to a single OPERABLE ECCS train available.	A.1	Restore component(s) to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1 Verify that the following valves are in the listed position with power to the valve operator removed. Valve Number / Position / Function [ ] [ ] [ ] [ ] [ ] [ ] . . . . [ ] [ ] [ ]	12 hours
SR 3.5.2.2 Verify that each ECCS manual, power-operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
[SR 3.5.2.3 Demonstrate that ECCS piping is full of water.	31 days]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.4	Demonstrate that each ECCS pump's developed head at the test flow point is ≥ the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.5	Demonstrate that each ECCS automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.5.2.6	Demonstrate that each ECCS pump starts automatically on an actual or simulated actuation signal.	[18] months
SR 3.5.2.7	Demonstrate, for each ECCS throttle valve listed below, that each position stop is in its correct position. <u>Valve Number</u> [ ] [ ] . . . [ ]	[18] months
SR 3.5.2.8	Verify, by visual inspection, that each ECCS train containment sump suction inlet is not restricted by debris and that the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	[18] months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS—Shutdown

LCO 3.5.3 One ECCS train shall be OPERABLE.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Required ECCS residual heat removal (RHR) subsystem inoperable.	A.1	Initiate actions to restore ECCS RHR subsystem to OPERABLE status.	15 minutes
B. Required ECCS high-head subsystem inoperable.	B.1	---------NOTE-------- With no required ECCS RHR subsystems OPERABLE, continue to restore ECCS high-head subsystem to OPERABLE status. ------------------- Restore ECCS high-head subsystem to OPERABLE status.	 1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1	--------NOTE------- Only required if at least one RHR loop is OPERABLE. ------------------ Be in MODE 5.	 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Perform the following surveillances for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.5 SR 3.5.2.2 SR 3.5.2.6 SR 3.5.2.3 SR 3.5.2.7 SR 3.5.2.4 SR 3.5.2.8	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	[-----NOTE----- Only required when ambient air temperature is < [35]°F or > [100]°F. ------------] Verify that RWST borated water temperature is ≥ [35]°F and ≤ [100]°F.	24 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.4.2	Verify that RWST borated water volume is ≥ [466,200 gallons ( )%].	7 days
SR 3.5.4.3	Verify that RWST boron concentration is ≥ [2000] ppm and ≤ [2200] ppm.	7 days

3.5. EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow shall be ≤ [40] gpm with [centrifugal charging pump discharge header] pressure ≥ [2480] psig and the [charging flow] control valve full open.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Seal injection flow not within limit.	A.1	Reduce flow to within limit.	1 hour
	AND		
	A.2	Adjust manual seal injection throttle valves to give a flow within limit with [centrifugal charging pump discharge header] pressure ≥ [2480] psig and the [charging flow] control valve full open.	4 hours
B. Required Actions and associated Completion Times not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	-------------------NOTE-------------------- SR 3.0.4 is not applicable for entry into MODE 3. This exception is allowed for up to 4 hours after the Reactor Coolant System pressure stabilizes at ≥ [2215 psig and ≤ 2255 psig]. --- Verify that manual seal injection throttle valves are adjusted to give a flow within limit with [centrifugal charging pump discharge header] pressure ≥ [2480] psig and the [charging flow] control valve full open.	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 Boron Injection Tank (BIT)

LCO 3.5.6 The BIT shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. BIT inoperable.	A.1 Restore BIT to OPERABLE status.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Borate to a SHUTDOWN MARGIN equivalent to [1%] $\Delta k/k$ at 200°F.	6 hours 6 hours
C. BIT inoperable and Required Actions and associated Completion Times of Condition B have been met.	C.1 Restore BIT to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	Verify BIT borated water temperature is ≥ [145]°F.	24 hours
SR 3.5.6.2	Verify BIT borated water volume is ≥ [ ] gallons.	7 days
SR 3.5.6.3	Verify BIT boron concentration is ≥ [20,000] ppm and ≤ [22,500] ppm.	7 days

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
		-----NOTE----- SR 3.0.2 is not applicable
SR 3.6.1.1	Perform required visual examinations and leakage-rate testing except for containment air-lock testing, in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, as contained in the Containment Leakage Rate Testing Program. The maximum allowable leakage rate, L_a, is [ ]% of containment air weight per day at the calculated peak containment pressure, P_a.	In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, as contained in the Containment Leakage Rate Testing Program
[SR 3.6.1.2	Demonstrate containment structural integrity in accordance with the Containment Tendon Surveillance Program (atmospheric and subatmospheric).	In accordance with the Containment Tendon Surveillance Program]

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Locks (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.2 [Two] containment air lock(s) shall be OPERABLE.

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

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

1. Entry and exit is permissible to perform repairs of the affected air lock components.

2. For this LCO, all containment air locks are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One containment air-lock door inoperable in 1 or more containment air locks.	A.1	Verify an OPERABLE door is closed in each affected air lock.	1 hour
	AND		
	A.2.1	Restore air lock(s) to OPERABLE status.	24 hours
	OR		
	A.2.2.1	Lock the OPERABLE door closed in the affected air lock.	24 hours
		AND	
	A.2.2.2	Verify an OPERABLE door locked-closed in the affected air lock.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ----------NOTE-------- Entry and exit of containment is permissible under the control of a dedicated individual if 1 or more air locks are inoperable. --------------------- Containment air-lock interlock mechanism inoperable in 1 or more containment air locks.	B.1	Verify an OPERABLE door is closed in each affected air lock.	1 hour
	AND		
	B.2.1	Restore air-lock interlock mechanism to OPERABLE status.	24 hours
	OR		
	B.2.2.1	Lock the OPERABLE door closed in each affected air lock.	24 hours
		AND	
	B.2.2.2	Verify an OPERABLE door is locked-closed in each affected air lock.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	-------------NOTE------------ If both doors in an air lock have failed the seal test, containment shall be declared inoperable in accordance with LCO 3.6.1. ----------------------------	
C. One or more containment air locks inoperable for reasons other than Condition A or B.	C.1 Verify a door is closed in each affected air lock. AND C.2 Restore air lock(s) to OPERABLE status.	1 hour 24 hours
D. Required Actions and associated Completion Times not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
---NOTE--- An inoperable air-lock door does not invalidate the previous successful performance of an overall air-lock leakage test.	---NOTE--- SR 3.0.2 is not applicable
SR 3.6.2.1 Perform required air-lock leakage-rate testing in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions [as contained in the Containment Leakage Rate Testing Program]. The acceptance criteria for air-lock testing are: a. Overall air-lock leakage rate is $\leq$ [0.05] L_a when tested at $\geq$ [ ] P_a. b. For each door, leakage rate is $\leq$ [.01] L_a when tested at $\geq$ [9] psig.	In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions [as contained in the Containment Leakage Rate Testing Program]
SR 3.6.2.2 Demonstrate only one door in each air lock can be opened at a time.	[---NOTE--- Only required if not performed within previous 184 days --- Prior to entry into Containment] [18 months (sub-atmospheric contain-ments)]

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

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

---NOTES---

1. Normally locked- or sealed-closed isolation valves [except for 42-inch purge valves] may be opened intermittently under administrative controls.

2. For this LCO, each penetration flow path is treated as an independent entity with an independent Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	---NOTE--- Not applicable to those penetrations that have only 1 isolation valve. ---	
A. ---NOTE--- Not applicable to those penetrations with only 1 containment isolation valve and a closed system inside containment. --- One or more containment isolation valves inoperable.	A.1 Verify at least 1 isolation valve is OPERABLE in each affected open penetration.	1 hour
	AND	
	A.2.1 Restore the valve(s) to OPERABLE status.	4 hours
	OR	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.2.1	Isolate each affected penetration by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve inside containment with flow through the valve secured. AND	4 hours
	A.2.2.2	Verify each affected penetration is isolated.	Once per 31 days for valves outside containment AND Prior to entering MODE 4 from MODE 5 if not performed more often than once per 92 days for valves inside containment

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- Only applicable to those penetrations with only 1 containment isolation valve and a closed system inside containment. --------------------- One or more containment isolation valves inoperable.	B.1 Restore the valve(s) to OPERABLE status.	[4] hours
	OR	
	B.2.1 Isolate each affected penetration by use of at least 1 closed and deactivated automatic valve, closed manual valve, or blind flange.	[4] hours
	AND	
	B.2.2 Verify each affected penetration is isolated.	Once per 31 days
C. One or more containment purge valves not within purge valve leakage limits.	C.1 Restore leakage within limits.	24 hours
	OR	
	C.2.1 Isolate each affected penetration by use of at least 1 closed and deactivated automatic valve, closed manual valve or blind flange.	24 hours
	AND	
	C.2.2 Perform SR 3.6.3.7.	Once per 92 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more containment isolation valves inoperable in one or more penetration flow paths.	D.1	Verify the Required Actions for those supported systems declared inoperable by the inoperability of support containment isolation valves have been initiated.	[ ] hours [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
E. One or more containment isolation valves inoperable in 1 or more penetration flow paths. AND One or more required support or supported features inoperable associated with the other redundant penetration flow paths.	E.1	Enter LCO 3.0.3, unless the loss of functional capability is allowed in the support or supported feature LCO.	Immediately
F. Required Actions and associated Completion Times not met.	F.1	Be in MODE 3.	6 hours
	AND		
	F.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Verify each [42]-inch purge valve is sealed-closed.	31 days
[SR 3.6.3.2	------------------NOTE------------------ The [8]-inch purge valve may be open for pressure control, as low as reasonably achievable and air quality considerations for personnel entry, and for Surveillance tests that require the valves to be open. -- Verify each [8]-inch purge valve is closed.	31 days]
SR 3.6.3.3	------------------NOTES------------------ 1. Valves and blind flanges in high-radiation areas may be verified by use of administrative controls. 2. Normally locked- or sealed-closed isolation valves may be opened intermittently under administrative controls. 3. This SR is not required to be met on valves that are open under administrative controls. -- Verify all containment isolation manual valves and blind flanges that are located outside containment and required to be closed during accident conditions are closed.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.3.4	-------------------NOTES------------------- 1. Normally locked- or sealed-closed isolation valves may be opened intermittently under administrative controls. 2. This SR is not required to be met on valves that are open under administrative controls. --- Verify all containment isolation manual valves and blind flanges that are located inside containment and required to be closed during accident conditions are closed.	 Prior to entering MODE 4 from MODE 5 if not performed more often than once per 92 days
SR 3.6.3.5	Demonstrate the isolation time of each power-operated and each automatic containment isolation valve is within limits.	[In accordance with Inservice Inspection and Testing Program, or 92 days]
SR 3.6.3.6	Demonstrate each automatic containment isolation valve actuates to its isolation position on an actual or simulated actuation signal(s).	[18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.7	---NOTE--- Results shall be evaluated against acceptance criteria of SR 3.6.1.1 in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions as contained in the Containment Leakage Rate Testing Program. ------ Perform additional required leakage rate testing for containment purge valves with resilient seals in accordance with the Containment Leakage Rate Testing Program.	184 days AND Within 92 days after opening the valve
[SR 3.6.3.8	Cycle each weight- or spring-loaded check valve testable during plant operation through one complete cycle of full travel, and verify each check valve remains closed when the differential pressure in the direction of flow is ≤ [1.2] psid and opens when the differential pressure in the direction of flow is ≥ [1.2] psid and < [5.0] psid.	92 days]
[SR 3.6.3.9	Cycle each weight- or spring-loaded check valve not testable during plant operation through one complete cycle of full travel, and verify each check valve remains closed when the differential pressure in the direction of flow is ≤ [1.2] psid and opens when the differential pressure in the direction of flow is ≥ [1.2] psid and < [5.0] psid.	18 months]

3.6 CONTAINMENT SYSTEMS

3.6.4A <u>Containment Pressure</u> (Atmospheric, Dual, and Ice Condenser)

LCO 3.6.4A Containment pressure shall be ≥ [-0.3] psig and ≤ [+1.5] psig.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4A.1 Verify containment pressure is ≥ [-0.3] psig and ≤ [+1.5] psig.	12 hours

3.6 CONTAINMENT SYSTEMS

3.6.4B Containment Pressure (Subatmospheric)

LCO 3.6.4B Containment air partial pressure shall be ≥ [9.0] psia and within the acceptable operation range shown on Figure 3.6.4B-1.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4B.1 Verify containment air partial pressure ≥ [9.0] psia and within the acceptable range shown on Figure 3.6.4B-1.	12 hours

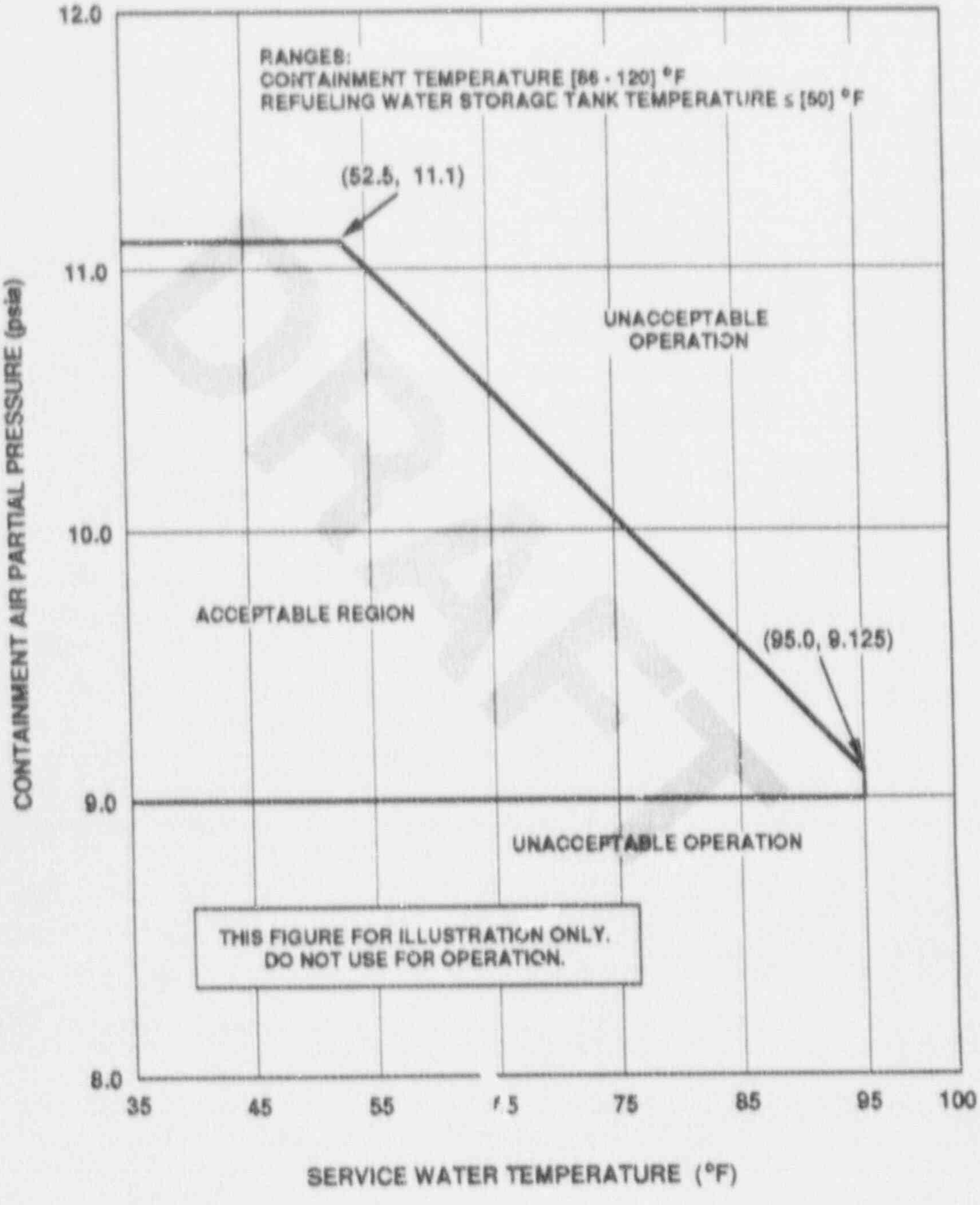

Figure 3.6.4B-1
Containment Air Partial Pressure Versus
Service Water Temperature

3.6 CONTAINMENT SYSTEMS

3.6.5A Containment Air Temperature (Atmospheric & Dual)

LCO 3.6.5A Containment average air temperature shall be ≤ [120]°F.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.5A.1 Verify containment average air temperature is ≤ [120]°F.	24 hours

3.6 CONTAINMENT SYSTEMS

3.6.5B Containment Air Temperature (Ice Condenser)

LCO 3.6.5B Containment average air temperature shall be:

a. ≥ [85]°F and ≤ [110]°F for the containment upper compartment, and

b. ≥ [100]°F and ≤ [120]°F for the containment lower compartment.

-----NOTE-----
The minimum Containment average air temperature in MODES 2, 3, and 4 may be reduced to [60]°F.

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

ACTIONS

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

3.6 CONTAINMENT SYSTEMS

3.6.6A <u>Containment Spray and Cooling Systems</u> (Atmospheric & Dual)
(Credit taken for iodine removal by the Containment Spray System)

LCO 3.6.6A Two containment spray trains and [2] containment cooling trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment Spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 84 hours
C. One containment cooling train inoperable.	C.1 Restore containment cooling train to OPERABLE status.	7 days
D. Two containment cooling trains inoperable.	D.1 Restore 1 containment cooling train to OPERABLE status.	72 hours

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.6B Containment Spray and Cooling Systems—(Atmospheric & Dual) (Credit not taken for iodine removal by the Containment Spray System)

LCO 3.6.6B Two containment spray trains and [2] containment cooling trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One containment spray train inoperable.	A.1	Restore containment spray train to OPERABLE status.	7 days
B. One containment cooling train inoperable.	B.1	Restore containment cooling train to OPERABLE status.	7 days
C. Two containment spray trains inoperable.	C.1	Restore 1 containment spray train to OPERABLE status.	72 hours
D. One containment spray train and 1 containment cooling train inoperable.	D.1	Restore containment spray train to OPERABLE status.	72 hours
	OR		
	D.2	Restore containment cooling train to OPERABLE status.	72 hours

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.6C Containment Spray System (Ice Condenser)

LCO 3.6.6C Two containment spray trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.6C.1 Verify each containment spray manual, power-operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6D.2	Demonstrate each QS pump's developed head at the flow test point is ≥ the required developed head.	In accordance with the Inservice Inspection and Test Program
SR 3.6.6D.3	Demonstrate each QS automatic valve in the flowpath actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.6.6D.4	Demonstrate each QS pump starts automatically on an actual or simulated actuation signal.	[18] months
SR 3.6.6D.5	Demonstrate each spray nozzle is unobstructed.	10 years

3.6 CONTAINMENT SYSTEMS

3.6.6E <u>Recirculation Spray (RS) System</u> (Subatmospheric)

LCO 3.6.6E Four RS subsystems [and a casing cooling tank] shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RS subsystem inoperable.	A.1	Restore RS subsystem to OPERABLE status.	7 days
. Two RS subsystems inoperable in 1 train.	B.1	Restore 1 RS subsystem to OPERABLE status.	72 hours
[C. Two inside RS subsystems inoperable.	C.1	Restore 1 RS subsystem to OPERABLE status.	72 hours]
[D. Two outside RS subsystems inoperable.	D.1	Restore 1 RS subsystem to OPERABLE status.	72 hours]
[E. Casing cooling tank inoperable.	E.1	Restore casing cooling tank to OPERABLE status.	72 hours]

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. Required Actions and associated Completion Times not met.	F.1	Be in MODE 3.	6 hours
	AND		
	F.2	Be in MODE 5.	84 hours
G. Three or more RS subsystems inoperable.	G.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6E.1	Verify casing cooling tank temperature ≥ [35]°F and ≤ [50]°F.	24 hours
SR 3.6.6E.2	Verify casing cooling tank contained borated water volume ≥ [116,500] gal.	7 days
SR 3.6.6E.3	Verify casing cooling tank boron concentration ≥ [2,300] ppm and ≤ [2,400] ppm.	7 days
SR 3.6.6E.4	Verify each RS [and casing cooling] manual, power-operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6E.5	Demonstrate each RS [and casing cooling] pump's developed head at the flow test point is ≥ the required developed head.	In accordance with the Inservice Inspection and Test Program
SR 3.6.6E.6	Demonstrate on an actual or simulated actuation signal(s): a. Each RS automatic valve in the flow path actuates to its correct position; b. Each RS pump starts automatically; [c. Each casing cooling pump starts automatically.]	[18] months
SR 3.6.6E.7	Demonstrate each spray nozzle is unobstructed.	10 years

3.6 CONTAINMENT SYSTEMS

3.6.7 Spray Additive System (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.7 The Spray Additive System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spray Additive System is inoperable.	A.1	Restore Spray Additive System to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 AND B.2	Be in MODE 3 Be in MODE 5	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify each Spray Additive System manual, power-operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.7.2	Verify spray chemical addition tank (SCAT) solution volume is ≥ [2568] gal and ≤ [4000] gal.	184 days
SR 3.6.7.3	Verify SCAT [NaOH] solution concentration is ≥ [30]% and ≤ [32]% by weight.	184 days
SR 3.6.7.4	Demonstrate each Spray Additive System automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.6.7.5	Demonstrate Spray Additive System flow [rate] from each solution's flow path.	5 years

3.6 CONTAINMENT SYSTEMS

3.6.8 Hydrogen Monitors—MODES 1 & 2 (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.8 Two hydrogen monitors shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One hydrogen monitor inoperable.	A.1	Restore one hydrogen monitor to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Perform ANALOG CHANNEL OPERATIONAL TEST.	92 days
SR 3.6.8.2	Perform CHANNEL CALIBRATION.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.9 Hydrogen Recombiners—MODES 1 & 2 (Atmospheric, Subatmospheric, Ice Condenser, and Dual) (if permanently installed)

LCO 3.6.9 Two hydrogen recombiners shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One hydrogen recombiner inoperable.	A.1	Restore 1 hydrogen recombiner to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.9.1	Perform a system functional test for each hydrogen recombiner.	[18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.9.2	Visually examine each hydrogen recombiner enclosure and ensure there is no evidence of abnormal conditions.	[18] months
SR 3.6.9.3	Perform a resistance-to-ground test of each heater phase.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.10 Hydrogen Mixing System (HMS)—MODES 1 & 2 (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.10 [Two] HMS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One HMS train inoperable.	A.1	Restore 1 HMS train to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.10.1	Operate each HMS train for $\geq$ 15 minutes.	92 days
SR 3.6.10.2	Demonstrate each HMS train flow rate on slow speed $\geq$ [4000] cfm.	[18] months
SR 3.6.10.3	Demonstrate each HMS train starts on an actual or simulated actuation signal.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.11 Hydrogen Ignition System (HIS)—MODES 1 & 2 (Ice Condenser)

LCO 3.6.11 Two HIS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One HIS subsystem is inoperable.	A.1	Restore HIS subsystem to OPERABLE status.	7 days
B. [Two] hydrogen ignitors in 1 or more containment regions inoperable.	--------------NOTE------------- For this Required Action, each containment region is treated as an independent entity with an independent Completion Time. -------------------------------		
	B.1	Verify both hydrogen ignitors in each of 2 adjacent regions are not inoperable.	1 hour
	<u>AND</u>		
	B.2	Restore 1 hydrogen ignitor in each region to OPERABLE status.	7 days
C. Required Actions and associated Completion Times not met.	C.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.11.1	---------------NOTE-------------------------- Inoperable ignitors shall not be on redundant circuit, which provide coverage for the same containment region. --- Energize both HIS subsystem power supply breakers and verify ≥ [64] ignitors are energized.	92 days
SR 3.6.11.2	Energize each hydrogen ignitor and verify temperature ≥ [1700]°F.	18 months

3.6 CONTAINMENT SYSTEMS

3.6.12 Iodine Cleanup System (ICS) (Atmospheric & Subatmospheric)

LCO 3.6.12 Two ICS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.12.1 Operate each ICS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.12.2	Perform required ICS filter testing in accordance with the Ventilation Filter Testing Program.	In accordance with the Ventilation Filter Testing Program
SR 3.6.12.3	Demonstrate each ICS train actuates on an actual or simulated actuation signal.	[18] months
SR 3.6.12.4	Demonstrate each ICS filter bypass damper can be opened.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.13 Vacuum Relief Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.13 [Two] vacuum relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.13.1	Demonstrate each vacuum relief valve OPERABLE in accordance with the Inservice Inspection and Testing Program.	In accordance with the Inservice Inspection and Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.14 Shield Building Air Cleanup System SBACS (Dual and Ice Condenser)

LCO 3.6.14 Two SBACS trains shall be OPERABLE [and all shield building access opening doors shall be closed].

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SBACS train inoperable.	A.1 Restore SBACS train to OPERABLE status.	7 days
[B. ---------NOTE-------- For this Condition, each shield building access opening door is treated as an independent entity with an independent Completion Time. -------------------- One or more shield building access opening door open	B.1 ---------NOTE------- Entry and exit through closed access opening doors are permissible for normal transit. ------------------- Close shield building access opening doors.	24 hours]
C. Required Actions and associated Completion Times not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.14.1	Operate each SBACS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.6.14.2	Perform required filter testing in accordance with the Ventilation Filter Testing Program.	In accordance with the Ventilation Filter Testing Program
SR 3.6.14.3	Demonstrate each SBACS train actuates on an actual or simulated actuation signal.	[18] months
SR 3.6.14.4	Demonstrate each SBACS filter bypass damper can be opened.	[18] months
SR 3.6.14.5	Demonstrate each SBACS train produces a pressure equal to or more negative than [-0.5]-inch water gauge in the annulus within [22] seconds after a start signal.	[18] months
[SR 3.6.14.6	Verify each shield building access opening door is closed.	24 hours]

3.6 CONTAINMENT SYSTEMS

3.6.15 Air Return System (ARS) (Ice Condenser)

LCO 3.6.15 Two ARS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ARS train inoperable.	A.1 Restore ARS train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.15.1	Demonstrate each ARS fan starts on an actual or simulated actuation signal, after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes.	92 days
SR 3.6.15.2	Demonstrate with the ARS fan dampers closed, each ARS fan motor current is ≥ [20.5] and ≤ [35.5] amps when the fan speed is ≥ [840] rpm and ≤ [900] rpm.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.15.3	Demonstrate with the ARS fan not operating, that each ARS fan damper opens when ≤ [11.0] lb are applied to the counterweight.	92 days
[SR 3.6.15.4	Demonstrate each motor-operated valve in the hydrogen-collection header opens on an actual or simulated actuation signal after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes.	92 days]

3.6 CONTAINMENT SYSTEMS

3.6.16 Ice Bed (Ice Condenser)

LCO 3.6.16 The ice bed shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Ice bed inoperable.	A.1 Restore ice bed to OPERABLE status.	48 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.16.1	Verify maximum ice bed temperature ≤ [27]°F.	12 hours
SR 3.6.16.2	Verify total weight of stored ice is ≥ [2,721,600] lb by: a. Weighing a representative sample of ≥ 144 ice baskets and verifying each basket contains ≥ [1400] lb of ice; and b. Calculating total weight of stored ice, at a 95% confidence level, using all ice basket weights determined in SR 3.6.16.2.a.	9 months
SR 3.6.16.3	Verify azimuthal distribution of ice at a 95% confidence level by subdividing weights, as determined by SR 3.6.16.2.a, into the following groups: a. Group 1—bays 1 through 8; b. Group 2—bays 9 through 16; and c. Group 3—bays 17 through 24. The average ice weight of the sample baskets in each group from radial rows 1, 2, 4, 6, 8, and 9 shall be ≥ [1400] lb.	9 months
SR 3.6.16.4	Verify, by visual inspection, accumulation of ice or frost on structural members comprising flow channels through the ice condenser ≤ [0.38] inches thick.	9 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.16.5	Verify by chemical analyses of ≥ 9 representative samples of stored ice: a. Boron concentration ≥ [1800] ppm; <u>AND</u> b. pH ≥ [9.0] and ≤ [9.5].	[18] months
SR 3.6.16.6	Visually inspect, for detrimental structural wear, cracks, corrosion, or other damage, 2 ice baskets from each azimuthal group of bays. See SR 3.6.17.3.	40 months

1

IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6"

3.6 CONTAINMENT SYSTEMS

3.6.17 Ice Condenser Doors (Ice Condenser)

LCO 3.6.17 The ice condenser inlet doors, intermediate deck doors, and top deck [doors] shall be OPERABLE and closed.

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

-----------------------NOTE-----------------------
For this LCO, all ice condenser doors are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more ice condenser inlet doors inoperable due to being physically restrained from opening.	A.1	Restore inlet doors to OPERABLE status.	1 hour
B. One or more ice condenser doors inoperable for reasons other than Condition A or not closed.	B.1	Verify maximum ice bed temperature ≤ [27]°F.	Once per 4 hours
	<u>AND</u>		
	B.2	Restore ice condenser doors to OPERABLE status and closed positions.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Actions and associated Completion Times of Condition B not met.	C.1	Restore ice condenser doors to OPERABLE status and closed positions.	48 hours
D. Required Actions and associated Completion Times of Condition A, B, or C not met.	D.1 AND D.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.17.1	Verify all inlet doors indicate closed by the Inlet Door Position Monitoring System.	12 hours
SR 3.6.17.2	Verify, by visual inspection, each intermediate deck door is closed and not impaired by ice, frost, or debris.	7 days
SR 3.6.17.3	Verify, by visual inspection, each inlet door is not impaired by ice, frost, or debris.	3 months during first year after receipt of license AND [6] months thereafter

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.17.4	Demonstrate torque required to cause each inlet door to begin to open is ≤ [675] inch•lbs.	3 months during first year after receipt of license AND [6] months thereafter
SR 3.6.17.5	Perform a torque test on [a sampling of ≥ 25% of the] inlet doors.	3 months during first year after receipt of license AND [6] months thereafter
SR 3.6.17.6	Verify for each intermediate deck door: a. No visual evidence of structural deterioration; b. Free movement of the vent assemblies; and c. Free movement of the door.	3 months during first year after receipt of license AND [18] months thereafter
SR 3.6.17.7	Verify, by visual inspection, each top deck [door]: a. Is in place; and b. Has no condensation, frost, or ice formed on the [doors] that would restrict their opening.	92 days

3.6 CONTAINMENT SYSTEMS

3.6.18 Divider Barrier Integrity (Ice Condenser)

LCO 3.6.18 Divider barrier integrity shall be maintained.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more personnel access doors or equipment hatches open or inoperable, other than for personnel transit entry.	A.1	----------NOTE------- For this action, all personnel access doors and equipment hatches are treated as an entity with a single Completion Time. --------------------- Restore personnel access doors and equipment hatches to OPERABLE status and closed positions.	1 hour
B. Divider barrier seal inoperable.	B.1	Restore seal to OPERABLE status.	1 hour
C. Required Actions and associated Completion Times not met.	C.1 AND C.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.18.1	Verify, by visual inspection, all personnel access doors and equipment hatches between upper and lower containment compartments closed.	Prior to entering MODE 4 from MODE 5
SR 3.6.18.2	Verify, by visual inspection, that the seals and sealing surfaces of each personnel access door and equipment hatch have: a. No detrimental misalignments; b. No cracks or defects in the sealing surfaces; and c. No apparent deterioration of the seal material.	Prior to final closure after each opening <u>AND</u> ----NOTE---- Only required for seals made of resilient materials ------------ 10 years
SR 3.6.18.3	Verify, by visual inspection, each personnel access door or equipment hatch that has been opened for personnel transit entry is closed.	After each opening
SR 3.6.18.4	Remove 2 divider barrier seal test coupons and verify: a. Both test coupons' tensile strength $\geq$ [120] psi; [and] b. Both test coupons' elongation $\geq$ [100]%.	[18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.18.5	Visually inspect ≥ [95]% of the divider barrier seal length, and verify: a. Seal and seal-mounting bolts are properly installed; and b. Seal material shows no evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearance.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.19 Containment Recirculation Drains (Ice Condenser)

LCO 3.6.19 The ice condenser floor drains and the refueling canal drains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One ice condenser floor drain inoperable.	A.1	Restore ice condenser floor drain to OPERABLE status.	1 hour
B. One refueling canal drain inoperable.	B.1	Restore refueling canal drain to OPERABLE status.	1 hour
C. Required Actions and associated Completion Times not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
SR 3.6.19.1	Verify by visual inspection that: a. Each refueling canal drain plug is removed; b. Each refueling canal drain is not obstructed by debris; and c. No debris is present in the upper compartment or refueling canal that could obstruct the refueling canal drain.	92 days AND Prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal
SR 3.6.19.2	Verify for each ice condenser floor drain that the: a. Valve disk opening is not impaired by ice, frost, or debris; b. Valve seat shows no evidence of damage; c. Valve gate opening force is ≤ [66] lb; and d. Drain line from the ice condenser floor to the lower compartment is unrestricted.	[18] months

3.6 CONTAINMENT SYSTEMS

3.6.20 <u>Shield Building</u> (Dual and Ice Condenser)

LCO 3.6.20 The shield building shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Shield building inoperable.	A.1 Restore shield building to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[SR 3.6.20.1	Verify annulus negative pressure > [5] inches water gauge.	12 hours]
SR 3.6.20.2	Verify each door in each access opening is closed except when the access opening is being used for normal transient entry and exit; then, at least 1 door shall be closed.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.20.3	Verify shield building structural integrity by performing a visual inspection of the exposed interior and exterior surfaces of the shield building.	During shutdown for SR 3.6.1.1 Type A tests

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

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

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ---------NOTE--------- Completion Time is on a Condition Basis. ---------------------- Less than the required MSSVs OPERABLE.	A.1	Verify that at least [two] required MSSVs per steam generator (SG) are OPERABLE.	4 hours
	AND		
	A.2.1	Restore MSSV(s) to OPERABLE status.	4 hours
	OR		
	A.2.2.1	Reduce power to ≤ the applicable % RATED THERMAL POWER (RTP) listed in Table 3.7.1-1.	4 hours
	AND		
	A.2.2.2	Reduce the power range neutron flux—high trip setpoint in accordance with Table 3.7.1-1.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Actions and associated Completion Times not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	---NOTE--- SR 3.0.4 is not applicable for entry into and operation in MODE 3 for the performance of this surveillance. --- Demonstrate the MSSVs lift setpoints per Table 3.7.1-2 in accordance with the Inservice Inspection and Testing Program.	In accordance with the Inservice Inspection and Testing Program

Table 3.7.1-1 (Page 1 of 1)

Power Range Neutron Flux—High Trip Setpoint versus OPERABLE MSSVs

MINIMUM NUMBER OF MSSVs PER SG REQUIRED OPERABLE	APPLICABLE POWER, % RTP	APPLICABLE TRIP SETPOINT, % RTP
5	> [87]	< [111.1]
4	< [87], ≥ [65]	< [87]
3	< [65], ≥ [43]	< [65]
2	< [43]	< [43]

Table 3.7.1-2 (Page 1 of 1)

MSSV Lift Settings

VALVE NUMBER				LIFT SETTING, PSIG, + 3%
SG #1	SG #2	[SG #3]	[SG #4]	

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

LCO 3.7.2 [Four] MSIVs shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with MSIVs open.

-----NOTE-----
Completion Time is on a Condition basis; Condition A and Conditions (C and D) Completion Times are independent.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV inoperable in MODE 1.	A.1 Restore MSIV to OPERABLE status.	[8] hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Close inoperable MSIV. AND B.2 Be in MODE 2.	6 hours 6 hours
C. One MSIV inoperable in MODE 2 or 3, in one or more flow paths.	C.1 Restore MSIV(s) to OPERABLE status. OR C.2.1 Close inoperable MSIV(s). AND	[8] hours [8] hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2.2	Verify that inoperable MSIV(s) remain closed.	Once per 12 hours
D. Two MSIVs inoperable in MODE 2 or 3, in the same flow path for one or more flow paths.	D.1	Restore at least one MSIV to OPERABLE status in each affected flow path.	1 hour
	<u>OR</u>		
	D.2	Close at least one inoperable MSIV in each affected flow path.	1 hour
E. Required Actions and associated Completion Times of Condition B, C, or D not met.	E.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	E.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------------------NOTE----------------- SR 3.0.4 is not applicable for entry into and operation in MODE 3 for the performance of this surveillance. --- Demonstrate that MSIV closure time ≤ [4.6] seconds on an actual or simulated actuation signal.	In accordance with the [Inservice Inspection and Testing Program, or 18 months]

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation and Regulation Valves (MFIVs and MFRVs) and Associated Bypass Valves

LCO 3.7.3 [Four] MFIVs, [four] MFRVs, [and associated bypass valves] shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 with MFIV, MFRV, [or bypass valve] open.

-----------------------------NOTE-----------------------------
For this LCO, Conditions A, B, and C are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One MFIV [or associated MFIV bypass valve] in one or more flow paths inoperable.	A.1	Restore MFIV(s) [or associated MFIV bypass valve(s)] to OPERABLE status.	72 hours
	OR		
	A.2.1	Close or isolate inoperable MFIV(s) [or associated MFIV bypass valve(s)].	72 hours
	AND		
	A.2.2	Verify inoperable MFIV(s) [or associated MFIV bypass valve(s)] are closed or isolated.	Once per 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One MFRV [or associated MFRV bypass valve] in one or more flow paths inoperable.	B.1	Restore MFRV(s) [or associated MFRV bypass valve(s)] to OPERABLE status.	72 hours
	<u>OR</u>		
	B.2.1	Close or isolate inoperable MFRV(s).	72 hours
	<u>AND</u>		
	B.2.2	Verify inoperable MFRV(s) [or associated MFRV bypass valve(s)] are closed and isolated.	Once per 12 hours
C. More than one valve in the same flow path inoperable, for one or more flow paths.	C.1	Restore affected valves in each flow path to OPERABLE status.	8 hours
	<u>OR</u>		
	C.2	Close affected valves or otherwise isolate each affected flow path.	8 hours
D. Required Actions and associated Completion Times 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
	------------------NOTE------------------ SR 3.0.4 is not applicable for entry into, and operation in MODE 3 for the performance of this surveillance. --	
SR 3.7.3.1	Demonstrate that the closure time of each MFIV, MFRV, and [associated Bypass Valves] is ≤ [7] seconds on an actual or simulated actuation signal.	In accordance with the [Inservice Inspection and Testing Program, or 18 months]

3.7 PLANT SYSTEMS

3.7.4 Auxiliary Feedwater (AFW) System

LCO 3.7.4 [Three] AFW trains shall be OPERABLE.

----------------------------NOTE----------------------------
Only one motor-driven pump AFW train is required in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

----------------------------NOTE----------------------------
For this LCO, all the components of the AFW trains are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
[A. One steam supply to turbine-driven AFW train inoperable.	A.1	Restore steam supply to OPERABLE status.	7 days]
B. One AFW train inoperable for reasons other than Condition A.	B.1	Restore AFW train to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Actions and associated Completion Times for Condition A or B not met. OR Two AFW trains inoperable.	C.1 AND C.2	Be in MODE 3. --------NOTE------- Only required if at least one R residual heat removal loop is OPERABLE and in operation. ------------------- Be in MODE 4.	6 hours 18 hours
D. Three AFW trains inoperable.	D.1	--------NOTE------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until at least one AFW train is restored to OPERABLE status. ------------------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.4.1	Verify that each AFW manual, power-operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine-driven pump, that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
SR 3.7.4.2	------------------NOTE------------------ SR 3.0.4 is not applicable for entry into MODE 3 for purposes of testing the turbine-driven AFW pump. -- Demonstrate that each AFW pump's developed head at the flow test point is ≥ the required developed head.	 [31] days on a STAGGERED TEST BASIS
SR 3.7.4.3	Demonstrate that each AFW automatic valve actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.7.4.4	------------------NOTE------------------ SR 3.0.4 is not applicable for entry into MODE 3 for purposes of testing the turbine-driven AFW pump. -- Demonstrate that each AFW pump starts automatically on an actual or simulated actuation signal.	 [18] months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.4.5	Demonstrate that the required AFW flow paths from the condensate storage tank to the steam generator through one of the AFW trains deliver at least [750] gpm at [1270] psig or equivalent.	Prior to entering MODE 2, whenever unit has been in MODE 5 or 6 for > 30 days

3.7 PLANT SYSTEMS

3.7.5 Condensate Storage Tank (CST)

LCO 3.7.5 The CST level shall be within limits.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST level not within limits.	A.1 Restore CST level to within limits.	4 hours
	OR	
	A.2.1 Verify OPERABILITY of backup water supply.	4 hours AND Once per 12 hours thereafter
	AND	
	A.2.2 Restore CST level to within limits.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Actions and associated Completion Times not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	---------NOTE------- Only required if at least one residual heat removal loop is OPERABLE and in operation. -------------------	
		Be in MODE 4.	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify that the CST level is ≥ [ ] ft.	12 hours

3.7 PLANT SYSTEMS

3.7.6 Secondary Specific Activity

LCO 3.7.6 The specific activity of the secondary coolant shall be ≤ [0.10] μCi/gm DOSE EQUIVALENT I-131.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Demonstrate that the specific activity of the secondary coolant ≤ [0.10] μCi/gm DOSE EQUIVALENT I-131.	31 days

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4[, 5, and 6].

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	A.1 Restore CCW train to OPERABLE status.	72 hours
B. One CCW train inoperable.	B.1 Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support CCW train have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
C. One CCW train inoperable. AND One or more required support or supported features, inoperable associated with the other redundant CCW train.	C.1 Enter Required Actions of Condition D.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two CCW trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	D.1	Restore one CCW train to OPERABLE status.	Immediately
	AND		
	D.2	Be in MODE 3.	6 hours
	AND		
	D.3	Be in MODE 4.	12 hours
	AND		
	D.4	Be in MODE 5 only if one CCW train is OPERABLE.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify that each CCW manual, power-operated, and automatic valve in the flow path servicing safety-related equipment, that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
SR 3.7.7.2	Demonstrate that each CCW automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.7.7.3	Demonstrate that each CCW pump starts automatically on an actual or simulated actuation signal.	[18] months

3.7 PLANT SYSTEMS

3.7.8 Service Water System (SWS)

LCO 3.7.8 Twc SWS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SWS train inoperable.	A.1 Restore SWS train to OPERABLE status.	72 hours
B. One SWS train inoperable.	B.1 Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support SWS train have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
C. One SWS train inoperable. AND One or more required support or supported features inoperable associated with the other redundant SWS train.	C.1 Enter Required Actions of Condition D.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two SWS trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	D.1	Restore one SWS train to OPERABLE status.	Immediately
	AND		
	D.2	Be in MODE 3.	6 hours
	AND		
	D.3	Be in MODE 4.	12 hours
	AND		
	D.4	Be in MODE 5 only if one SWS train is OPERABLE.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that each SWS manual, power-operated, and automatic valve in the flow path servicing safety-related equipment, that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
SR 3.7.8.2	Demonstrate that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal.	[18] months
SR 3.7.8.3	Demonstrate that each SWS pump starts automatically on an actual or simulated actuation signal.	[18] months

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
[A. --------NOTE-------- Completion Time is on a Condition basis. ------------------- One or more cooling tower fans inoperable.	A.1	Verify at least [one] cooling tower fan in each cooling tower OPERABLE.	Immediately
	AND		
	A.2	Restore fans to OPERABLE status.	7 days]
B. UHS inoperable as established by Condition D.	B.1	Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support UHS have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]

(condition)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more cooling tower fans inoperable. AND One or more required support or supported features inoperable associated with the other redundant cooling tower fan.	C.1	Enter LCO 3.0.3, unless the loss-of-functional capability is allowed in the support or supported feature LCO.	Immediately
D. UHS inoperable [for reasons other than Condition A]. [OR Required Actions and associated Completion Times of Condition A not met.]	D.1 AND D.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify that the water level of the UHS is ≥ [562 ft] mean sea level.	24 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.9.2	Verify that the average water temperature of the UHS is ≤ [90]°F.	24 hours
[SR 3.7.9.3	Operate each cooling tower fan for ≥ [15] minutes.	31 days]

3.7 PLANT SYSTEMS

3.7.10 Fuel Storage Pool Water Level

LCO 3.7.10 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: When irradiated fuel assemblies are in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	------------NOTE------------ LCO 3.0.3 and LCO 3.0.4 are not applicable. ----------------------------	
A. Fuel storage pool water level not within limit.	A.1 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2 Initiate action to restore fuel storage pool water level.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days

13.7 PLANT SYSTEMS

3.7.11 Atmospheric Dump Valves (ADVs)

LCO 3.7.11 [Four] ADV lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

------------------------------NOTE------------------------------
For this LCO, all ADV lines are treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One ADV line inoperable.	A.1	--------NOTE-------- LCO 3.0.4 is not applicable. -------------------- Restore ADV line to OPERABLE status.	7 days
B. More than one ADV line inoperable.	B.1	Restore at least [three] ADV lines to OPERABLE status.	24 hours
C. Required Actions and associated Completion Times of Condition A or B not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Perform one complete cycle of each ADV.	[18] months
SR 3.7.11.2	Perform one complete cycle of each block valve.	[18] months

3.7 PLANT SYSTEMS

3.7.12 Control Room Emergency Filtration System (CREFS)

LCO 3.7.12 Two CREFS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREFS train inoperable.	A.1	Restore CREFS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time not met in MODE [5 or 6, or] during movement of irradiated fuel.	C.1	--------NOTE------- Place in emergency mode if auto-swapover to emergency mode inoperable. ------------------- Place OPERABLE CREFS train in emergency mode.	Immediately
	<u>OR</u>		
	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	C.2.2	Suspend positive reactivity additions.	Immediately
	<u>AND</u>		
	C.2.3	Suspend movement of irradiated fuel.	Immediately
D. Two CREFS trains inoperable in MODE [5 or 6, or] during movement of irradiated fuel.	D.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	D.2	Suspend positive reactivity additions.	Immediately
	<u>AND</u>		
	D.3	Suspend movement of irradiated fuel.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each CREFS train for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.7.12.2	Perform required CREFS filter testing in accordance with the [Ventilation Filter Testing Program].	In accordance with [Ventilation Filter Testing Program]
SR 3.7.12.3	Demonstrate that each CREFS train actuates on an actual or simulated actuation signal(s).	[18] months
SR 3.7.12.4	Demonstrate that one CREFS train can maintain a positive pressure of ≥ [0.125] inches water gauge, relative to the adjacent [turbine building] during the emergency radiation state of the emergency mode of operation at a recirculation flow rate of ≤ [35,700] cfm.	[18] months on a STAGGERED TEST BASIS
SR 3.7.12.5	Demonstrate that the system makeup flow rate is ≥ [270] and ≤ [300] cfm when supplying the control room with outside air.	[18] months

3.7 PLANT SYSTEMS

3.7.13 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.13 Two CREATCS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable.	A.1 Restore CREATCS train to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time not met in MODE [5 or 6 or] during movement of irradiated fuel.	C.1 Place OPERABLE CREATCS train in operation. OR C.2.1 Suspend CORE ALTERATIONS. AND	Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2.2	Suspend positive reactivity additions.	Immediately
	<u>AND</u>		
	C.2.3	Suspend movement of irradiated fuel.	Immediately
D. Two CREATCS trains inoperable in MODE [5 or 6 or] during movement of irradiated fuel.	D.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	D.2	Suspend positive reactivity additions.	Immediately
	<u>AND</u>		
	D.3	Suspend movement of irradiated fuel.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Verify that each train of the CREATCS has the capability of removing $\geq$ the required heat load.	[18] months

3.7 PLANT SYSTEMS

3.7.14 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.14 Two ECCS PREACS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECCS PREACS train inoperable.	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days
B. One ECCS PREACS train inoperable.	B.1 Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support ECCS PREACS train have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
C. One ECCS PREACS train inoperable. AND One or more required support or supported features inoperable associated with the other redundant ECCS PREACS train.	C.1 Enter LCO 3.0.3, unless the loss-of-functional capability is allowed in the support or supported feature LCO.	Immediately

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.14.1 Operate each ECCS PREACS train for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.7.14.2 Perform required ECCS PREACS filter testing in accordance with the [Ventilation Filter Testing Program].	In accordance with the [Ventilation Filter Testing Program]
SR 3.7.14.3 Demonstrate that each ECCS PREACS train actuates on an actual or simulated actuation signal.	[18] months
SR 3.7.14.4 Demonstrate that one ECCS PREACS train can maintain a negative pressure ≤ (more negative than) [-0.yy] inches water gauge relative to atmospheric pressure during the [post-accident] MODE of operation at a flow rate of ≤ [20,000] cfm.	[18] months on a STAGGERED TEST BASIS

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
[SR 3.7.14.5 Demonstrate that each ECCS PREACS filter bypass damper can be opened.	[18] months]

3.7 PLANT SYSTEMS

3.7.15 Fuel Building Air Cleanup System (FBACS)

LCO 3.7.15 Two trains shall be OPERABLE.

APPLICABILITY: [MODES 1, 2, 3, and 4,]
During movement of irradiated fuel in the fuel building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One FBACS train inoperable.	A.1 Restore FBACS train to OPERABLE status.	7 days
[B. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4. OR Two FBACS trains inoperable in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours]
C. Required Action and associated Completion Time not met during movement of irradiated fuel in the fuel building.	C.1 Place OPERABLE FBACS train in operation. OR C.2 Suspend movement of irradiated fuel in the fuel building.	Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two FBACS trains inoperable during movement of irradiated fuel in the fuel building.	D.1 Suspend movement of irradiated fuel in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Operate each FBACS train for [$\geq$ 10 continuous hours with the heaters operating or (for systems without heaters) $\geq$ 15 minutes].	31 days
SR 3.7.15.2	Perform required FBACS filter testing in accordance with the [Ventilation Filter Testing Program].	In accordance with the [Ventilation Filter Testing Program]
[SR 3.7.15.3	Demonstrate that each FBACS train actuates on an actual or simulated actuation signal.	[18] months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.15.4	Demonstrate that one FBACS train can maintain a negative pressure ≤ (more negative than) [-0.yy] inches water gauge with respect to atmospheric pressure during the [post-accident] MODE of operation at a flow rate ≤ [20,000] cfm.	[18] months
[SR 3.7.15.5	Demonstrate that each FBACS filter bypass damper can be opened.	[18] months]

3.7 PLANT SYSTEMS

3.7.16 Penetration Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.16 Two PREACS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One PREACS train inoperable.	A.1 Restore PREACS train to OPERABLE status.	7 days
B. One PREACS train inoperable.	B.1 Verify that the Required Actions for those supported systems declared inoperable by the inoperability of the support PREACS train have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]
C. One PREACS train inoperable. AND One or more required support or supported features inoperable associated with the other redundant PREACS train.	C.1 Enter LCO 3.0.3, unless the loss-of-functional capability is allowed in the support or supported feature LCO.	Immediately

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.16.1 Operate each PREACS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.7.16.2 Perform required PREACS filter testing in accordance with the [Ventilation Filter Testing Program].	In accordance with the [Ventilation Filter Testing Program]
[SR 3.7.16.3 Demonstrate that each PREACS train actuates on a simulated or actual actuation signal.	[18] months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
[SR 3.7.16.4 Demonstrate that one PREACS train can maintain a pressure ≤ (more negative than) [-0.yy] inches water gauge relative to atmospheric pressure during the [post-accident] MODE of operation at a flow rate of ≤ [ ] cfm.	[18] months on a STAGGERED TEST BASIS]
[SR 3.7.16.5 Demonstrate that each PREACS filter bypass damper can be opened.	[18] months]

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources—Operating

LCO 3.8.1 The required [Division 1] {VS-BW,CE,W,BWR/4: and [Division 2]} {VS-BWR/6: , [Division 2], and [Division 3]} AC electrical power sources shall be OPERABLE, and the required [Division 1] {VS-BW,CE,W,BWR/4: and [Division 2]} {VS-BWR/6: [,] [Division 2] [and Division 3]} [automatic sequencers] shall be OPERABLE.

APPLICABILITY: {VS-BW,CE,W: MODES 1, 2, 3, and 4.} {VS-GE: MODES 1, 2, and 3.}

-----------------------------NOTE-----------------------------
For this LCO, all required [Division 1] {VS-BW,CE,W,BWR/4: and [Division 2]} {VS-BWR/6: , [Division 2], and [Division 3]} AC electrical power sources and all required [Division 1] {VS-BW,CE,W,BWR/4: and [Division 2]} {VS-BWR/6: [,] [Division 2] [and Division 3]} [automatic sequencers] shall be treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE--------- Other offsite SRs: see SR 3.8.1.1. --------------------- One required offsite circuit inoperable.	A.1 Restore all required AC electrical power sources to OPERABLE status.	72 hours {VS-BWR/6: OR [72 hours] provided that the only offsite circuit that is inoperable is the [Division 3] offsite circuit}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. No offsite power source to one [division] of the onsite Class 1E Power Distribution System.	B.1	Restore all required AC electrical power sources to OPERABLE status.	[BX] hours
AND	OR		
One or more required support or supported features, inoperable that are associated with the other {VS-BW,CE,W, BWR/4: [division] that has} {VS-BWR/6: [divisions] that have} offsite power or associated with opposite OPERABLE DC power sub-system(s), or both.	{VS-BW,CE,W: B.2.1} {VS-GE: B.2}	Restore all required support and supported features to OPERABLE status that are associated with the other {VS-BW,CE,W,BWR/4: [division] that has} {VS-BWR/6: [divisions] that have} offsite power and opposite OPERABLE DC power subsystem(s).	[BX] hours
{VS-BW,CE,W:	AND		
OR			
The turbine-driven auxiliary feedwater pump inoperable.	B.2.2	--------NOTE-------- Required Action B.2.2 is required only in MODES 1, 2, and 3, and in MODE 4 when auxiliary feedwater is being used for plant shutdown or startup. -------------------- Restore turbine-driven auxiliary feedwater pump to OPERABLE status.	[BX] hours}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. --------NOTES-------- 1. Other offsite SRs: See SR 3.8.1.2. 2. Other onsite SRs: See SR 3.8.1.3. 3. Must complete SRs: SR 3.8.1.3 shall be completed if this Condition is entered. -------------------- One required diesel generator (DG) inoperable.	C.1	Restore all required AC electrical power sources to OPERABLE status.	72 hours {VS-BWR/6: OR [72 hours] provided that the only DG that is inoperable is the [Division 3] DG}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One required DG inoperable. AND One or more required support or supported features inoperable that are associated with the other {VS-BW,CE,W,BWR/4: [division] that has} {VS-BWR/6: [divisions] that have} a required OPERABLE DG or associated with opposite OPERABLE DC power sub-system(s), or both. {VS-BW,CE,W: OR The turbine-driven auxiliary feedwater pump inoperable.	D.1 Restore all required AC electrical power sources to OPERABLE status.	[DX] hours
	OR	
	{VS-BW, CE, W: D.2.1} {VS-GE: D.2} Restore all required support and supported features to OPERABLE status that are associated with the other {VS-BW,CE,W,BWR/4: [division] that has} {VS-BWR/6: [divisions] that have} a required OPERABLE DG or opposite OPERABLE DC power subsystem(s), or both.	[DX] hours
	AND	
	D.2.2 --------NOTE-------- Required Action D.2.2 is required in MODES 1, 2, and 3, and in MODE 4 when auxiliary feedwater is being used for plant shutdown or startup. -------------------- Restore turbine-driven auxiliary feedwater pump to OPERABLE status.	[DX] hours}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	-------------NOTE------------ When Condition E is entered with no AC power source to one [division], LCO 3.8.7 shall be immediately entered. ----------------------------	
E. One required offsite circuit inoperable.	E.1 Restore all required offsite circuits to OPERABLE status.	12 hours OR Within the Completion Time of Required Action A.1 of LCO 3.8.7, if Condition E was entered with no AC power source to one [division]
AND	OR	
One required DG inoperable.	E.2 Restore all required DGs to OPERABLE status.	12 hours OR Within the Completion Time of Required Action A.1 of LCO 3.8.7, if Condition E was entered with no AC power source to one [division]

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. Two required offsite circuits inoperable.	F.1	Restore at least {VS-BW,CE,W,BWR/4: [1]} {VS-BWR/6: 2} required offsite {VS-BW,CE,W,BWR/4: circuit[s]} {VS-BWR/6: circuits} to OPERABLE status.	24 hours
G. Two required DGs inoperable.	G.1	Restore at least {VS-BW,CE,W,BWR/4: [1] required DG[s]} {VS-BWR/6: 2 required DGs} to OPERABLE status.	2 hours
H. Three required AC sources inoperable.	H.1	Enter LCO 3.0.3.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One required [automatic load sequencer] inoperable.	I.1 Restore all required [automatic load sequencers] to OPERABLE status.	[2] hours {VS-BWR/6: [<u>OR</u> [2] hours if [automatic load sequencer] is associated with [Division 3]]}
J. Required Actions and Associated Completion Times of Condition A, B, C, D, E, F, G, or I not met.	J.1 Be in MODE 3. <u>AND</u> J.2 {VS-BW,CE,W: Be in MODE 5.} {VS-GE: Be in MODE 4.}	{VS-BW,CE,W: 6 hours} {VS-GE: 12 hours} 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	------------------NOTE------------------ SR 3.8.1.1 is only required when in Condition A. -- Perform the Surveillance of SR 3.8.1.4 for any remaining required offsite circuits that are OPERABLE.	Once within 1 hour of entering Condition A AND Once per 8 hours thereafter
SR 3.8.1.2	------------------NOTE------------------ SR 3.8.1.2 is only required when in Condition C. -- Perform the Surveillance of SR 3.8.1.4 for any required offsite circuits that are OPERABLE.	Once within 1 hour of entering Condition C AND Once per 8 hours thereafter

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	------------------NOTE------------------ SR 3.8.1.3 is only required when in Condition C. -- A.1 Determine absence of common cause for the DG inoperability for any remaining required DGs that are OPERABLE. OR B.1 Perform the Surveillance of SR 3.8.1.5 for any remaining required DGs that are OPERABLE.	Once within [8] hours of entering Condition C Once within [8] hours of entering Condition C
SR 3.8.1.4	Verify correct breaker alignment and indicated power availability for each required offsite circuit and OPERABILITY of devices providing the independence and separability.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	--------------------NOTES-------------------- 1. Performance of SR 3.8.1.17 satisfies this SR. 2. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. [3. Following DG start, warmup procedures such as idling and gradual acceleration may be used as recommended by the manufacturer. When they are not used, the time, voltage, and frequency tolerances specified in SR 3.8.1.17 must be met.] 4. Following this SR, satisfy SR 3.8.1.6. (Exceptions: Do not follow with SR 3.8.1.6 under the following circumstances: a. If SR 3.8.1.5 was required by SR 3.8.1.3, or b. If SR 3.8.1.5 was required by SR 3.8.2.1.) ---	
	Demonstrate each DG starts from standby conditions and achieves steady-state voltage and frequency within the ranges: a. [3744] V $\leq$ voltage $\leq$ [4576] V; and b. [58.8] Hz $\leq$ frequency $\leq$ [61.2] Hz.	As specified by Table 3.8.1-1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.6	-------------------NOTES------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This surveillance shall be conducted on only one DG at a time. --- Demonstrate each DG is synchronized and loaded and operates for ≥ 60 minutes at a load within the range: [4500]kW ≤ load ≤ [5000]kW for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [2970]kW ≤ load ≤ [3300]kW for [Division 3] DG,} and at a power factor within the range: [0.8] ≤ power factor ≤ [0.90] for [Division 1 and 2] DGs {VS-BWR/6: and within the range: [0.8] ≤ power factor ≤ [0.90] for [Division 3] DG}.	As specified by Table 3.8.1-1
SR 3.8.1.7	Verify pressure in required air-start receivers ≥ [160] psig for [Division 1 and 2] {VS-BWR/6: and ≥ [150] psig for [Division 3]}.	31 days
SR 3.8.1.8	Verify each fuel day tank [and engine-mounted fuel tank] contains ≥ [220] gal of fuel for [Division 1 and 2] {VS-BWR/6: and ≥ [200] gal for [Division 3]}.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	{VS-BW,CE,W,BWR/4: Verify each fuel storage tank contains ≥ [60,000] gal of fuel.} {VS-BWR/6: Verify each fuel storage tank contains: a. ≥ [60,000] gal of fuel for [Division 1 and 2] DGs; and b. ≥ [40,000] gal of fuel for [Division 3] DG.}	31 days
SR 3.8.1.10	Verify lubricating oil inventory is ≥ [500] gal.	31 days
SR 3.8.1.11	Demonstrate the flash point, gravity, viscosity, and appearance of new fuel are within limits when tested in accordance with applicable American Society for Testing Materials (ASTM) standards.	Once within 31 days prior to addition of new fuel to storage tank(s)
SR 3.8.1.12	Demonstrate that the properties of new fuel, other than those listed in SR 3.8.1.11, are within applicable ASTM limits.	Once within 31 days following performance of SR 3.8.1.11
SR 3.8.1.13	Demonstrate that the total particulate in stored fuel is less than 10 mg/l when tested in accordance with applicable ASTM standards.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	Check for and remove accumulated water from each storage tank.	[31] days
SR 3.8.1.15	Check for and remove accumulated water from each day tank [and engine-mounted tank].	[31] days
SR 3.8.1.16	Demonstrate the fuel transfer system operates to [automatically] transfer fuel from storage tank(s) to the day tank [and engine-mounted tank].	[92] days
SR 3.8.1.17	-------------------NOTES------------------- 1. All DG starts may be preceded by an engine prelube period. 2. Following this SR (except when required by SR 3.8.2.1), perform SR 3.8.1.6. --- Demonstrate each DG starts from standby condition and achieves in ≤ [10] seconds, voltage and frequency within the ranges: a. [3744] V ≤ voltage ≤ [4576] V; and b. [58.8] Hz ≤ frequency ≤ [61.2] Hz.	184 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
[SR 3.8.1.18	----------------NOTES---------------- 1. This Surveillance shall not be performed in MODE 1 or 2. 2. Credit may be taken for unplanned events that satisfy this SR. -- Demonstrate [automatic/manual] transfer of [safety-related power supply] from the [normal circuit to each required offsite circuit and between the required] offsite circuits.	[18 months]]

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	--------------------NOTES------------------ 1. This Surveillance shall not be performed in MODE 1 or 2. 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate each DG operating at a power factor within the range: [0.80] ≤ power factor ≤ [0.90] for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [0.80] ≤ power factor ≤ [0.90] for [Division 3] DG,} rejects a load ≥ [1200]kW for [Division 1 and 2] DGs, {VS-BWR/6: and rejects a load ≥ [2500]kW for [Division 3] DG, and: a. Following load rejection, the frequency is ≤ [63] Hz; and b. Within [3] seconds following load rejection, the voltage is within the range: [3744] V ≤ voltage ≤ [4576] V; and c. Within [3] seconds following load rejection, the frequency is within the range: [58.8] Hz ≤ frequency ≤ [61.2] Hz.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.20	-------------------NOTES------------------- 1. This Surveillance shall not be performed in MODE 1 or 2. 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate each DG, operating at a power factor within the range: [0.8] ≤ power factor ≤ [0.9] for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [0.8] ≤ power factor ≤ [0.9] for [Division 3] DG,} does not trip and voltage is maintained ≤ [5000] V during and following a load rejection of a load within the range: [4500]kW ≤ load ≤ [5000]kW for [Division 1 and 2] DGs {VS-BWR/6: and within the range: [2970]kW ≤ load ≤ [3300]kW for [Division 3] DG}.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.21	-----------------NOTES--------------------- 1. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. 2. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 3. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ [10] seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer; 3. maintains steady-state voltage in the range: [3744] V ≤ voltage ≤ [4576] V; 4. maintains steady-state frequency in the range: [58.8] Hz ≤ frequency ≤ [61.2] Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ [5] minutes.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.22	-------------------NOTES------------------- 1. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. 2. This Surveillance shall not be performed in MODE 1 or 2. 3. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate on an actual or simulated [Engineered Safety Feature (ESF)] signal each DG auto-starts from standby condition and: a. In ≤ [10] seconds after auto-start and during tests, achieves voltage in the range: [3744] V ≤ voltage ≤ [4576] V; b. In ≤ [10] seconds after auto-start and during tests, achieves Frequency in the range: [58.8] Hz ≤ Frequency ≤ [61.2] Hz, c. Operates for ≥ [5] minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized [or auto-connected through the automatic load sequencer] to the offsite power system.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.23	-------------------NOTES------------------- 1. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated [ESF] actuation signal] except: a. Engine overspeed; b. Generator differential current; c. [Low lube oil pressure]; d. [High crankcase pressure]; and e. [Start failure relay].	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.24	------------------NOTES------------------ 1. Momentary transients outside the load range do not invalidate this test. 2. This Surveillance shall not be performed in MODE 1 or 2. 3. Credit may be taken for unplanned events that satisfy this SR. --	
	Demonstrate each DG operating at a power factor within the range: [0.8] ≤ power factor ≤ [0.9] for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [0.8] ≤ power factor ≤ [0.9] for [Division 3] DG,} operates for ≥ 24 hours: a. During the first 2 hours loaded within the range: [5250]kW ≤ load ≤ [5,500]kW for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [3465]kW ≤ load ≤ [3630]kW for [Division 3] DG,}; and b. During the remaining 22 hours of the test loaded within the range: [4500]kW ≤ load ≤ [5000]kW for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [2970]kW ≤ load ≤ [3300]kW for [Division 3] DG}.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.25 ---------------------NOTES-------------------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours at a power factor in the range: [0.8] ≤ power factor ≤ [0.9] for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [0.8] ≤ power factor ≤ [0.9] for [Division 3] DG,} and at a load in the range: [4500]kW ≤ load ≤ [5000]kW for [Division 1 and 2] DGs, {VS-BWR/6: and within the range: [2970]kW ≤ load ≤ [3300]kW for [Division 3] DG}. 2. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. 3. Momentary transients outside of load range do not invalidate this test. --	
Demonstrate each DG starts and achieves in ≤ [10] seconds, voltage and frequency within the ranges: a. [3744] V ≤ voltage ≤ [4576] V; and b. [58.8] Hz ≤ frequency ≤ [61.2] Hz.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.26	---------------------NOTES-------------------- 1. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	[18 months]
SR 3.8.1.27	-----------------NOTES----------------- 1. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate with a DG operating in test mode and connected to its bus, an actual or simulated [ESF] actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation [; and] [b. Automatically energizing the emergency load with offsite power].	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.28	--------------------NOTES-------------------- 1. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 2. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate the interval between each load block is within ± [10% of design interval] for each emergency [and shutdown] load sequencer.	[18 months]
SR 3.8.1.29	--------------------NOTES-------------------- 1. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. 2. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 3. Credit may be taken for unplanned events that satisfy this SR. --- Demonstrate on an actual or simulated [ESF] actuation signal with delayed loss of offsite power: a. Each DG auto-starts from standby conditions and: 1. achieves in ≤ [10] seconds after auto-start and during test, voltage within the range: [3744] V ≤ voltage ≤ [4576] V,	[36 months] alternated with SR 3.8.1.30

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.29 (continued) 2. achieves in ≤ [10] seconds after auto-start and during test, frequency within the range: [58.8] Hz ≤ frequency ≤ [61.2] Hz; b. Permanently connected loads remain energized from the offsite power system; and c. Emergency loads are energized [or auto-connected through the load sequencer] to the offsite power system. Before the last load step, simulate loss of offsite power and demonstrate: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG from ready-to-load condition: 1. energizes permanently connected loads, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady-state voltage within the range: [3744] V ≤ voltage ≤ [4576] V, 4. achieves steady-state frequency within the range: [58.8] Hz ≤ frequency ≤ [61.2] Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.30 -------------------NOTES------------------ 1. All DG starts may be preceded by prelube procedures as recommended by the manufacturer. 2. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4.} {VS-GE: MODE 1, 2, or 3.} 3. Credit may be taken for unplanned events that satisfy this SR. -- Demonstrate on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated [ESF] actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ [10] seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady-state voltage within the range: [3744] V ≤ voltage ≤ [4576] V, 4. achieves steady-state frequency within the range: [58.8] Hz ≤ frequency ≤ [61.2] Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ [5] minutes.	[36 months] alternated with SR 3.8.1.29

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.31	For the fuel subsystem: a. Drain each fuel storage tank; b. Remove the sediment from the storage tank; and c. Clean the storage tank.	10 years
SR 3.8.1.32	-------------------NOTE-------------------- All DG starts may be preceded by prelube procedures as recommended by the manufacturer. --- Demonstrate that when started simultaneously from standby condition, the {VS-BW, CE, W, BWR/4: [Division 1 and 2]} {VS-BWR/6: [Division 1, 2, and 3]} DGs each achieve in ≤ [10] seconds voltage and frequency within the range: a. [3744] V ≤ voltage ≤ [4576] V; and b. [58.8] Hz ≤ frequency ≤ [61.2] Hz.	10 years

Table 3.8.1-1 (Page 1 of 1)
Diesel Generator Test Schedule

NUMBER OF FAILURES IN LAST 25 VALID TESTS[a]	FREQUENCY
≤ 3	31 days
≥ 4	7 days[b] (but no less than 24 hours)

a. Criteria for determining number of failures and valid demands shall be in accordance with Regulatory Position C.2.1 of Regulatory Guide 1.9, Revision 3, where the number of demands and failures is determined on a per DG basis.

b. This test frequency shall be maintained until seven consecutive failure-free starts from standby conditions and load-run demands have been performed. This is consistent with Regulatory Position [ ], of Regulatory Guide 1.9, Revision 3. If subsequent to the seven failure-free tests one or more additional failures occur such that there are again four or more failures in the last 25 tests, the testing interval shall again be reduced as noted above and maintained until seven consecutive failure-free tests have been performed.

[Note: If Revision 3 of Regulatory Guide 1.9 is not approved, the above table will be modified to be consistent with the existing version of Regulatory Guide 1.108.]

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources—Shutdown

LCO 3.8.2 The following required AC electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.a;

b. One diesel generator (DG) capable of supplying the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.a;

c. When redundant loads are required to be OPERABLE, a third separate and independent, readily available AC electrical power source (offsite circuit or DG) capable of supplying the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.b. {VS-GE: This third readily available AC source is always required in MODE 4.} {VS-BWR/6: ; and

d. When [the High Pressure Core Spray (HPCS) System is required to be OPERABLE, or other loads assigned to the HPCS System [division] are required to be OPERABLE, or both], one circuit between the offsite transmission network and [Division 3] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.c.}

The following required [automatic sequencers] shall be OPERABLE:

a. The [Division 1 or 2] [automatic sequencer] associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.a;

b. When redundant loads are required to be OPERABLE, the other [Division 2 or 1] [automatic sequencer] associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.b. {VS-GE: This other [Division 2 or 1] [automatic sequencer] is always required in MODE 4.} {VS-BWR/6: ; and

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LCO 3.8.2 (continued)

c. When [the HPCS System is required to be OPERABLE, or other loads assigned to the HPCS System [division] are required to be OPERABLE, or both], the [Division 3] [automatic sequencer] associated with the onsite Class 1E power distribution subsystem of LCO 3.8.8.c].}

APPLICABILITY: {VS-BW,CE,W: MODES 5 and 6} {VS GE: MODES 4 and 5}, When handling irradiated fuel {VS-GE: [, When moving loads over irradiated fuel in the primary or secondary containment]}.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC electrical power sources inoperable.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend handling of irradiated fuel {VS-GE: [, or moving loads over irradiated fuel in the primary or secondary containment]}.	Immediately
	AND	
	A.3 Suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.4	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.5	Initiate action to restore required AC electrical power sources to OPERABLE status.	Immediately
	AND		
	A.6	--------NOTE-------- This Required Action applies when there is no AC power source to one or more [divisions] of the onsite Class 1E Power Distribution System. --------------------	
		Initiate action to verify that the Required Actions for those supported systems declared inoperable by the total loss of power to a power distribution subsystem have been initiated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	For all equipment required to be OPERABLE the following SRs are required to be met: SR 3.8.1.4, SR 3.8.1.10, SR 3.8.1.15, SR 3.8.1.5, SR 3.8.1.11, SR 3.8.1.16, SR 3.8.1.7, SR 3.8.1.12, SR 3.8.1.17, SR 3.8.1.8, SR 3.8.1.13, SR 3.8.1.21, SR 3.8.1.9, SR 3.8.1.14, SR 3.8.1.28, SR 3.8.1.31.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 DC Sources—Operating

LCO 3.8.3 The required [Division 1]
{VS-BW,CE,W,BWR/4: and [Division 2]}
{VS-BWR/6: , [Division 2], and [Division 3]}
DC power subsystems shall be OPERABLE.

APPLICABILITY: {VS-BW,CE,W: MODES 1, 2, 3, and 4.}
{VS-GE: MODES 1, 2, and 3.}

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required DC electrical power subsystem inoperable.	A.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours {VS-BWR/6: OR [2 hours] if [Division 3] DC electrical power subsystem is the inoperable [division]}
	AND	
	A.2 Verify the Required Actions for those supported systems declared inoperable by the inoperability of one [division] DC electrical power subsystem have been initiated.	2 hours {VS-BWR/6: OR [2 hours] if [Division 3] DC electrical power subsystem is the inoperable [division]}

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two {VS-BWR/6: or more} required DC electrical power subsystems inoperable.	B.1	Enter LCO 3.0.3.	Immediately
C. One [division] DC electrical power subsystem inoperable. AND One or more required support or supported features inoperable associated with the other OPERABLE [divisions] of DC electrical power subsystems, or with opposite OPERABLE AC and DC electrical power distribution subsystems, or both.	C.1	Enter LCO 3.0.3, unless the loss of functional capability is allowed in the support or supported feature LCO.	Immediately
D. Required Actions and Associated Completion Times of Condition A not met.	D.1	Be in MODE 3.	{VS,BW,CE,W: 6 hours} {VS-GE: 12 hours}
	AND		
	D.2	{VS-BW,CE,W: Be in MODE 5.} {VS-GE: Be in MODE 4.}	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	A.1 Verify battery cell parameters meet Table 3.8.3-1 Category A limits. OR B.1.1 Verify pilot cells' electrolyte level and float voltage meet Table 3.8.3-1 Category C allowable values.	7 days Once within 1 hour of Category A parameters found outside limits
	AND B.1.2 Verify battery cell parameters meet Table 3.8.3-1 Category C allowable values.	Once within 24 hours of Category A parameters found outside limits
	AND B.1.3 Verify battery cell parameters have been restored to Category A and B limits of Table 3.8.3-1.	Once within 31 days of Category A parameters found outside limits
SR 3.8.3.2	Verify battery terminal voltage is ≥ [258/129] V on float charge.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.3.3	A.1 Verify battery cell parameters meet Table 3.8.3-1 Category B limits.	92 days AND Once within 24 hours after a battery discharge below [110] V AND Once within 24 hours after a battery overcharge above [150] V
	OR	
	B.1.1 Verify pilot cells' electrolyte level and float voltage meet Table 3.8.3-1 Category C allowable values.	Once within 1 hour of Category B parameters found outside limits
	AND	
	B.1.2 Verify battery cell parameters meet Table 3.8.3-1 Category C allowable values.	Once within 24 hours of Category B parameters found outside limits
	AND	
	B.1.3 Verify battery cell parameters have been restored to Category A and B limits of Table 3.8.3-1.	Once within 31 days of Category B parameters found outside limits

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.3.4	Verify average electrolyte temperature of representative cells is ≥ [60]°F.	92 days
SR 3.8.3.5	Verify no visible corrosion at terminals and connectors. OR Verify connection resistance [of these items is ≤ [10 x 10^{-6} ohms] for inter-cell connections, ≤ [10 x 10^{-6} ohms] for inter-rack connections, ≤ [10 x 10^{-6} ohms] for inter-tier connections, and ≤ [10 x 10^{-6} ohms] for terminal connections].	92 days
SR 3.8.3.6	Verify cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration.	12 months
SR 3.8.3.7	Verify cell-to-cell and terminal connections are clean, tight, free of visible corrosion, and coated with anti-corrosion material.	12 months
SR 3.8.3.8	Verify connection resistance [of these items is ≤ [10 x 10^{-6} ohms] for inter-cell connections, ≤ [10 x 10^{-6} ohms] for inter-rack connections, ≤ [10 x 10^{-6} ohms] for inter-tier connections, and ≤ [10 x 10^{-6} ohms] for terminal connections].	12 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.3.9	------------------NOTE------------------ This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4} {VS-GE: MODE 1, 2, or 3}. --- Demonstrate each battery charger will supply ≥ [400] amps at ≥ [250/125] V for ≥ [8] hours.	[18 months]
SR 3.8.3.10	------------------NOTES------------------ 1. SR 3.8.3.11 may be performed in lieu of SR 3.8.3.10 once per 60 months. 2. This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4} {VS-GE: MODE 1, 2, or 3}. --- Demonstrate battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery-service test.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.3.11	------------------NOTES------------------ This Surveillance shall not be performed in {VS-BW,CE,W: MODE 1, 2, 3, or 4} {VS-GE: MODE 1, 2, or 3}. -- Demonstrate battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test.	60 months <u>AND</u> Once within 24 months after new battery installation <u>AND</u> -----NOTE----- Only applicable when battery shows degradation or has reached [85%] of the expected life ------------- 12 months

Table 3.8.3-1 (Page 1 of 1)

Battery Cell Parameter Requirements

	CATEGORY A	CATEGORY B	CATEGORY C
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable Value for each connected cell
Electrolyte Level	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark[a]	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark[a]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[b]	≥ [1.200][c]	≥ [1.195] <u>AND</u> Average of all connected cells > [1.205]	Not more than 0.020 below average of all connected cells <u>AND</u> Average of all connected cells ≥ [1.195][c]

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

b. Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < [2] amps when on float charge.

c. Or battery charging current is < [2] amps when on float charge. This is acceptable only during a maximum of [7 days] following a battery recharge.

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Shutdown

LCO 3.8.4 The following required DC sources shall be OPERABLE:

a. The [Division 1 or 2] DC electrical power subsystem associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.a; and

b. When redundant loads are required to be OPERABLE, the other [Division 2 or 1] DC electrical power subsystem associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.b. {VS-GE: This other [Division 2 or 1] DC electrical power subsystem is always required in MODE 4.} {VS-BWR/6: ; and

c. When [the High Pressure Core Spray (HPCS) System is required to be OPERABLE, or other loads assigned to the HPCS System [division] are required to be OPERABLE, or both], the [Division 3] DC electrical power subsystem associated with the onsite Class 1E power distribution subsystem of LCO 3.8.8.c.}

APPLICABILITY: {VS-BW,CE,W: MODES 5 and 6} {VS-GE: MODES 4 and 5}, When handling irradiated fuel {VS-GE: [, When moving loads over irradiated fuel in the primary or secondary containment]}.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required DC electrical power subsystems inoperable.	A.1 Suspend CORE ALTERATIONS. AND	Immediately

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	For all equipment required to be OPERABLE the following SRs are required to be met: SR 3.8.3.1 SR 3.8.3.5 SR 3.8.3.9 SR 3.8.3.2 SR 3.8.3.6 SR 3.8.3.10 SR 3.8.3.3 SR 3.8.3.7 SR 3.8.3.11 SR 3.8.3.4 SR 3.8.3.8	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 Inverters—Operating

LCO 3.8.5 The required [Division 1]
{VS-BW,CE,W,BWR/4: and [Division 2]}
{VS-BWR/6: , [Division 2], and [Division 3]}
inverters shall be OPERABLE.

---------------------------NOTES---------------------------
[Two] inverters may be disconnected [from their associated DC buses] for ≤ 24 hours to perform an equalizing charge [on associated battery banks] providing:

1. Associated AC vital buses are energized from their [Class 1E] constant voltage source transformer; and

2. AC vital buses for other battery banks are energized from their associated inverters connected to their DC buses.

APPLICABILITY: {VS-BW,CE,W: MODES 1, 2, 3, and 4.}
{VS-GE: MODES 1, 2, and 3.}

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required inverter inoperable.	A.1	Power AC vital bus from its [Class 1E] constant voltage source transformer.	2 hours {VS-BWR/6: <u>OR</u> [2 hours if [Division 3] inverter is the inoperable inverter}
	<u>AND</u>		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	Restore required inverter to OPERABLE status.	24 hours {VS-BWR/6: OR [24 hours] if [Division 3] inverter is the inoperable inverter}
	AND A.3	Power AC vital bus from its associated inverter and DC bus.	24 hours {VS-BWR/6: OR [24 hours] if [Division 3] inverter is the inoperable inverter}
	AND A.4	Verify the Required Actions for those supported systems declared inoperable by the inoperability of 1 inverter have been initiated.	2 hours {VS-BWR/6: OR [2 hours] if [Division 3] inverter is the inoperable inverter}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required inverter inoperable. AND One or more required support or supported features inoperable associated with the other OPERABLE inverters, or with opposite OPERABLE AC and DC electrical power distribution subsystems, or with opposite OPERABLE DC electrical power subsystems, or all three.	B.1 Enter LCO 3.0.3, unless the loss of functional capability is allowed in the support or supported feature LCO.	Immediately
C. Required Actions and associated Completion Times not met.	C.1 Be in MODE 3. AND C.2 {VS-BW,CE,W: Be in MODE 5.} {VS-GE: Be in MODE 4.}	{VS-BW,CE,W: 6 hours} {VS-GE: 12 hours} 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	Verify correct inverter voltage, frequency, and alignment to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Inverters—Shutdown

LCO 3.8.6 The following required inverters shall be OPERABLE:

a. The [Division 1 or 2] inverters associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.a; and

b. When redundant loads are required to be OPERABLE, the other [Division 2 or 1] inverters associated with the one [division] of the onsite Class 1E power distribution subsystem of LCO 3.8.8.b. {VS-GE: These other [Division 2 or 1] inverters are always required in MODE 4.} {VS-BWR/6: ; and

c. When [the High Pressure Core Spray (HPCS) System is required to be OPERABLE, or other loads assigned to the HPCS System [division] are required to be OPERABLE, or both], the [Division 3] inverters associated with the onsite Class 1E power distribution subsystem of LCO 3.8.8.c.}

APPLICABILITY:
{VS-BW,CE,W: MODES 5 and 6} {VS-GE: MODES 4 and 5},
When handling irradiated fuel
{VS-GE: [, Moving loads over irradiated fuel in the primary or secondary containment]}.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required inverters inoperable.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend handling of irradiated fuel {VS-GE: [and moving loads over irradiated fuel in the primary or secondary containment]}.	Immediately
	AND		
	A.3	Suspend operations with a potential for draining the reactor vessel.	Immediately
	AND		
	A.4	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.5	Initiate action to restore required inverters to OPERABLE status.	Immediately
	AND		
	A.6	Initiate action to verify the Required Actions for those supported systems declared inoperable by the inoperability of 1 or more inverters have been initiated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify correct inverter voltage, frequency, and alignments to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 The required [Division 1] {VS-BW,CE,W,BWR/4: and [Division 2]} {VS-BWR/6: , [Division 2], and [Division 3]} AC and DC electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: {VS-BW,CE,W: MODES 1, 2, 3, and 4.}
{VS-GE: MODES 1, 2, and 3.}

---------------------------NOTE---------------------------
For this LCO, all required [divisions] of AC and DC electrical power distribution subsystems shall be treated as an entity with a single Completion Time.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC buses, load centers, motor control centers, or distribution panels, except AC vital buses, in one [division's] AC and DC electrical power distribution subsystem inoperable.	A.1 Restore all required AC and DC electrical power distribution subsystems to OPERABLE status.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems Required Actions; furthermore, [ ] is not to exceed 8 hours if more than 2 systems are made inoperable because of the distribution system inoperability]

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required AC vital bus inoperable.	B.1	Restore all required AC and DC electrical power distribution subsystems to OPERABLE status.	2 hours {VS-BWR/6: OR [2 hours] if [Division 3] DC electrical power subsystem is the inoperable [division]}
C. One or more required DC buses inoperable in one [division's] AC and DC electrical power distribution subsystem.	C.1	Restore all required AC and DC electrical power distribution subsystems to OPERABLE status.	2 hours {VS-BWR/6: OR [2 hours] if [Division 3] DC electrical power subsystem is the inoperable [division]}

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more features specified under Condition A, B, or C inoperable in one [division] of the AC and DC electrical power distribution subsystem. AND One or more required support or supported features inoperable associated with the other OPERABLE AC and DC electrical power distribution subsystems, or with opposite OPERABLE DC electrical power subsystems, or both.	D.1	Enter LCO 3.0.3, unless the loss of functional capability is allowed in the support or supported feature LCO.	Immediately
E. One or more features specified under Condition A, B, or C inoperable in one [division] of the AC and DC electrical power distribution subsystem.	E.1	Verify the Required Actions for those supported systems declared inoperable by the support features governed by this LCO have been initiated.	[ ] hours, [where [ ] hours is the most limiting Completion Time of all the supported systems' Required Actions]

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Actions and associated Completion Times not met.	F.1 Be in MODE 3. AND F.2 {VS-BW,CE,W: Be in MODE 5.} {VS-GE: Be in MODE 4.}	{VS-BW,CE,W: 6 hours} {VS-GE: 12 hours} 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	7 days
[SR ^.8.7.2	Verify correct AC vital bus frequency.	7 days]

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems—Shutdown

LCO 3.8.8 The following required AC and DC electrical power distribution subsystems shall be OPERABLE:

a. One [Division 1 or 2] AC and DC electrical power distribution subsystem identified in Table B 3.8.7-1. All required OPERABLE loads shall be powered from this [Division 1 or 2], except for redundant counterpart loads (See b below); and

b. When redundant counterpart loads are required to be OPERABLE, the [necessary portions of the] other [Division 2 or 1] identified in Table B 3.8.7-1 AC and DC electrical power distribution subsystem. {VS-GE: [The necessary portions of] this other [Division 2 or 1] AC and DC electrical power distribution subsystem is always required in MODE 4.} {VS-BWR/6:, and

c. When [the High Pressure Core Spray (HPCS) System is required to be OPERABLE, or other loads assigned to the HPCS System [division] are required to be OPERABLE, or both], the [Division 3] AC and DC electrical power distribution subsystem identified in Table B 3.8.7-1.}

APPLICABILITY: {VS-BW,CE,W: MODES 5 and 6} {VS-GE: MODES 4 and 5}, When handling irradiated fuel {VS-GE: [, Moving loads over irradiated fuel in the primary or secondary containment]}.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required AC and DC electrical power distribution subsystems inoperable.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend handling of irradiated fuel {VS-GE: [and moving loads over irradiated fuel in the primary or secondary containment]}.	Immediately
	AND		
	A.3	Suspend operations with a potential for draining the reactor vessel.	Immediately
	AND		
	A.4	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.5	Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status.	Immediately
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.6	Initiate action to verify the Required Actions for those supported systems declared inoperable by the inoperability of 1 or more AC and DC electrical power distribution subsystems have been initiated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	7 days
[SR 3.8.8.2	Verify correct AC vital bus frequency.	7 days]

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of the Reactor Coolant System (RCS), the refueling canal, and the refueling cavity shall be maintained within the limit specified in the CORE OPERATING LIMITS REPORT (COLR).

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Boron concentration not within limit.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend positive reactivity additions.	Immediately
	AND		
	A.3	Initiate actions to restore boron concentration to within limits.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify that boron concentrations are within limits.	72 hours

3.9 REFUELING OPERATIONS

3.9.2 Unborated Water Source Isolation Valves

LCO 3.9.2 Each valve used to isolate unborated water sources shall be secured in the closed position.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTES------- 1. Required Action A.3 must be completed whenever Condition A is entered. 2. Each unborated water source isolation valve is treated as an independent entity for this LCO, with an independent Completion Time. --------------------- One or more valves not secured in closed position.	A.1 Suspend CORE ALTERATIONS. AND A.2 Initiate actions to secure valves(s) in closed position. AND A.3 Perform SR 3.9.1.1, "Boron Concentration."	Immediately Immediately 4 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.2.1	Verify that each valve that isolates unborated water sources is secured in the closed position.	31 days

3.9 REFUELING OPERATIONS

3.9.3 Nuclear Instrumentation

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

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required source range neutron flux monitor inoperable.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend positive reactivity additions.	Immediately
	AND		
	A.3	Initiate actions to restore source range neutron flux monitor to OPERABLE status.	7 days
B. Two required source range neutron flux monitors inoperable.	B.1	Initiate actions to restore one source r~ ~e neutron flux ~ ~or to OPERABLE ~ ~us.	15 minutes
	AND		
	B.2	Perform SR 3.9.1.1, "Boron Concentration."	4 hours AND Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.3.1 Perform a CHANNEL CHECK.	12 hours
SR 3.9.3.2 Perform ANALOG CHANNEL OPERATIONAL TEST.	7 days

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

LCO 3.9.4 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by [four] bolts;

b. One door in each airlock closed; and

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

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

2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2 Suspend movement of fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	V fy that each required containment ding penetration is in its required status.	7 days
SR 3.9.4.2	Demonstrate that each required containment purge and exhaust valve actuates to its isolation position on an actual or simulated actuation signal[s].	[18] months

3.9 REFUELING OPERATIONS

3.9.5 Residual Heat Removal (RHR) and Coolant Circulation—High Water Level

LCO 3.9.5 One RHR loop shall be OPERABLE and in operation.

----------------------------NOTE----------------------------
The required RHR loop may be removed from operation for ≤ 1 hour per 2-hour period, provided:

No operations are permitted that would cause dilution of the Reactor Coolant System boron concentration.

APPLICABILITY: MODE 6 with the water level ≥ 23 ft above the top of reactor vessel flange.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RHR loop requirements not met.	A.1	Verify operations to ensure that there is no reduction in reactor coolant boron concentration.	Immediately
	AND		
	A.2	Suspend operations involving an increase in reactor decay heat load.	Immediately
	AND		
	A.3	Initiate action to satisfy RHR loop requirements.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify that one RHR loop is OPERABLE, in operation, and circulating reactor coolant.	12 hours

3.9 REFUELING OPERATIONS

3.9.6 Residual Heat Removal (RHR) and Coolant Circulation—Low Water Level

LCO 3.9.6 Two RHR loops shall be OPERABLE and one RHR loop shall be in operation.

APPLICABILITY: MODE 6 with the water level < 23 ft above the top of reactor vessel flange.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RHR loop inoperable or not in operation.	A.1	Initiate action to restore RHR loop to OPERABLE status and to operation.	15 minutes
	OR		
	A.2	Initiate actions to establish ≥ 23 ft of water above the top of reactor vessel flange while maintaining the correct boron concentration.	15 minutes
B. No RHR loop OPERABLE or in operation.	B.1	Verify operations to ensure that there is no reduction in reactor coolant boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore one RHR loop to OPERABLE status and to operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify that one RHR loop is OPERABLE, in operation, and circulating reactor coolant, and that the other RHR loop is OPERABLE.	12 hours

3.9 REFUELING OPERATIONS

3.9.7 Refueling Cavity Water Level

LCO 3.9.7 Refueling cavity water level shall be maintained $\geq$ 23 ft above the top of reactor vessel flange.

APPLICABILITY: During movement of fuel assemblies within containment with irradiated fuel in containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Refueling cavity water level not within limit.	A.1	Suspend movement of fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify that refueling cavity water level is $\geq$ 23 ft above the top of reactor vessel flange.	24 hours

4.0 DESIGN FEATURES

4.1 SITE

4.1.1 Site and Exclusion Boundaries

The site and exclusion boundaries shall be as shown in Figure 4.1-1.

4.1.2 Low Population Zone

The low population zone shall be as shown in Figure 4.1-2.

4.2 REACTOR CORE

4.2.1 Fuel Assemblies

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

4.2.2 [Control Rod] Assemblies

The reactor core shall contain [number and type] [control rod] assembly. The control material shall be [silver-indium-cadmium, boron carbide, or hafnium metal] as approved by the NRC.

(continued)

This figure for illustration only. Do not use for operation.

[Figure to be included in plant-specific TS for that facility.]

This figure shall consist of a map of the site area and provide, as a minimum, the information described in Section [2.1.2] of the FSAR relating to the map.

Figure 4.1-1 (Sheet 1 of 1)
Site and Exclusion Area Boundaries

This figure for illustration only. Do not use for operation.

[Figure to be included in plant-specific TS for that facility.]

This figure shall consist of a map of the site area showing the low population zone boundary. Features such as towns, roads, and recreational areas shall be indicated in sufficient detail to allow identification of significant shifts in population distribution within the low population zone.

Figure 4.1-2 (Sheet 1 of 1)
Low Population Zone

4.3 FUEL STORAGE

4.3.1 Criticality

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

a. Fuel assemblies having a maximum uranium-235 enrichment of [ ] weight percent, [burnup limits,] and a $K_{eff} \leq 0.95$ when flooded with unborated water, which includes an allowance for uncertainties as described in Section [9.1] of the FSAR;

b. A nominal [6.5] inch center-to-center distance between fuel assemblies placed in the storage racks; and

c. A minimum boron concentration of [ ] ppm, which shall be verified [weekly].

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

a. Fuel assemblies having a maximum uranium-235 enrichment of [ ] weight percent and a K_{eff} [≤ 0.95 when moderated with unborated water and] [≤ 0.98 when moderated by aqueous foam or means to prevent aqueous foam entry], [both of] which include an allowance for uncertainties as described in [Section 9.1 of the FSAR]; and

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

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation [ ].

4.3.3 Capacity

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

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

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

5.1.2 The [Shift Supervisor] shall be responsible for the control room command function. A management directive to this effect, signed by the [highest level of corporate management] shall be reissued to all station personnel on an annual basis. During any absence of the Shift Supervisor from the control room while the unit is in [MODE 1, 2, or 3 - BWRs] [MODE 1, 2, 3, or 4 - PWRs], an individual with a valid Senior Reactor Operator license shall be designated to assume the control room command function. During any absence of the Shift Supervisor from the control room while the unit is in [MODE 4 or 5 - BWRs] [MODE 5 or 6 - PWRs], an individual with a valid Senior Reactor Operator license or Reactor Operator license shall be designated to assume the control room command function.

5.0 ADMINISTRATIVE CONTROLS

5.2 Organization

5.2.1 Onsite and Offsite Organizations

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

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

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

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

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

5.2.2 Unit Staff

The unit staff organization shall be as follows:

a. Each on-duty shift shall be composed of at least the minimum shift crew composition shown in Table 5.2.2-1;

(continued)

(continued)

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

c. A [Health Physics Technician] shall be on site when fuel is in the reactor. The position may be vacant for a period of time not to exceed 2 hours in order to provide for unexpected absence provided immediate action is taken to fill the required position;

d. Either a licensed Senior Reactor Operator (SRO) or licensed SRO limited to fuel handling who has no other concurrent responsibilities during this operation shall be present at the location of fuel handling and directly supervise all CORE ALTERATIONS; and

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

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

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

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

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

(continued)

(continued)

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

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

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

f. The [off-shift position below] shall hold a Senior Reactor Operator license; and

[Operations Manager
Assistant Operations Manager]

g. The Shift Technical Advisor (STA) shall provide advisory technical support to the Shift Supervisor (SS) in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit.

(continued)

Table 5.2.2-1 (Page 1 of 1)
Minimum Shift Crew Composition[1]
[Single Unit Facility]

POSITION[2]	UNIT IN MODE	
	[1, 2, or 3 [1, 2, 3, or 4	4 or 5 - BWRs] 5 or 6 - PWRs]
SS	1	1
SRO	1	None
RO	2	1
AO	2	1
STA[3]	1	None

[1] The shift crew composition may be one less than the minimum requirements of Table 5.2.2-1 for a period of time not to exceed 2 hours in order to accommodate unexpected absences of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 5.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

[2] Table Notation:

SS - Shift Supervisor with a Senior Reactor Operator license;
SRO - Individual with a Senior Reactor Operator license;
RO - Individual with a Reactor Operator license;
AO - Auxiliary Operator;
STA - Shift Technical Advisor.

[3] The STA position may be filled by an on-shift SS or SRO provided the individual meets the Commission Policy Statement on Engineering Expertise on Shift.

(continued)

Table 5.2.2-1 (Page 1 of 2)
Minimum Shift Crew Composition[1]
[Two Units With a Common Control Room]
(Totals for Both Units)

POSITION[2]	[EACH UNIT IN MODE 1, 2, OR 3 - BWRs] [EACH UNIT IN MODE 1, 2, 3, OR 4 - PWRs]
SS SRO RO AC STA[3]	1 1 3 3 1
POSITION[2]	[ONE UNIT IN MODE 1, 2, OR 3, AND ONE UNIT IN MODE 4, MODE 5, OR DEFUELED - BWRs] [ONE UNIT IN MODE 1, 2, 3, OR 4, AND ONE UNIT IN MODE 5, MODE 6, OR DEFUELED - PWRs]
SS SRO RO AO STA[3]	1 None 2 3 None
POSITION[2]	[EACH UNIT IN MODE 4, MODE 5, OR DEFUELED - BWRs] [EACH UNIT IN MODE 5, MODE 6, OR DEFUELED - PWRs]
SS SRO RO AO STA[3]	1 None 2 3 None

(continued)

Table 5.2.2-1 (Page 2 of 2)
Minimum Shift Crew Composition[1]
[Two Units With a Common Control Room]
(Totals for Both Units)

[1] The shift crew composition may be one less than the minimum requirements of Table 5.2.2-1 for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members, provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 5.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

[2] Table Notation:

SS - Shift Supervisor with a Senior Reactor Operator license for each unit whose reactor contains fuel;
SRO - Individual with a Senior Reactor Operator license for each unit whose reactor contains fuel. Otherwise provide an individual for each unit who holds a Senior Reactor Operator license for the unit assigned. During CORE ALTERATIONS on either unit at least one licensed SRO or licensed SRO limited to fuel handling, who has no other concurrent responsibilities, must be present;
RO - Individual with a Reactor Operator license or a Senior Reactor Operator license for unit assigned. At least one RO shall be assigned to each unit whose reactor contains fuel and one RO shall be assigned as relief operator for unit(s) in [MODE 1, 2, or 3 - BWRs] [MODE 1, 2, 3, or 4 - PWRs]. Individuals acting as relief operators shall hold a license for both units. Otherwise, for each unit, provide a relief operator who holds a license for the unit assigned;
AO - At least one auxiliary operator shall be assigned to each unit whose reactor contains fuel;
STA - Shift Technical Advisor.

[3] The STA position may be filled by an on-shift SS or SRO provided the individual meets the Commission Policy Statement on Engineering Expertise on Shift.

(continued)

Table 5.2.2-1 (Page 1 of 2)
Minimum Shift Crew Composition[1]
[Two Units With Two Control Rooms]

[WITH THE OTHER UNIT IN MODE 1, 2, OR 3 - BWRs]
[WITH THE OTHER UNIT IN MODE 1, 2, 3, OR 4 - PWRs]

POSITION[2]	UNIT IN MODE	
	[1, 2, or 3 [1, 2, 3, or 4	4 or 5 - BWRs] 5 or 6 - PWRs]
SS	1[4]	1[4]
SRO	1	None
RO	2	1
AO	2	1
STA[3]	1[4]	None

[WITH THE OTHER UNIT IN MODE 4 OR 5 DEFUELED - BWRs]
[WITH THE OTHER UNIT IN MODE 5 OR 6 DEFUELED - PWRs]

POSITION[2]	UNIT IN MODE	
	[1, 2, or 3 [1, 2, 3, or 4	4 or 5 - BWRs] 5 or 6 - PWRs]
SS	1[4]	1[4]
SRO	1	None
RO	2	1
AO	2	2[5]
STA[3]	1	None

(continued)

Table 5.2.2-1 (Page 2 of 2)
Minimum Shift Crew Composition[1]
[Two Units With Two Control Rooms]

[1] The shift crew composition may be one less than the minimum requirements of Table 5.2.2-1 for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 5.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

[2] Table Notation:

SS - Shift Supervisor with a Senior Reactor Operator license;
SRO - Individual with a Senior Reactor Operator license;
RO - Individual with a Reactor Operator license;
AO - Auxiliary Operator;
STA - Shift Technical Advisor.

[3] The STA position may be filled by an on-shift SS or SRO provided the individual meets the Commission Policy Statement on Engineering Expertise on Shift.

[4] Individual may fill the same position on the other unit if licensed for both.

[5] One of the two required individuals may fill the same position on the other unit.

5.0 ADMINISTRATIVE CONTROLS

5.3 Unit Staff Qualifications

[Minimum qualifications for members of the unit staff shall be specified by use of an overall qualification statement referencing an American National Standard Institute (ANSI) standard acceptable to the NRC staff or, alternately, by specifying individual position qualifications. Generally, the first method is preferable; however, the second method is adaptable to those unit staffs requiring special qualification statements because of an unique organizational structure.]

Each member of the unit staff shall meet or exceed the minimum qualifications of Regulatory Guide 1.8, Revision 2, 1987 [or more recent revision or ANSI Standard acceptable to the NRC staff]. The staff not covered by this Regulatory Guide shall meet or exceed the minimum qualifications of [Regulations, Regulatory Guides, or ANSI standards acceptable to the NRC staff]. In addition, the Shift Technical Advisor shall meet the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift.

5.0 ADMINISTRATIVE CONTROLS

5.4 Training

A retraining and replacement training program for the unit staff shall be maintained under the direction of the [position title] and shall meet or exceed the requirements and recommendations of Section [ ] of [an ANSI standard acceptable to the NRC staff] and 10 CFR 55, and, for appropriate designated positions, shall include familiarization with relevant industry operational experience.

5.0 ADMINISTRATIVE CONTROLS

5.5 Reviews and Audits

[The licensee shall describe the method(s) established to conduct independent reviews and audits. The methods may take a range of forms acceptable to the NRC. These may include creating an organizational unit, a standing or ad hoc committee, or assigning individuals capable of conducting these reviews and audits. When an individual performs a review function, a cross-disciplinary review determination is necessary. If deemed necessary, such reviews shall be performed by the review personnel of the appropriate discipline. Individual reviewers shall not review their own work or work for which they have direct responsibility. Regardless of the method used, the licensee shall specify the functions, organizational arrangement, responsibilities, appropriate ANSI/ANS 3.1-1981 qualifications, and reporting requirements of each functional element or unit that contributes to these processes.

Reviews and audits of activities affecting plant safety have two distinct elements. The first of these is the review performed by plant staff personnel to ensure that day-to-day activities are conducted in a safe manner. These are described in Section 5.5.1. The second of these, described in Section 5.5.2, is the [offsite] review and audit of facility activities and programs affecting nuclear safety that are performed independent of the plant staff. The [offsite] review and audit should provide for the integration of the reviews and audits into a cohesive program to provide senior level utility management with an assessment of facility operation and recommend actions to improve nuclear safety and plant reliability. It should include an assessment of the effectiveness of reviews conducted according to Section 5.5.1.]

5.5.1 Plant Reviews

[The licensee shall describe here the provisions for plant reviews (organization, reporting, records) and appropriate ANSI/ANS standard for personnel qualification.]

a. Functions:

The [plant review method specified in 5.5.1] shall, as a minimum, incorporate the following functions:

1. Advise the [Plant Superintendent] on all matters related to nuclear safety,

(continued)

(continued)

2. Recommend to the [Plant Superintendent] approval or disapproval of items considered under Specification 5.5.1.b.1 through 5.5.1.b.6 prior to their implementation, except as provided in Specification 5.7.3,

3. Obtain approval from the [Plant Superintendent] of each proposed test or experiment and proposed changes and modifications to unit systems or equipment that affect nuclear safety prior to implementation,

4. Determine whether each item considered under Specifications 5.5.1.b.1 through 5.5.1.b.5 constitutes an unreviewed safety question,

5. Notify the [Vice President-Nuclear Operations] of any safety-significant disagreement between the [review organization or individual specified in 5.5.1] and the [Plant Superintendent] within 24 hours. However, the [Plant Superintendent] shall have responsibility for resolution of such disagreements pursuant to Specification 5.1.1;

b. Responsibilities:

The [plant review method specified in 5.5.1] shall be used to conduct, as a minimum, the following reviews:

1. Review of all proposed procedures required by Specification 5.7.1 and changes thereto,

2. Review of all proposed programs required by Specification 5.7.4 and changes thereto,

3. Review of all proposed changes and modifications to unit systems or equipment that affect nuclear safety,

4. Review of the Fire Protection Program and changes thereto,

5. Review of all proposed tests and experiments that affect nuclear safety; and

(continued)

(continued)

6. Review of all proposed changes to these Technical Specifications (TS), their Bases, and the operating license.

5.5.2 [Offsite] Review and Audit

[The licensee shall describe here the provisions for reviews and audits independent of the plant's staff (organization, reporting, records) and appropriate ANSI/ANS standards for personnel qualifications. These individuals may be located onsite or offsite provided organizational independence from plant staff is maintained. The technical review responsibility, 5.5.2.d, shall include several individuals located onsite.]

a. Functions:

The [offsite review and audit provisions specified in 5.5.2] shall as a minimum incorporate the following functions:

1. Advise the [Vice President - Nuclear Operations] on all matters related to nuclear safety and make recommendations for improving nuclear safety and plant reliability,

2. Advise the management of the audited organization, and the [Vice President - Nuclear Operations], of the audit results as they relate to nuclear safety,

3. Recommend to the management of the audited organization, and its management, any corrective action to improve nuclear safety and plant operation,

4. Notify the [Vice President - Nuclear Operations] of any safety-significant disagreement between the [review organization or individual specified in 5.5.2] and the [organization or function being reviewed] within 24 hours;

b. [Offsite] Review Responsibilities:

The [review method specified in 5.5.2] shall be responsible for the review of:

(continued)

(continued)

1. The safety evaluations for changes to procedures, equipment, or systems, and tests or experiments completed under the provision of 10 CFR 50.59, to verify that such actions did not constitute an unreviewed safety question,

2. Proposed changes to procedures, equipment, or systems which involve an unreviewed safety question as defined in 10 CFR 50.59,

3. Proposed tests or experiments which involve an unreviewed safety question as defined in 10 CFR 50.59,

4. Proposed changes to TSs and the operating license,

5. Violations of codes, regulations, orders, license requirements, and of internal procedures or instructions having nuclear safety significance,

6. All Licensee Event Reports required by 10 CFR 50.73,

7. Plant staff performance,

8. Indications of unanticipated deficiencies in any aspect of design or operation of structures, systems, or components that could affect nuclear safety,

9. Significant accidental, unplanned, or uncontrolled radioactive releases including corrective action to prevent recurrence,

10. Significant operating abnormalities or deviations from normal and expected performance of equipment that affect nuclear safety,

11. The performance of the corrective action system,

Reports or records of these reviews shall be forwarded to the [Vice President - Nuclear Operations] within 30 days following completion of the review;

(continued)

(continued)

c. Audit Responsibilities

The audit responsibilities shall encompass:

1. The conformance of unit operation to provisions contained within the TSs and applicable license conditions,

2. The training and qualifications of the unit staff,

3. The implementation of all programs required by Specification 5.7.2,

4. Actions taken to correct deficiencies occurring in equipment, structures, systems, components, or method of operation that affect nuclear safety,

5. The performance of activities required to meet the requirements of Appendix B to 10 CFR 50,

6. Other activities and documents as requested by the [Vice President-Nuclear Operations];

Reports or records of these audits shall be forwarded to the [Vice President-Nuclear Operations] within 30 days following completion of the review;

d. [Technical] Review Responsibilities:

The [technical] review responsibilities shall encompass:

1. Plant operating characteristics, NRC issuances, industry advisories, Licensee Event Reports, and other sources which may indicate areas for improving plant safety,

2. Plant operations, modifications, maintenance, and surveillance to independently verify that these activities are performed safely and correctly and that human errors are reduced as much as practical,

3. Internal and external operational experience information that may indicate areas for improving plant safety, and

(continued)

(continued)

4. Making detailed recommendations through the [Vice President-Nuclear Operations] for revising procedures, equipment modifications or other means of improving nuclear safety and plant reliability.

5.5.3 Records

Written records of reviews and audits shall be maintained. Reports or records of activities shall be forwarded to the [Vice President-Nuclear Operations] within 30 days following completion of the review or audit. As a minimum these records shall include:

a. Results of the activities conducted under the provisions of Specification 5.5;

b. Recommendations to the management of the organization being audited;

c. An assessment of the safety significance of the review or audit findings;

d. Recommended approval or disapproval of items considered under Specifications 5.5.1.b.1 through 5.5.1.b.6; and

e. Determination of whether each item considered under Specifications 5.5.1.b.1 through 5.5.1.b.5 constitutes an unreviewed safety question.

5.0 ADMINISTRATIVE CONTROLS

5.6 Technical Specifications (TS) Bases Control

Changes to the Bases of the TS shall be made under appropriate administrative controls and reviewed according to Specification 5.5.1.

Licensees may make changes to Bases without prior NRC approval provided the changes do not involve any of the following:

a. A change in the TS incorporated in the license;

b. A change to the updated FSAR that involves an unreviewed safety question as defined in 10 CFR 50.59;

One criterion for determining whether an unreviewed safety question is involved is if the change would reduce the "margin of safety as defined in the basis for any technical specification" (10 CFR 50.59(2)(iii)). The applicable safety analyses discussion for each TS Bases section should address the acceptance limits to which the margin of safety relates as defined by [the NRC document endorsing industry guidance for performing 10 CFR 50.59 safety evaluations]. If a specification does not relate to any margin of safety, then the corresponding Bases (Sections 2.0 and 3.1 through 3.9 {VS-GE: 3.10}) should so state;

c. A change to the way that OPERABILITY or the TS could be met, applied, or interpreted;

d. A change in the organization of the Bases for TS Sections 2.0 and 3.1 through 3.9 {VS-GE: 3.10}. Each of these Bases sections shall be organized into the following subsections:

1. Background,
2. Applicable Safety Analysis,
3. LCOs (or Safety Limits for Section 2.0),
4. Applicability (not applicable to Section 2.0),
5. ACTIONS (or Safety Limit Violations for Section 2.0),

(continued)

(continued)

6. Surveillance Requirements (not applicable to Section 2.0), and

7. References.

Proposed changes which meet the criteria of (a), (b), (c), or (d) above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases which may be implemented without prior NRC approval will be provided to the NRC at least annually.

5.0 ADMINISTRATIVE CONTROLS

5.7 Procedures, Programs, and Manuals

5.7.1 Procedures

Written procedures shall be established, implemented, and maintained covering the activities referenced below:

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

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

c. Security plan implementation;

d. Emergency plan implementation;

e. Quality assurance for effluent and environmental monitoring;

f. Fire Protection Program implementation; and

g. All programs specified in Specification 5.7.4 [; and]

VS-CE [h. Modification of core protection calculator (CPC) addressable constants. These procedures should include provisions to assure that sufficient margin is maintained in CPC type I addressable constants to avoid excessive operator interaction with the CPCs during reactor operation.

Modifications to the CPC software (including changes of algorithms and fuel cycle specific data) shall be performed in accordance with the most recent version of "CPC Protection Algorithm Software Change Procedure," CEN-39(A)-P that has been determined to be applicable to the facility. Additions or deletions to CPC addressable constants or changes to addressable constant software limit values shall not be implemented without prior NRC approval.]

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5.7.2 Review and Approval

Each procedure of Specification 5.7.1, and changes thereto, shall be reviewed in accordance with Specification 5.5.1, approved by the [Plant Superintendent] prior to implementation and reviewed periodically as set forth in administrative procedures.

5.7.3 Temporary Changes

Temporary changes to procedures of Specification 5.7.1 may be made provided:

a. The intent of the existing procedure is not altered;

b. The change is approved by two members of the plant manageme staff, at least one of whom holds a Senior Reactor Operator license on the unit affected; and

c. The change is documented and reviewed in accordance with Specifications 5.5.1 and approved by the [Plant Superintendent] within 14 days of implementation.

5.7.4 Programs and Manuals

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

a. Radiation Protection Program:

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure;

b. Process Control Program (PCP):

The PCP shall contain the current formulas, sampling, analyses, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes will be accomplished in such a way as to assure compliance with 10 CFR 20, 61, and 71, state regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste;

(continued)

(continued)

Licensee-initiated changes to the PCP:

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

   a) Sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   b) A determination that the change(s) will maintain the overall conformance of the solidified waste product to existing requirements of Federal, State, or other applicable regulations,

2. Shall be effective after review and acceptance by the [review method of Specification 5.5.1] and the approval of the [Plant Superintendent];

c. Offsite Dose Calculation Manual (ODCM):

The ODCM shall contain the methodology and parameters used:

1. In the calculation of offsite doses resulting from radioactive gaseous and liquid effluents,

2. In the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints,

3. In the conduct of the environmental Radiological Monitoring Program;

The ODCM shall also contain:

1. The Radioactive Effluent Controls and Radiological Environmental Monitoring programs required by Specification 5.7.4,

2. Descriptions of the information that should be included in the Annual Radiological Environmental Operating, and Semiannual Radioactive Effluent Release Reports required by Specifications [5.9.1.3] and [5.9.1.4];

(continued)

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Licensee-initiated changes to the ODCM:

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

   a) Sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s),

   b) A determination that the change(s) will maintain the level of radioactive effluent control required by 10 CFR 20.106, 40 CFR 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50 and not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations,

2. Shall become effective after review and acceptance by the [review method of Specification 5.5.1] and the approval of the [Plant Superintendent],

3. Shall be submitted to the Commission in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Semiannual Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (e.g., month and year) the change was implemented;

d. Primary Coolant Sources Outside Containment:

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include [the recirculation spray, safety injection, chemical and volume control, gas stripper, and hydrogen recombiners]. The program shall include the following:

1. Preventive maintenance and periodic visual inspection requirements,

2. Integrated leak test requirements for each system at refueling cycle intervals or less;

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e. In-Plant Radiation Monitoring:

This program provides controls to ensure the capability to accurately determine the airborne iodine concentration in vital areas under accident conditions. This program shall include the following:

1. Training of personnel,

2. Procedures for monitoring,

3. Provisions for maintenance of sampling and analysis equipment;

f. Post-Accident Sampling:

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

1. Training of personnel,

2. Procedures for sampling and analysis,

3. Provisions for maintenance of sampling and analysis equipment;

g. Radioactive Effluent Controls Program:

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

1. Limitations on the OPERABILITY of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM,

(continued)

(continued)

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

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

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

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

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

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

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

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

(continued)

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

VS-GE

11. Limitations on venting and purging of the Mark II containment through the Standby Gas Treatment System to maintain releases as low as reasonably achievable (BWRs w/Mark II containments);]

h. Radiological Environmental Monitoring Program:

This program is for monitoring the radiation and radionuclides in the environs of the plant. The program shall provide representative measurements of radioactivity in the highest potential exposure pathways and verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall be contained in the ODCM, conform to the guidance of Appendix I to 10 CFR 50, and include the following:

1. Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,

2. A Land Use Census to ensure that changes in the use of areas at and beyond the site boundary are identified and that modifications to the monitoring program are made if required by the results of this census,

3. Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring;

i. Component Cyclic or Transient Limit:

This program provides controls to track the FSAR Section [ ] cyclic and transient occurrences to ensure that components are maintained within the design limits;

(continued)

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j. Containment Leakage Rate Test Program:

This program provides controls to ensure that the containment leakage rate tests are performed to ensure containment leak tightness, which is a requirement for OPERABILITY. The program shall include the following surveillances required by 10 CFR 50, Appendix J:

1. Type A tests (overall integrated containment leakage rate),

2. Type B tests (local penetration leak rates),

3. Type C tests (containment isolation valve leakage rates),

4. Air lock seal leakage and air lock overall leakage rates,

5. Isolation valve and channel weld pressurization system pressure verifications,

6. [ ]-inch purge supply and exhaust leakage rates;

[k. Pre-stressed Concrete Containment Tendon Surveillance Program:

This program provides controls for monitoring any tendon degradation in pre-stressed concrete containments to ensure containment structural integrity, a requirement for OPERABILITY. The program shall include baseline measurements prior to initial operations. The Tendon Surveillance Program shall include at least the following:

1. Tendon lift-off to check tendon force,

2. The number of tendons inspected for each tendon group,

3. Tendon wire samples taken to check physical condition, tensile strength and elongation,

4. Grease samples taken to check chemical properties, physical appearance, and presence of free water,

5. Measurement of grease voids,

6. Visual inspection of end anchorage and containment exterior surface for cracking and grease leakage,

(continued)

(continued)

7. Procedures for establishing inspection frequencies,

8. Acceptance criteria,

9. The content and frequency of reporting,

10. Remedial actions including the OPERABILITY criteria and reporting requirements when one or more of the acceptance criteria are not met;

The Tendon Surveillance Program and all proposed changes thereto shall be reviewed and approved by the NRC staff prior to implementation.]

l. Inservice Inspection Program:

This program provides controls for inservice inspection and assessment of flaws of American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components. The program shall include the following:

1. Provisions that inservice inspection, repairs, replacements, modifications, and assessment of flaws to ascertain if acceptable assurance exists that the structural integrity of ASME Code Class 1, 2, and 3 components will be maintained, shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and Addenda, as required by 10 CFR 50.55a(g), except where relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i) and (a)(3),

VS-CE, W, B&W

[2. Inspection of each reactor coolant pump flywheel per the recommendations of Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1, August 1975;]

3. The provisions of SR 3.0.2 as applicable to the frequencies for performing inservice inspection activities,

(continued)

(continued)

VS-GE

[4. An inservice inspection program for piping identified in NRC Generic Letter 88-01 in accordance with the NRC staff positions on schedule, methods, personnel, and sample expansion included in this generic letter or in accordance with alternate measures approved by the NRC staff,]

5. Provisions that nothing in the ASME Boiler and Pressure Vessel code shall be construed to supersede the requirements of any Technical Specifications (TS).

m. Inservice Testing Program:

This program provides controls for inservice testing of ASME code Class 1, 2, and 3 components. The program shall include the following:

1. Provisions that inservice testing of ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i) and (a)(3),

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

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

(continued)

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3. The provisions of SR 3.0.2 as applicable to the above required frequencies for performing inservice testing activities,

4. The provisions of SR 3.0.3 as applicable to inservice testing activities,

5. Provisions that nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

[n. Steam Generator (SG) Tube Surveillance:

VS-B&W, W, CE

This program provides controls for monitoring steam generator tube degradation. Each SG shall be demonstrated OPERABLE by meeting the requirements of Specification 5.7.4.1 and by performance of an approved augmented inservice inspection program which includes at least the following:

1. SG sample selection and inspection,

2. SG tube sample selection and inspection,

3. The establishment of inspection frequencies,

4. Acceptance criteria,

5. The content and frequency of reports;

The Steam Generator Tube Surveillance Program and all proposed changes thereto shall be reviewed and approved by the NRC staff prior to implementation.]

[o. Secondary Water Chemistry:

VS-W, CE

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation and low pressure turbine disc stress corrosion cracking. The program shall include:

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

2. Identification of the procedures used to measure the values of the critical variables,

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

4. Procedures for the recording and management of data,

5. Procedures defining corrective actions for all off-control point chemistry conditions,

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

p. Ventilation Filter Testing Program:

A program shall be established to implement the following required testing of filters in accordance with [Regulatory Guide 1.52, Revision 2 or ANSI N510-1980]:

1. In-place penetration and bypass dioctyl phthalate (DOP) test,

2. In-place penetration and bypass hydrocarbon refrigerant gas test,

3. Methyl iodide penetration test of a charcoal sample,

4. Flow rate and pressure drop test, and

5. Heater power test;

q. Explosive Gas and Storage Tank Radioactivity Monitoring Program:

This program provides assurance of the following:

1. That the concentration of potentially explosive gas mixtures contained in the [waste gas holdup system] is maintained below the flammability limits of hydrogen and oxygen,

2. That in the event of an uncontrolled release of gaseous waste storage tank contents, the resulting offsite

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radiological consequences will not exceed a small fraction of the dose reference values in 10 CFR 100, and

3. That in the event of an uncontrolled release of outdoor liquid storage tank contents, the resulting concentrations would be less than the limits specified in 10 CFR 20 at the nearest potable or surface water supply in an unrestricted area.

The program shall include:

1. The limits for the concentration of hydrogen and oxygen in the [Waste Gas Holdup System] and a surveillance program to ensure the limits are maintained. Such limits shall be appropriate to the system's design criteria (i.e., whether or not the system is designed to withstand a hydrogen explosion),

2. The limits for the quantity of radioactive gas contained in each gas storage tank and a surveillance program to ensure the limits are maintained, and

3. The limits for the quantity of radioactive material contained in unprotected outdoor tanks and a surveillance program to ensure the limits are maintained.

The limits specified in this program and any proposed changes thereto shall be reviewed and approved by the NRC staff prior to implementation.

5.0 ADMINISTRATIVE CONTROLS

5.8 OPERABILITY Definition Implementation Principles and Rules

This section presents the rules for implementing the general principles embodied by the definition of OPERABLE-OPERABILITY that were used in the development of the Technical Specifications (TS). Adherence to these principles and implementing rules are required to ensure acceptable TS.

The definition of OPERABLE-OPERABILITY included in the TS is as follows:

"A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s)."

The specified function(s) of the system, subsystem, train, component, or device (hereafter referred to as system) is that specified safety function(s) in the licensing basis for the facility.

5.8.1 General Principles of OPERABILITY

GENERAL PRINCIPLE 1: A system is considered OPERABLE as long as there exists assurance that it is capable of performing its specified safety function(s).

GENERAL PRINCIPLE 2: A system can perform its specified safety function(s) only when all of its necessary support systems are capable of performing their related support functions.

GENERAL PRINCIPLE 3: Assuring the capability to perform a safety function is an ongoing and continuous process.

GENERAL PRINCIPLE 4: When all systems designed to perform a certain safety function are not capable of performing that safety function, a loss of function condition exists. Facility operation with such a condition may not continue.

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GENERAL PRINCIPLE 5: When a system is determined to be incapable of performing its intended safety function(s), the declaration of inoperability shall be immediate.

GENERAL PRINCIPLE 6: Any exception to an immediate determination of inoperability must be justified.

5.8.2 Implementation Rules for TS

The definition of OPERABLE-OPERABILITY embodies a principle that a system can perform its function(s) only if all necessary support systems are capable of performing their related support functions. This definition extends the requirements of a Limiting Condition for Operation (LCO) for those systems that directly perform a specified function (supported system) to those that perform a required support function (support systems).

The timeliness of OPERABILITY determinations in response to nonconforming or degraded conditions should be commensurate with the safety significance of the issue. Once a determination of inoperability is made regarding a support or supported system included in the TS or a support system not included in the TS but necessary to support one or more systems included in the TS, then the actions to be taken are governed by the following rules:

IMPLEMENTATION RULE 1: Upon determining that a support or supported system is inoperable, the system is immediately declared inoperable.

IMPLEMENTATION RULE 2: When a support or supported system that is included in the TS is declared inoperable, the corresponding LCO is immediately entered.

IMPLEMENTATION RULE 3: When a support system is declared inoperable, all of its supported systems are immediately declared inoperable and the associated LCOs are entered unless otherwise justified:

a. In the Bases of the support system LCO, or

b. In the Bases of the supported system LCO or FSAR, or both, if the support system is not included in TS.

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IMPLEMENTATION RULE 4: When a support or supported system is declared inoperable in one train, the corresponding independent support or supported systems and all other associated support systems in the opposite train(s) are verified to be OPERABLE to ensure that the complete capability to perform the specified safety function has not been lost (i.e., loss of functional capability).

IMPLEMENTATION RULE 5: Upon determining that a loss of functional capability condition exists, actions specified in the support or supported system LCOs are taken to mitigate the loss of the functional capability.

(Guidance in support of these rules that was used in the development of the new Standard TS is presented in Section 1.5.)

5.8.3 Support and Supported Systems Association

[The licensee shall describe here the approach it established to associate TS and non-TS support systems with TS supported systems.]

5.0 ADMINISTRATIVE CONTROLS

5.9 Reporting Requirements

5.9.1 Routine Reports

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

5.9.1.1 Startup Report

A summary report of plant startup and power escalation testing shall be submitted following:

a. Receipt of an Operating License,

b. Amendment to the license involving a planned increase in power level,

c. Installation of fuel that has a different design or has been manufactured by a different fuel supplier; and

d. Modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the unit.

The initial Startup Report shall address each of the startup tests identified in Chapter 14 of the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report. Subsequent Startup Reports shall address startup tests that are necessary to demonstrate the acceptability of changes and modifications.

Startup Reports shall be submitted within 90 days following completion of the Startup Test program; 90 days following resumption or commencement of commercial power operation; or 9 months following

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initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of Startup Test Program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

5.9.1.2 Annual Reports

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

Annual Reports covering the activities of [illegible]s described below for the previous calendar [illegible] be submitted by March 31 of each year. The [illegible]ort shall be submitted by March 31 of the year [illegible]ng initial criticality.

Reports required on an annual basis include:

a. Occupational Radiation Exposure Report

A tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions (e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance [describe maintenance], waste processing, and refueling). This tabulation supplements the requirements of Section 20.407 of 10 CFR 20. The dose assignments to various duty functions may be estimated based on pocket dosimeter, thermoluminescent dosimeter (TLD), or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions; and

[b. Any other unit unique reports required on an annual basis.]

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5.9.1.3 Annual Radiological Environmental Operating Report

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

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

The Annual Radiological Environmental Operating Report shall include the results of analyses of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. The report shall identify the thermoluminescent dosimeter (TLD) results that represent co-located dosimeters in relation to the NRC TLD program and the exposure period associated with each result. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

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5.9.1.4 Semiannual Radioactive Effluent Release Report

-------------------------NOTE--------------------
A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station, however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

The Semiannual Radioactive Effluent Release Report covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program (PCP) and in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR 50.

5.9.1.5 Monthly Operating Reports

Routine reports of operating statistics and shutdown experience[, including documentation of all challenges to the power-operated relief values (PORVs) or safety valves] shall be submitted on a monthly basis no later than the 15th of each month following the calendar month covered by the report.

5.9.1.6 CORE OPERATING LIMITS REPORT (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, for the following:

   1. [The individual specifications that address core operating limits must be referenced here.]

   and shall be documented in the COLR.

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b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

1. [Identify the Topical Report(s) by number, title, date, and NRC staff approval document, or identify the staff Safety Evaluation Report for a plant-specific methodology by NRC letter and date.]

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal hydraulic limits, Emergency Core Cooling System (ECCS) limits, nuclear limits such as shutdown margin, transient analysis limits, and accident analysis limits) of the safety analysis are met; and

d. The COLR, including any mid-cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.9.2 Special Reports

[Special Reports may be required covering inspection, test, and maintenance activities. These special reports are determined on an individual basis for each unit and their preparation and submittal are designated in the Technical Specifications.]

Special Reports shall be submitted to the Regional Administrator of the Regional Office of the NRC within the time period specified for each report.

[The following Special Reports shall be submitted:]

a. In the event an ECCS is actuated and injects water into the RCS, a Special Report shall be prepared and submitted within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70;

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b. If an individual emergency diesel generator (EDG) experiences 4 or more valid failures in the last 25 demands, these failures and any non-valid failures experienced by that EDG in that time period shall be reported within 30 days. Reports on EDG failures shall include the information recommended in Regulatory Position C.5 of Regulatory Guide 1.9, Revision 3;

c. When a pre-planned alternate method of monitoring post-accident instrumentation functions is required by Condition E of LCO 3.3.[X], a report shall be submitted within 14 days from the time the action is required. The report shall outline the action taken, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the function to OPERABLE status; and

d. The NRC shall be informed within 24 hours of discovery of a reactivity anomaly involving a disparity of $\geq$ 1% $\Delta k/k$ in core reactivity in which the cause cannot be determined.

[VS-B&W,CE,W] In addition, the NRC shall be informed within 24 hours of discovery of a [quadrant power tilt ratio (QPTR) $\geq$ 1.09 or quadrant power tilt > maximum limit or Azimuthal Power Tilt (T_q) $\geq$ 0.10].

5.0 ADMINISTRATIVE CONTROLS

5.10 Record Retention

In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

5.10.1 The following records shall be retained for at least 3 years:

a. All License Event Reports required by 10 CFR 50.73;

b. Records of changes made to the procedures required by Specification 5.7.1; and

c. Records of radioactive shipments.

5.10.2 The following records shall be retained for at least 5 years:

a. Records and logs of unit operation covering time interval at each power level;

b. Records and logs of principal maintenance activities, inspections, repair, and replacement of principal items of equipment related to nuclear safety;

c. Records of surveillance activities, inspections, and calibrations required by the Technical Specifications (TS) [and the Fire Protection Program];

d. Records of sealed source and fission detector leak tests and results; and

e. Records of annual physical inventory of all sealed source material of record.

5.10.3 The following records shall be retained for the duration of the unit Operating License:

a. Records and drawing changes reflecting unit design modifications made to systems and equipment described in the FSAR;

b. Records of new and irradiated fuel inventory, fuel transfers, and assembly burnup histories;

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c. Records of radiation exposure for all individuals entering radiation control areas;

d. Records of gaseous and liquid radioactive material released to the environs;

e. Records of transient or operational cycles for those unit components identified in [FSAR, Section X];

f. Records of reactor tests and experiments;

g. Records of training and qualification for current members of the unit staff;

h. Records of inservice inspections performed pursuant to the TS;

i. Records of quality assurance activities required by the Operational Quality Assurance (QA) Manual [not listed in Specification 5.10.1 and which are classified as permanent records by applicable regulations, codes and standards];

j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59;

k. Records of the reviews and audits required by Specifications 5.5.1 and 5.5.2;

l. Records of the service lives of all hydraulic and mechanical snubbers required by [document where snubber requirements relocated to] including the date at which the service life commences and associated installation and maintenance records;

[m. Records of secondary water sampling and water quality;]

n. Records of analyses required by the Radiological Environmental Monitoring Program that would permit evaluation of the accuracy of the analysis at a later date. This should include procedures effective at specified times and QA records showing that these procedures were followed;

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o. Records of reviews performed for changes made to the Offsite Dose Calculation Manual and the Process Control Program;

[p. Records of pre-stressed concrete containment tendon surveillances;] and

[q. Records of steam generator tube surveillances.]

5.0 ADMINISTRATIVE CONTROLS

5.11 High Radiation Area

5.11.1 Pursuant to paragraph 20.203(c)(5) of 10 CFR 20, in lieu of the requirements of 10 CFR 20.203(c), each high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is > 100 mrem/hr but < 1000 mrem/hr, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g., [Health Physics Technician]) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates ≤ 1000 mrem/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area, or

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them, or

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the [Radiation Protection Manager] in the RWP.

5.11.2 In addition to the requirements of Specification 5.11.1, areas with radiation levels ≥ 1000 mrem/hr shall be provided with locked doors to prevent unauthorized entry and the keys shall be maintained under the administrative control of the Shift Foreman on duty or health physics supervision. Doors shall remain locked except during periods of access by personnel under an approved

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RWP which shall specify the dose rate levels in the immediate work areas and the maximum allowable stay time for individuals in that area. In lieu of the stay time specification of the RWP, direct or remote (such as closed circuit TV cameras) continuous surveillance may be made by personnel qualified in radiation protection procedures to provide positive exposure control over the activities being performed within the area.

For individual high radiation areas accessible to personnel with radiation levels of > 1000 mrem/hr that are located within large areas, such as reactor primary containment, where no enclosure exists for purposes of locking, and where no enclosure can be reasonably constructed around the individual area, that individual area shall be barricaded, conspicuously posted, and a flashing light shall be activated as a warning device.

APPENDIX A

Acronyms

The following acronyms are used, but not defined, in the Standard Technical Specifications:

AC	alternating current
CFR	Code of Federal Regulations
DC	direct current
FSAR	Final Safety Analysis Report
LCO	Limiting Condition for Operation
SR	Surveillance Requirement
GDC	General Design Criteria or General Design Criterion

The following acronyms are used, with definitions, in the Standard Technical Specifications:

ACOT	ANALOG CHANNEL OPERATIONAL TEST
ADS	Automatic Depressurization System
ADV	atmospheric dump valve
AFD	AXIAL FLUX DIFFERENCE
AFW	auxiliary feedwater
AIRP	air intake, recirculation, and purification
ALARA	as low as reasonably achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
AOO	anticipated operational occurrence
AOT	allowed outage time
APD	axial power distribution
APLHGR	average planar linear heat generation rate
APRM	average power range monitor
APSR	axial power shaping rod
ARO	all rods out
ARC	auxiliary relay cabinets
ARS	Air Return System
ARTS	Anticipatory Reactor Trip System
ASGT	asymmetric steam generator transient
ASGTPTF	asymmetric steam generator transient protective trip function
ASI	axial shape index
ASME	American Society of Mechanical Engineers

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APPENDIX A (continued)

ASTM	American Society for Testing Materials
ATWS	anticipated transient without scram
ATWS-RPT	anticipated transient without scram recirculation pump trip
AVV	atmospheric vent valve
BAST	boric acid storage tank
BAT	boric acid tank
BDPS	Boron Dilution Protection System
BIST	boron injection surge tank
BIT	boron injection tank
BOC	beginning of cycle
BOP	balance of plant
BPWS	banked position withdrawal sequence
BWST	borated water storage tank
BTP	Branch Technical Position
CAD	containment atmosphere dilution
CAOC	constant axial offset control
CAS	Chemical Addition System
CCAS	containment cooling actuation signal
CCGC	containment combustible gas control
CCW	component cooling water
CEA	control element assembly
CEAC	control element assembly calculator
CEDM	control element drive mechanism
CFT	core flood tank
CIAS	containment isolation actuation signal
COLR	CORE OPERATING LIMITS REPORT
COLSS	Core Operating Limits Supervisory System
CPC	core protection calculator
CPR	critical power ratio
CRA	control rod assembly
CRD	control rod drive
CRDA	control rod drop accident
CRDM	control rod drive mechanism
CREHVAC	Control Room Emergency Air Temperature Control System
CREFS	Control Room Emergency Filtration System
CREVS	Control Room Emergency Ventilation System
CRFAS	Control Room Fresh Air System
CS	core spray
CSAS	containment spray actuation signal

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APPENDIX A (continued)

CST	condensate storage tank
CVCS	Chemical and Volume Control System
DBA	Design Basis Accident
DBE	Design Basis Event
DF	decontamination factor
DG	diesel generator
DIV	drywell isolation valve
DNB	departure from nucleate boiling
DNBR	departure from nucleate boiling ratio
DOP	diocytl phthalate
DPIV	drywell purge isolation valve
DRPI	digital rod position indicator
EAB	exclusion area boundary
ECCS	Emergency Core Cooling System
ECW	essential chilled water
ECP	estimated critical position
EDG	emergency diesel generator
EFAS	Emergency Feedwater Actuation System
EFIC	emergency feedwater initiation and control
EFCV	excess flow check valve
EFPDs	effective full power days
EFPYs	effective full power years
EFW	emergency feedwater
EHC	electro-hydraulic control
EOC	end of cycle
EOC-RPT	end of cycle recirculation pump trip
ESF	engineered safety feature
ESFAS	Engineered Safety Feature Actuation System
ESW	essential service water
EVS	Emergency Ventilation System
FBACS	Fuel Building Air Cleanup System
FCV	flow control valve
FHAVS	Fuel Handling Area Ventilation System
FSPVS	Fuel Storage Pool Ventilation System
FRC	fractional relief capacity
FR	Federal Register
FTC	fuel temperature coefficient
FWLB	feedwater line break

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HCS	Hydrogen Control System; Hydrazine Control System
HCU	hydraulic control unit
HIS	Hydrogen Ignition System
HELB	high energy line break
HEPA	high efficiency particulate air
HMS	Hydrogen Mixing System
HPCI	high pressure coolant injection
HPCS	high pressure core spray
HPI	high pressure injection
HPSI	high pressure safety injection
HPSP	high power setpoint
HVAC	heating, ventilation, and air conditioning
HZP	hot zero power
ICS	Iodine Cleanup System
IEEE	Institute of Electrical and Electronic Engineers
IGSCC	intergranular stress corrosion cracking
IRM	intermediate range monitor
ISLH	inservice leak and hydrostatic
ITC	isothermal temperature coefficient
K-relay	control relay
LCS	Leakage Control System
LEFM	linear elastic fracture mechanics
LER	Licensee Event Report
LHGR	linear heat generation rate
LHR	linear heat rate
LLS	low-low set
LOCA	loss-of-coolant accident
LOCV	loss of condenser vacuum
LOMFW	loss of main feedwater
LOP	loss of power
LOPS	loss of power start
LOVS	loss of voltage start
LPCI	low pressure coolant injection
LPCS	low pressure core spray
LPD	local power density
LPI	low pressure injection
LPRM	local power range monitor
LPSI	low pressure safety injection
LPSP	low power setpoint

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APPENDIX A (continued)

LPZ	low population zone
LSSS	limiting safety system settings
LTA	lead test assembly
LTOP	low temperature overpressure protection
MAPLHGR	maximum average planar linear heat generation rate
MAPFAC	MAPLHGR factor
$MAPFAC_f$	MAPLHGR factor, flow-dependent component
$MAPFAC_p$	MAPLHGR factor, power-dependent component
MCPR	minimum critical power ratio
MCR	main control room
MCREC	main control room environmental control
MFI	minimum flow interlock
MFIV	main feedwater isolation valve
MFLPD	maximum fraction of limiting power density
MFRV	main feedwater regulation valve
MFW	main feedwater
MG	motor generator
MOC	middle of cycle
MSIS	main steam isolation signal
MSIV	main steam isolation valve
MSLB	main steam line break
MSSV	main steam safety valve
MTC	moderator temperature coefficient
NDT	nil-ductility temperature
NDTT	nil-ductility transition temperature
NI	nuclear instrument
NIS	Nuclear Instrumentation System
NMS	Neutron Monitoring System
NPSH	net positive suction head
NSSS	Nuclear Steam Supply System
ODCM	Offsite Dose Calculation Manual
OPDRV	operation with a potential for draining the reactor vessel
OTSG	once-through steam generator
PAM	post-accident monitoring
PCCGC	primary containment combustible gas control
PCI	primary containment isolation

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PCIV	primary containment isolation valve
PCHRS	Primary Containment Hydrogen Recombiner System
PCP	Process Control Program
PCPV	primary containment purge valve
PCT	peak cladding temperature
PDIL	power dependent insertion limit
PDL	power distribution limit
PF	position factor
PIP	position indication probe
PIV	pressure isolation valve
PORV	power operated relief valve
PPS	Plant Protective System
PRA	probabilistic risk assessment
PREACS	Pump Room Exhaust Air Cleanup System; Penetration Room Exhaust Air Cleanup System
PSW	plant service water
P/T	pressure and temperature
PTE	PHYSICS TESTS exception
PTLR	PRESSURE AND TEMPERATURE LIMITS REPORT
QA	quality assurance
QPT	quadrant power tilt
QPTR	QUADRANT POWER TILT RATIO
QS	quench spray
RACS	Rod Action Control System
RAOC	relaxed axial offset control
RAS	recirculation actuation signal
RB	reactor building
RBM	rod block monitor
RCCA	rod cluster control assembly
RCIC	reactor core isolation cooling
RCIS	Rod Control and Information System
RCP	reactor coolant pump
RCPB	reactor coolant pressure boundary
RCS	Reactor Coolant System
REA	rod ejection accident
RHR	residual heat removal
RHRSW	residual heat removal service water
RMCS	Reactor Manual Control System
RPB	reactor pressure boundaries
RPC	rod pattern controller
RPCB	reactor power cutback

(continued)

RPIS	Rod Position Information System
RPS	Reactor Protection System
RPV	reactor pressure vessel
RS	recirculation spray
RT	reference temperature
RT_{NDT}	nil-ductility reference temperature
RTCB	reactor trip circuit breaker
RTD	resistance temperature detector
RTM	reactor trip module
RTP	RATED THERMAL POWER
RTS	Reactor Trip System
RWCU	reactor water cleanup
RWE	rod withdrawal error
RWL	rod withdrawal limiter
RWM	rod worth minimizer
RWP	Radiation Work Permit
RWST	refueling water storage tank
RWT	refueling water tank
SAFDL	specified acceptable fuel design limits
SBCS	Steam Bypass Control System
SBO	station blackout
SBVS	Shield Building Ventilation System
SCAT	spray chemical addition tank
SCI	secondary containment isolation
SCR	silicon controlled rectifier
SDV	scram discharge volume
SDM	SHUTDOWN MARGIN
SER	Safety Evaluation Report
SFRCS	Steam and Feedwater Rupture Control System
SG	steam generator
SGTR	steam generator tube rupture
SGTS	Standby Gas Treatment System
SI	safety injection
SIAS	safety injection actuation signal
SIS	safety injection signal
SIT	safety injection tank
SJAE	steam jet air ejector
SL	Safety Limit
SLB	steam line break
SLC	standby liquid control
SLCS	Standby Liquid Control System
SPMS	Suppression Pool Makeup System
SRM	source range monitor

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APPENDIX A (continued)

S/RV	safety/relief valve
S/RVDL	safety/relief valve discharge line
SSPS	Solid State Protection System
SSW	standby service water
SWS	Service Water System
STE	special test exception
STS	Standard Technical Specifications
TADOT	TRIP ACTUATING DEVICE OPERATIONAL TEST
TCV	turbine control valve
TIP	transversing incore probe
TLD	thermoluminescent dosimeter
TM/LP	thermal margin/low pressure
TS	Technical Specifications
TSV	turbine stop valve
UHS	Ultimate Heat Sink
VCT	volume control tank
VFTP	Ventilation Filter Testing Program
VHPT	variable high power trip
v/o	volume percent
VS	vendor specific
ZPMB	zero power mode bypass

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11. ABSTRACT (200 words or less)

This draft report documents the results of the NRC staff review of new Standard Technical Specifications (STS) proposed by the Westinghouse Owners Group. The new STS were developed based on the criteria in the interim Commission Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, dated February 6, 1987. The new STS will be used as bases for individual nuclear power plant owners to develop improved plant-specific technical specifications. The NRC staff is issuing this draft new STS for a 30 working-day comment period. Following the comment period, the NRC staff will analyze comments received, finalize the new STS, and issue them for plant-specific implementation. This report contains three volumes. Volume 1 contains the Specifications for all sections of the new STS. Volume 2 contains the Bases for Sections 2.0 - 3.3 of the new STS and Volume 3 contains the Bases for Sections 3.4 - 3.9 of the new STS.

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