DCA Part 4
Volume 1
Revision 5.0

Generic Technical Specifications

NuScale Nuclear Power Plants

Volume 1: Specifications

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: a. The use of self-testing features, or application of simulated or actual input combinations as appropriate, to test digital computer hardware; and b. Verification of the required logic output. An ACTUATION LOGIC TEST shall include each possible interlock logic state required for OPERABILITY of a logic circuit. The ACTUATION LOGIC TEST shall verify the OPERABILITY of each manual logic input device required for channel OPERABILITY. The ACTUATION LOGIC TEST shall be conducted such that it provides component overlap with the actuated device. The ACTUATION LOGIC TEST may be performed by means of any series of sequential, overlapping, or total steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step.
ACTUATION RESPONSE TIME	The time from when the Module Protection System equipment interface module output initiates an actuation signal until the actuated valves or breakers reach their final actuated position.
AXIAL OFFSET (AO)	AO shall be the difference in power generated in the top half of the core (P_{top}) and the bottom half of the core (P_{bottom}), divided by the sum of the power generated in the core (P_{total}). $AO = (P_{top} - P_{bottom}) / P_{total}$

1.1 Definitions

CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass all devices in the channel required for channel OPERABILITY. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step.
CHANNEL CHECK	A CHANNEL CHECK shall be the verification through the absence of alarms from the automatic analog and binary process signal monitoring features used to monitor channel behavior during operation. Deviation beyond the established acceptance criteria is alarmed to allow appropriate action to be taken. This determination shall include, where possible, comparison of channel indication and status to other indications or status derived from the independent channels measuring the same parameter. This determination can be made using computer software or be performed manually.
CHANNEL OPERATIONAL TEST (COT)	A COT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of all devices in the channel required for channel OPERABILITY. The COT shall include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. The COT may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step.

1.1 Definitions

CHANNEL RESPONSE TIME	The time from when the process variable exceeds its setpoint until the output from the channel analog logic reaches the input of the digital portion of the Module Protection System digital logic.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit-specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.6.3. Module operation within these parameter limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries per gram) that alone would produce the same committed effective dose equivalent as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Table 2.1 of EPA Federal Guidance Report No. 11, “Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion,” EPA-520/1-88-020, September 1988.
DOSE EQUIVALENT XE-133	DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (microcuries per gram) that alone would produce the same effective dose equivalent as the quantity and isotopic mixture of noble gases (Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, Xe-133m, Xe-133, Xe-135m, Xe-135, and Xe-138) actually present. The dose conversion factors used for this calculation shall be those listed in Table III.1 of EPA Federal Guidance Report No. 12, “External Exposure to Radionuclides in Air, Water, and Soil,” EPA 402-R-93-081, September 1993.
INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

1.1 Definitions

LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE 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, or 2. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System (primary to secondary LEAKAGE), b. Unidentified LEAKAGE All LEAKAGE that is not identified LEAKAGE, and c. Pressure Boundary LEAKAGE LEAKAGE (except primary to secondary LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MODE	A MODE shall correspond to any one inclusive combination of reactivity condition, reactor coolant temperature, control rod assembly (CRA) withdrawal capability, Chemical and Volume Control System (CVCS) and Containment Flood and Drain System (CFDS) configuration, reactor vent valve electrical isolation, and reactor vessel flange bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.
OPERABLE-OPERABILITY	A system, subsystem, separation group, channel, division, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, electrical power, cooling water, lubrication, and other auxiliary equipment that are required for the system, subsystem, separation group, channel, division, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

1.1 Definitions

PASSIVELY COOLED – PASSIVE COOLING	A module is in PASSIVE COOLING or is being PASSIVELY COOLED when: a. Two or more reactor vent valves are open and one or more reactor recirculation valves is open, or b. One or more trains of DHRS is in operation, or c. Water level in the containment vessel is > 45 ft.
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, “Initial Test Program and Inspections, Tests, Analyses, and Acceptance Criteria,” of the FSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit-specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.4.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 160 MWt.

1.1 Definitions

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. Moderator temperature is 420 °F; and b. All control rod assemblies (CRAs) are fully inserted except for the single CRA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CRAs verified fully inserted by two independent means, it is not necessary to account for a stuck CRA in the SDM calculation. With any CRA not capable of being fully inserted, the reactivity worth of the affected CRA must be accounted for in the determination of SDM.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TOTAL RESPONSE TIME	TOTAL RESPONSE TIME is the sum of the CHANNEL RESPONSE TIME, the allocated MPS digital time response, and the ACTUATION RESPONSE TIME. The TOTAL RESPONSE TIME is the time interval from when the monitored parameter exceeds its actuation setpoint at the channel sensor until the actuated component is capable of performing its safety function (i.e., the valves travel to their required positions, breakers are open, etc.)

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTIVITY CONDITION (k_{eff})	INDICATED REACTOR COOLANT TEMPERATURES (°F)
1	Operations	≥ 0.99	All ≥ 420
2	Hot Shutdown	< 0.99	Any ≥ 420
3	Safe Shutdown [(a)]	< 0.99	All < 420
4	Transition [(b)(c)]	< 0.95	N/A
5	Refueling [(d)]	N/A	N/A

(a) Any CRA capable of withdrawal, any CVCS or CFDS connection to the module not isolated.

(b) All CRAs incapable of withdrawal, CVCS and CFDS connections to the module isolated, and all reactor vent valves electrically isolated.

(c) All reactor vessel flange bolts fully tensioned.

(d) One or more reactor vessel flange bolts less than fully tensioned.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

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

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

BACKGROUND

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

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

1.2 Logical Connectors

EXAMPLES The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

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

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

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

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

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

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	Limiting Conditions for Operation (LCOs) specify minimum requirements for ensuring safe operation of the unit. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s).
DESCRIPTION	The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the discovery of a situation (e.g., inoperable equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the unit is in a MODE or specified condition stated in the Applicability of the LCO. Unless otherwise specified, the Completion Time begins when a senior licensed operator on the operating shift crew with responsibility for plant operations makes the determination that an LCO is not met and an ACTIONS Condition is entered. The "otherwise specified" exceptions are varied, such as a Required Action Note or Surveillance Requirement Note that provides an alternative time to perform specific tasks, such as testing, without starting the Completion Time. While utilizing the Note, should a Condition be applicable for any reason not addressed by the Note, the Completion Time begins. Should the time allowance in the Note be exceeded, the Completion Time begins at that point. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the unit is not within the LCO Applicability. If situations are discovered that require entry into more than one Condition at a time within a single LCO (multiple Conditions), the Required Actions for each Condition must be performed within the associated Completion Time. When in multiple Conditions, separate Completion Times are tracked for each Condition starting from the discovery of the situation that required entry into the Condition, unless otherwise specified.

1.3 Completion Times

DESCRIPTION (continued)

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

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

a. Must exist concurrent with the first inoperability; and

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

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

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

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

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

The above Completion Time extension does not apply to a Completion Time with a modified “time zero.” This modified “time zero” may be expressed as a repetitive time (i.e., “once per 8 hours,” where the Completion Time is referenced from a previous completion of the Required Action versus the time of Condition entry) or as a time modified by the phrase “from discovery ....”

1.3 Completion Times

EXAMPLES

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

EXAMPLE 1.3-1

ACTIONS

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

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

The Required Actions of Condition B are to be in MODE 2 within 6 hours AND in MODE 3 in 36 hours. A total of 6 hours is allowed for reaching MODE 2 and a total of 36 hours (not 42 hours) is allowed for reaching MODE 3 from the time that Condition B was entered. If MODE 2 is reached within 3 hours, the time allowed for reaching MODE 3 is the next 33 hours because the total time allowed for reaching MODE 3 is 36 hours.

If Condition B is entered while in MODE 2, the time allowed for reaching MODE 3 is the next 36 hours.

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-2

ACTIONS

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

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

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

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

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

1.3 Completion Times

EXAMPLES (continued)

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

EXAMPLE 1.3-3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Function X train inoperable.	A.1 Restore Function X train to OPERABLE status.	7 days
B. One Function Y train inoperable.	B.1 Restore Function Y train to OPERABLE status.	72 hours
C. One Function X train inoperable. AND One Function Y train inoperable.	C.1 Restore Function X train to OPERABLE status. OR C.2 Restore Function Y train to OPERABLE status.	72 hours 72 hours

1.3 Completion Times

EXAMPLES (continued)

When one Function X train and one Function Y train are inoperable, Condition A and Condition B are concurrently applicable. The Completion Times for Condition A and Condition B are tracked separately for each train starting from the time each train was declared inoperable and the Condition was entered. A separate Completion Time is established for Condition C and tracked from the time the second train was declared inoperable (i.e., the time the situation described in Condition C was discovered).

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

It is possible to alternate between Conditions A, B, and C in such a manner that operation could continue indefinitely without ever restoring the LCO. However, doing so would be inconsistent with the basis of the Completion Times. Therefore, there shall be administrative controls to limit the maximum time allowed for any combination of Conditions that result in a single contiguous occurrence of failing to meet the LCO. These administrative controls shall ensure that the Completion Times for those Conditions are not inappropriately extended.

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-4

ACTIONS

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

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

Once one of the valves has been restored to OPERABLE status, the Condition A Completion Time is not reset, but continues from the time the first valve was declared inoperable. The Completion Time may be extended if the valve restored to OPERABLE status was the first inoperable valve. The Condition A Completion Time may be extended for up to 4 hours provided this does not result in any subsequent valve being inoperable for > 4 hours.

If the Completion Time of 4 hours (including the extension) expires while one or more valves are still inoperable, Condition B is entered.

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-5

ACTIONS

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

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

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

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

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

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-6

ACTIONS

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

Entry into Condition A offers a choice between Required Action A.1 or A.2. Required Action A.1 has a “once per” Completion Time, which qualifies for the 25% extension, per SR 3.0.2, to each performance after the initial performance. The initial 8 hour interval of Required Action A.1 begins when Condition A is entered and the initial performance of Required Action A.1 must be complete within the first 8 hour interval. If Required Action A.1 is followed, and the Required Action is not met within the Completion Time (plus the extension allowed by SR 3.0.2), Condition B is entered. If Required Action A.2 is followed and the Completion Time of 8 hours is not met, Condition B is entered.

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

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-7

ACTIONS

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

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

1.3 Completion Times

EXAMPLES (continued)

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

IMMEDIATE COMPLETION TIME	When “Immediately” is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE

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

DESCRIPTION

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

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

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

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

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

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

1.4 Frequency

DESCRIPTION (continued)

a. The Surveillance is not required to be met in the MODE or other specified condition to be entered; or

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

c. The Surveillance is required to be met, but not performed, in the MODE or other specified condition to be entered, and is known not to be failed.

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

EXAMPLES

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

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Perform CHANNEL CHECK.	12 hours

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

1.4 Frequency

EXAMPLES (continued)

If the interval specified by SR 3.0.2 is exceeded while the unit is not in a MODE or other specified condition in the Applicability of the LCO for which performance of the SR is required, then SR 3.0.4 becomes applicable. The Surveillance must be performed within the Frequency requirements of SR 3.0.2, as modified by SR 3.0.3, prior to entry into the MODE or other specified condition or the LCO is considered not met (in accordance with SR 3.0.1) and LCO 3.0.4 becomes applicable.

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

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

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

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

EXAMPLES (continued)

EXAMPLE 1.4-3

SURVEILLANCE REQUIREMENTS

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

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

As the Note modifies the required performance of the Surveillance, it is construed to be part of the "specified Frequency." Should the 7 day interval be exceeded while operation is < 25% RTP, this Note allows 12 hours after power reaches ≥ 25% RTP to perform the Surveillance. The Surveillance is still considered to be performed within the "specified Frequency." Therefore, if the Surveillance were not performed within the 7 day (plus the extension allowed by SR 3.0.2) interval, but operation was < 25% RTP, it would not constitute a failure of the SR or failure to meet the LCO. Also, no violation of SR 3.0.4 occurs when changing MODES, even with the 7 day Frequency not met, provided operation does not exceed 12 hours (plus the extension allowed by SR 3.0.2) with power ≥ 25% RTP.

Once the unit reaches 25% RTP, 12 hours would be allowed for completing the Surveillance. If the Surveillance were not performed within this 12 hour interval (plus the extension allowed by SR 3.0.2), there would then be a failure to perform a Surveillance within the specified Frequency, and the provisions of SR 3.0.3 would apply.

EXAMPLES (continued)

EXAMPLE 1.4-4

SURVEILLANCE REQUIREMENTS

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

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

EXAMPLES (continued)

EXAMPLE 1.4-5

SURVEILLANCE REQUIREMENTS

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

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

As the Note modifies the required performance of the Surveillance, the Note is construed to be part of the “specified Frequency.” Should the 7 day interval be exceeded while operation is not in MODE 1, this Note allows entry into and operation in MODE 2 to perform the Surveillance. The Surveillance is still considered to be performed within the “specified Frequency” if completed prior to entering MODE 1. Therefore, if the Surveillance were not performed within the 7 day (plus the extension allowed by SR 3.0.2) interval, but operation was not in MODE 1, it would not constitute a failure of the SR or failure to meet the LCO. Also, no violation of SR 3.0.4 occurs when changing MODES, even with the 7 day Frequency not met, provided operation does not result in entry into MODE 1.

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

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-6

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
----------NOTE---------- Not required to be met in MODE 2. ----------	
Verify parameter is within limits.	24 hours

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

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 In MODE 1 the critical heat flux ratio shall be maintained at or above the following correlation safety limits:

Correlation	Safety Limit
NSP2	[1.17]
NSP4	[1.21]
Extended Hench-Levy	[1.06]

2.1.1.2 In MODE 1 the peak fuel centerline temperature shall be maintained ≤ { 4901 - (1.37E-3 × Burnup, MWD/MTU) } °F.

2.1.2 RCS Pressure SL

In MODES 1, 2, and 3 pressurizer pressure shall be maintained ≤ 2285 psia.

2.2 Safety Limit Violations

2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 2 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

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

2.2.2.2 In MODE 2 or 3, restore compliance within 5 minutes.

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1

LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2, [and] LCO 3.0.7[, and LCO 3.0.8].

LCO 3.0.2

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

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

LCO 3.0.3

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

a. MODE 2 within 7 hours; and

b. MODE 3 and PASSIVELY COOLED within 37 hours.

Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1 and 2, and in MODE 3 when not PASSIVELY COOLED.

LCO 3.0.4

When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:

a. 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;

3.0 LCO APPLICABILITY

LCO 3.0.4 (continued)

b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate (exceptions to this Specification are stated in the individual Specifications); or

c. When an allowance is stated in the individual value, parameter, or other Specification.

This Specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

LCO 3.0.5 Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

LCO 3.0.6 When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered. This is an exception to LCO 3.0.2 for the supported system. In this event, an evaluation shall be performed in accordance with Specification 5.5.8, “Safety Function Determination Program (SFDP).” If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

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

3.0 LCO APPLICABILITY

LCO 3.0.7 Test Exception LCO 3.1.8 allows specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with Test Exception LCOs is optional. When a Test Exception LCO is desired to be met but is not met, the ACTIONS of the Test Exception LCO shall be met. When a Test Exception LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall be made in accordance with the other applicable Specifications.

[---------- REVIEWER'S NOTE ----------
A COL applicant who wants to adopt LCO 3.0.8 must perform or reference a risk assessment for the NuScale design that has been submitted to the NRC, and that was prepared consistent with the bounding generic risk assessment provided in TSTF-427-A, Rev. 2, "Allowance for Non-Technical Specification Barrier Degradation on Supported System OPERABILITY."
----------]

[LCO 3.0.8 When one or more required barriers are unable to perform their related support function(s), any supported system LCO(s) are not required to be declared not met solely for this reason for up to 30 days provided that at least one train or subsystem of the supported system is OPERABLE and supported by barriers capable of providing their related support function(s), and risk is assessed and managed. This Specification may be concurrently applied to more than one train or subsystem of a multiple train or subsystem supported system provided at least one train or subsystem of the supported system is OPERABLE and the barriers supporting each of these trains or subsystems provide their related support function(s) for different categories of initiating events.

If the required OPERABLE train or subsystem becomes inoperable while this Specification is in use, it must be restored to OPERABLE status within 24 hours or the provisions of this Specification cannot be applied to the trains or subsystems supported by the barriers that cannot perform their related support function(s).

At the end of the specified period, the required barriers must be able to perform their related support function(s) or the supported system LCO(s) shall be declared not met.]

3.0 SURVEILLANCE REQUIREMENTS (SR) APPLICABILITY

SR 3.0.1

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

SR 3.0.2

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

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

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

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3

If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. The delay period is only applicable when there is a reasonable expectation the Surveillance will be met when performed. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

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

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

3.0 SR APPLICABILITY

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability of a LCO shall only be made when the LCO's Surveillances have been met within their specified frequency, except as provided by SR 3.0.3. When an LCO is not met due to Surveillances not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with LCO 3.0.4.

This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

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

APPLICABILITY: MODE 1 with k_{eff} < 1.0,
MODES 2, 3, and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	----------NOTE---------- Not required to be performed in MODE 4. ---------- Verify SDM to be within limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 Core Reactivity

LCO 3.1.2 The core reactivity balance shall be within ±1% Δk/k of the normalized predicted values.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Core reactivity balance not within limit.	A.1	Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation.	7 days
	AND		
	A.2	Establish appropriate operating restrictions.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	----------NOTE---------- Predicted reactivity values may be adjusted to correspond to measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPDs) after each refueling. ---------- Verify overall core reactivity balance is within ±1% Δk/k of predicted values.	Once prior to exceeding 5% RTP after each refueling AND --------NOTE-------- Only required after 60 EFPDs. ---------- In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Moderator Temperature Coefficient (MTC)

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

APPLICABILITY: MODE 1 for upper MTC limit,
MODES 1 and 2 for lower MTC limit,
MODE 3 with any RCS temperature ≥ 200 °F for lower MTC limit.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. MTC not within limits.	A.1	Be in MODE 2.	6 hours
B. MTC not within lower limit.	B.1	Be in MODE 3 with all RCS temperatures < 200 °F.	48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify MTC is within the upper limit.	Once prior to exceeding 5% RTP after each refueling
SR 3.1.3.2	Verify MTC is within the lower limit.	Once within 7 effective full power days (EFPDs) after reaching 40 EFPDs fuel burnup from beginning of cycle (BOC) AND Once within 7 EFPDs after reaching 2/3 fuel burnup from BOC AND -------NOTE------- Only required when projected end of cycle MTC is not within limit. ---------- 7 EFPDs thereafter

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits

LCO 3.1.4 All shutdown and regulating control rod assemblies (CRAs) shall be OPERABLE.

AND

Individual CRA positions shall be within 6 steps of their group position.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more CRAs inoperable. OR One or more CRAs not within alignment limits.	A.1.1 Verify SDM to be within limits specified in the COLR. OR A.1.2 Initiate boration to restore SDM to within limit. AND A.2 Be in MODE 2.	1 hour 1 hour 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	----------NOTE---------- Not required to be performed for CRAs associated with an inoperable rod position indicator. ---------- Verify position of individual CRAs within alignment limit.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.2	Verify CRA freedom of movement (trippability) by moving each CRA not fully inserted in the core ≥ 4 steps in either direction.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.3	Verify each CRA drop time is ≤ 2.2 seconds.	Prior to reactor criticality after each removal of the upper reactor pressure vessel section

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

LCO 3.1.5 Each shutdown bank group shall be within insertion limits specified in the COLR.

APPLICABILITY: MODE 1.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown groups not within insertion limits.	A.1.1 Verify SDM is within the limits specified in the COLR. OR A.1.2 Initiate boration to restore SDM to within limit. AND A.2 Restore shutdown groups to within limits.	1 hour 1 hour 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank group is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Regulating Bank Insertion Limits

LCO 3.1.6 Each regulating bank group shall be within the insertion limits specified in the COLR.

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

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more regulating groups not within insertion limits.	A.1.1 Verify SDM is within the limits specified in the COLR. OR A.1.2 Initiate boration to restore SDM to within limits. AND A.2 Restore regulating groups to within limits.	1 hour 1 hour 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 1 with $k_{eff} < 1.0$.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify each regulating bank group is within the insertion limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication (RPI)

LCO 3.1.7 The Control Rod Drive System (CRDS) Rod Position Indicators (RPIs) and the Control Rod Assembly (CRA) Counter Position Indicators (CPIs) shall be OPERABLE.

APPLICABILITY: MODE 1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each CRDS rod position indicator and each CRA counter position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RPI per CRDM inoperable for one or more CRDMs.	A.1 Verify the position of the CRA with inoperable position indicators with the Module Control System (MCS).	Once per 8 hours
B. More than one RPI per CRDM inoperable.	B.1 Place the CRA under manual control. AND B.2 Verify the position of the CRA with inoperable CRDS position indicators indirectly by using the in-core neutron detectors. AND	Immediately Once per 8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Restore inoperable rod position indicators to OPERABLE status such that a maximum of one RPI per CRDM is inoperable.	24 hours
C. One or more control rod drive mechanisms (CRDMs) with inoperable position indicators have been moved in excess of 6 steps in one direction since the last determination of the CRA's position.	C.1 Verify the position of the CRAs with inoperable position indicators by using the MCS.	4 hours
D. CRA CPI position indicator inoperable for one or more CRAs.	D.1 Verify by administrative means all RPIs for the affected groups are OPERABLE. AND D.2 Verify the most withdrawn CRA and the least withdrawn CRA of the affected groups are ≤ 6 steps apart.	Once per 8 hours Once per 8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify each RPI channel agrees within 6 steps of the group counter position indication for the full indicated range of CRA travel.	Prior to criticality after coupling a CRA to the associated CRDM for one or more CRAs

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions

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

LCO 3.1.3, "Moderator Temperature Coefficient (MTC),"
LCO 3.1.4, "Rod Group Alignment Limits,"
LCO 3.1.5, "Shutdown Bank Insertion Limits," and
LCO 3.1.6, "Regulating Bank Insertion Limits"

may be suspended provided:

a. SDM is within the limits specified in the COLR, and

b. THERMAL POWER is ≤ 5% RTP.

APPLICABILITY: During PHYSICS TESTS initiated in MODE 1.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify THERMAL POWER is ≤ 5% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.2	Verify SDM is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 Boron Dilution Control

LCO 3.1.9 Two CVCS demineralized water isolation valves shall be OPERABLE.

AND

Boric Acid supply boron concentration shall be within the limits specified in the COLR.

AND

Maximum CVCS makeup pump demineralized water flow path flowrate shall be within the limits specified in the COLR.

APPLICABILITY: MODES 1, 2, and 3 with any dilution source flow path in the CVCS makeup line not isolated.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CVCS demineralized water isolation valve inoperable.	A.1 Restore CVCS demineralized water isolation valves to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met. OR Two CVCS demineralized water isolation valves inoperable. OR Boric Acid supply boron concentration not within limits. OR CVCS makeup pump demineralized water flow path not configured to ensure maximum flowrate is within limits.	B.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate dilution source flow paths in the CVCS makeup line by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify that CVCS makeup pump demineralized water flow path is configured to ensure that the maximum demineralized water flowrate remains within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.1.9.2	Verify each automatic CVCS demineralized water isolation valve that is not locked, sealed, or otherwise secured in the isolated position, actuates to the isolated position on an actual or simulated signal.	In accordance with the Surveillance Frequency Control Program
SR 3.1.9.3	Verify Boric Acid supply boron concentration is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.1.9.4	Verify each CVCS makeup pump maximum flowrate is ≤ 25 gpm.	In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Enthalpy Rise Hot Channel Factor ($F_{\Delta H}$)

LCO 3.2.1 $F_{\Delta H}$ shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 25% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. $F_{\Delta H}$ not within limit.	A.1 Reduce THERMAL POWER to < 25% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_{\Delta H}$ is within the limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 25% RTP AND In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.2 AXIAL OFFSET (AO)

LCO 3.2.2 The AO shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 25% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. AO not within limits.	A.1	Reduce THERMAL POWER to < 25% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify AO within limits using in-core instrumentation neutron detectors.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.1 Module Protection System (MPS) Instrumentation

LCO 3.3.1 MPS instrumentation channels required for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

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

1. Separate Condition entry is allowed for each Function.
2. Separate Condition entry is allowed for each steam generator for Functions 16, 17, 18, 19, and 20.
3. Separate Condition entry is allowed for each ELVS battery charger of Function 25.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel inoperable.	A.1 Place inoperable channel in bypass or trip.	6 hours
B. One or more Functions with two channels inoperable.	B.1 Place one inoperable channel in bypass. AND B.2 Place one inoperable channel in trip.	6 hours 6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. OR One or more Functions with three or more channels inoperable.	C.1 Enter Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.1-1.	D.1 Open reactor trip breakers.	6 hours
E. As required by Required Action C.1 and referenced in Table 3.3.1-1.	E.1 Reduce THERMAL POWER to below the N-2H interlock.	6 hours
F. As required by Required Action C.1 and referenced in Table 3.3.1-1.	F.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate the flow paths between the CVCS and the Reactor Coolant System by use of at least one closed manual or one closed and de-activated automatic valve.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. As required by Required Action C.1 and referenced in Table 3.3.1-1.	G.1	----------NOTE---------- Pressurizer heater breakers may be closed intermittently under administrative controls. ---------- Open pressurizer heater breakers.	6 hours
H. As required by Required Action C.1 and referenced in Table 3.3.1-1.	H.1	Isolate dilution source flow paths in the CVCS makeup line by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour
I. As required by Required Action C.1 and referenced in Table 3.3.1-1.	I.1 AND I.2	Be in MODE 2. Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours
J. As required by Required Action C.1 and referenced in Table 3.3.1-1.	J.1	Open two reactor vent valves.	1 hour
K. As required by Required Action C.1 and referenced in Table 3.3.1-1.	K.1 AND K.2	Be in MODE 2. Be in MODE 3 with RCS temperature below the T-2 interlock.	6 hours 48 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
L. As required by Required Action C.1 and referenced in Table 3.3.1-1.	L.1	Be in MODE 2.	72 hours
	AND		
	L.2	Be in MODE 3 and PASSIVELY COOLED.	96 hours
	AND		
	L.3	Be in MODE 3 with RCS temperature below the T-2 interlock.	96 hours
	AND		
	L.4	Isolate dilution source flow paths in the CVCS makeup line by use of at least one closed manual or one closed and de-activated automatic valve.	96 hours
	AND		
	L.5	Open pressurizer heater breakers.	96 hours
M. As required by Required Action C.1 and referenced in Table 3.3.1-1.	M.1	Be in MODE 2.	6 hours
	AND		
	M.2	Be in MODE 3 with RCS temperature below the T-3 interlock.	48 hours
N. As required by Required Action C.1 and referenced in Table 3.3.1-1.	N.1	Be in MODE 2 with RCS temperature below the T-6 interlock.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2	----------NOTES---------- 1. Adjust Neutron Monitoring System (NMS) nuclear instrument channel when absolute difference is > 1% RTP. 2. Not required to be performed until 12 hours after reaching 15% RTP. 3. If the calorimetric heat balance is < 50% RTP, and if NMS nuclear instrumentation channel indicated power is: a. lower than the calorimetric measurement by > 1%, then adjust the NMS nuclear instrumentation channel upward to match the calorimetric measurement. b. higher than the calorimetric measurement, then no adjustment is required. ---------- Compare results of calorimetric heat balance to NMS nuclear instrument channel output.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3	----------NOTE---------- Neutron detectors are excluded from response time testing. ---------- Verify CHANNEL RESPONSE TIME is within limits. The CHANNEL RESPONSE TIME is combined with the allocated MPS digital time response and the ACTUATION RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.4	----------NOTE---------- Neutron detectors are excluded from the CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION in accordance with the Setpoint Program.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.5	Perform CHANNEL CALIBRATION on each required Class 1E isolation device.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1-1 (page 1 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
1. High Power Range Linear Power			
a. RTS	1, 2[(a)], 3[(a)]	4	D
b. DWSI	1, 2[(a)], 3[(a)]	4	H
2. High Power Range Positive and Negative Rate			
a. RTS	1[(b)]	4	E
b. DWSI	1[(b)]	4	H
3. High Intermediate Range Log Power Rate			
a. RTS	1[(c)], 2[(a)], 3[(a)]	4	D
b. DWSI	1[(c)], 2[(a)], 3[(a)]	4	H
4. High Source Range Count Rate			
a. RTS	1[(d)], 2[(a)], 3[(a)]	4	D
b. DWSI	1[(d)], 2[(a)], 3[(a)]	4	H
5. High Source Range Log Power Rate			
a. RTS	1[(d)], 2[(a)], 3[(a)]	4	D
b. DWSI	1[(d)], 2[(a)], 3[(a)]	4	H
6. High Subcritical Multiplication			
a. DWSI	1[(d)], 2, 3	4	H

(a) When capable of CRA withdrawal.
(b) With power above the N-2H interlock.
(c) With power below the N-2L interlock.
(d) When Intermediate Range Log Power less than N-1 interlock.

Table 3.3.1-1 (page 2 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
7. High Pressurizer Pressure			
a. RTS	1, 2[a], 3[a]	4	D
b. DHRS	1, 2, 3[e]	4	I
c. Pressurizer Heater Trip	1, 2[f], 3[f]	4	G
d. DWSI	1, 2[a], 3[a]	4	H
e. SSI	1, 2, 3[e]	4	I
8. Low Pressurizer Pressure			
a. RTS	1[g]	4	D
b. DWSI	1[g]	4	H
9. Low Low Pressurizer Pressure			
a. RTS	1, 2[a], 3[a]	4	D
b. CVCSI	1, 2, 3[a]	4	F
c. DWSI	1, 2[a], 3[a]	4	H
d. SSI	1, 2, 3[a]	4	I
10. High Pressurizer Level			
a. RTS	1, 2[a], 3[a]	4	D
b. CVCSI	1, 2, 3	4	F
c. DWSI	1, 2[a], 3[a]	4	H

(a) When capable of CRA withdrawal.
(e) When not PASSIVELY COOLED.
(f) With pressurizer heater breakers closed.
(g) With narrow range RCS hot temperature above the T-4 interlock.

Table 3.3.1-1 (page 3 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
11. Low Pressurizer Level			
a. RTS	1, 2[a], 3[a]	4	D
b. Pressurizer Heater Trip	1, 2[f], 3[f]	4	G
c. DWSI	1, 2[a], 3[a]	4	H
12. Low Low Pressurizer Level			
a. CIS	1, 2, 3[h]	4	K
b. CVCSI	1, 2, 3[h]	4	F
c. SSI	1, 2, 3[h]	4	I
13. High Narrow Range RCS Hot Temperature			
a. RTS	1	4	D
b. DHRS	1, 2, 3[e]	4	I
c. Pressurizer Heater Trip	1, 2[f], 3[f]	4	G
d. DWSI	1	4	H
e. SSI	1, 2, 3[e]	4	I
14. Low RCS Flow			
a. DWSI	1, 2, 3	4	H
15. Low Low RCS Flow			
a. RTS	1, 2[a], 3[a]	4	D
b. CVCSI	1, 2[a], 3[a]	4	F
c. DWSI	1, 2[a], 3[a]	4	H

(a) When capable of CRA withdrawal.
(e) When not PASSIVELY COOLED.
(f) With pressurizer heater breakers closed.
(h) With RCS temperature above the T-2 interlock and containment water level below the L-1 interlock.

Table 3.3.1-1 (page 4 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
16. High Main Steam Pressure			
a. RTS	1, 2[a]	4 per SG	D
b. DHRS	1, 2, 3[e]	4 per SG	I
c. Pressurizer Heater Trip	1, 2[f], 3[f]	4 per SG	G
d. DWSI	1, 2[a]	4 per SG	H
e. SSI	1, 2, 3[e]	4 per SG	I
17. Low Main Steam Pressure			
a. RTS	1[b]	4 per SG	E
b. DWSI	1[b]	4 per SG	H
c. SSI	1[b]	4 per SG	E
18. Low Low Main Steam Pressure			
a. RTS	1, 2[a], 3[a]	4 per SG	D
b. DWSI	1, 2[a], 3[a]	4 per SG	H
c. SSI	1, 2[i], 3[i]	4 per SG	I
19. High Steam Superheat			
a. RTS	1	4 per SG	D
b. DWSI	1	4 per SG	H
c. SSI	1	4 per SG	I

(a) When capable of CRA withdrawal.
(b) With power above the N-2H interlock.
(e) When not PASSIVELY COOLED.
(f) With pressurizer heater breakers closed.
(i) With containment water level below the L-1 interlock.

Table 3.3.1-1 (page 5 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
20. Low Steam Superheat			
a. RTS	1[j]	4 per SG	D
b. DWSI	1[j]	4 per SG	H
c. SSI	1[k]	4 per SG	I
21. High Narrow Range Containment Pressure			
a. RTS	1, 2[a], 3[a]	4	D
b. CIS	1, 2, 3[l]	4	M
c. CVCSI	1, 2, 3[l]	4	F
d. DWSI	1, 2[a], 3[a]	4	H
e. SSI	1, 2, 3[m]	4	I
22. High Containment Water Level			
a. ECCS	1, 2, 3[n]	4	I
23. Low RCS Pressure - ECCS			
a. ECCS	1[o], 2[o]	4	N
24. High RCS Pressure – Low Temperature Overpressure Protection			
a. LTOP	3[p]	4	J

(a) When capable of CRA withdrawal.
(j) With power above the N-2H interlock or V-1 not active (both FWIVs open).
(k) With containment level below the L-1 interlock with reactor power above the N-2H interlock, or with containment water level below the L-1 interlock with V-1 not active (both FWIVs open).
(l) With RCS temperature above the T-3 interlock.
(m) With RCS temperature above the T-3 interlock and containment water level below the L-1 interlock.
(n) With RCS temperature above the T-3 interlock or pressurizer water level below the L-2 interlock.
(o) With RCS temperature above the T-6 interlock.
(p) With wide range RCS cold temperature below the LTOP enable temperature specified in the PTLR (T-1 interlock) and more than one reactor vent valve closed.

Table 3.3.1-1 (page 6 of 6)
Module Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
25. Low AC Voltage to ELVS Battery Chargers			
a. RTS	1, 2[a], 3[a]	4 per bus	L
b. DHRS	1, 2, 3[e]	4 per bus	L
c. CIS	1, 2, 3	4 per bus	L
d. CVCSI	1, 2, 3	4 per bus	F
e. DWSI	1, 2[a], 3[a]	4 per bus	L
f. Pressurizer Heater Trip	1, 2[f]	4 per bus	L
g. SSI	1, 2, 3[e]	4 per bus	L
26. High Under-the-Bioshield Temperature			
a. RTS	1, 2[a], 3[a]	4	L
b. CIS	1, 2, 3	4	L
c. CVCSI	1, 2, 3	4	F
d. DWSI	1, 2[a], 3[a]	4	L
e. SSI	1, 2, 3[e]	4	L

(a) When capable of CRA withdrawal.
(e) When not PASSIVELY COOLED.
(f) With pressurizer heater breakers closed.

3.3 INSTRUMENTATION

3.3.2 Reactor Trip System (RTS) Logic and Actuation

LCO 3.3.2 Two Reactor Trip System (RTS) Logic and Actuation divisions shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 when capable of CRA withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One reactor trip breaker (RTB) inoperable.	A.1 Open the inoperable RTB.	48 hours
B. One division of RTS Logic and Actuation inoperable.	B.1 Restore division of RTS Logic and Actuation to OPERABLE status.	6 hours
C. Required Action and associated Completion Time not met. OR Both divisions of RTS Logic and Actuation inoperable. OR More than one RTB inoperable.	C.1 Open all RTBs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2	Verify ACTUATION RESPONSE TIME is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.3	Perform CHANNEL CALIBRATION on each Class 1E isolation device.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.4	Verify each RTB actuates to the open position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.3 Engineered Safety Features Actuation System (ESFAS) Logic and Actuation

LCO 3.3.3 Engineered Safety Features Actuation System (ESFAS) Logic and Actuation divisions required for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.3-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LTOP Actuation Function with one or both Logic and Actuation divisions inoperable.	A.1 Open two reactor vent valves (RVVs).	1 hour
B. One or more Actuation Functions, other than the LTOP Actuation Function, with one ESFAS Logic and Actuation division inoperable.	B.1 Enter the Condition Referenced in Table 3.3.3-1 for the affected Function.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action B.1 and referenced in Table 3.3.3-1. OR Both divisions of ECCS Actuation Function inoperable. OR Both divisions of DHRS Actuation Function inoperable. OR Both divisions of SSI Actuation Function inoperable.	C.1 Be in MODE 2. AND C.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours
D. As required by Required Action B.1 and referenced in Table 3.3.3-1. OR Both divisions of Containment Isolation Actuation Function inoperable.	D.1 Be in MODE 3 with containment isolated.	48 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action B.1 and referenced in Table 3.3.3-1. OR Both divisions of Demineralized Water Supply Isolation Actuation Function inoperable.	E.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate dilution source flow paths in the CVCS makeup line by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour
F. As required by Required Action B.1 and referenced in Table 3.3.3-1. OR Both divisions of CVCS Isolation Actuation Function inoperable.	F.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate the flow paths between the CVCS and the Reactor Coolant System by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour
G. As required by Required Action B.1 and referenced in Table 3.3.3-1. OR Both divisions of Pressurizer Heater Trip Actuation Function inoperable.	G.1 ----------NOTE---------- Pressurizer heater breakers may be closed intermittently under administrative controls. ---------- Open pressurizer heater breakers.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2	Verify pressurizer heater breaker ACTUATION RESPONSE TIME is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.3	Perform CHANNEL CALIBRATION on each Class 1E isolation device.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.4	Verify each pressurizer heater breaker actuates to the open position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1 (page 1 of 1)
ESFAS Logic and Actuation Functions

ACTUATION FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED DIVISIONS	CONDITIONS
1. Emergency Core Cooling System (ECCS)	1, 2, 3[(a)]	2	C
2. Decay Heat Removal System (DHRS)	1, 2, 3[(a)]	2	C
3. Containment Isolation System (CIS)	1, 2, 3	2	D
4. Demineralized Water Supply Isolation (DWSI)	1, 2, 3	2	E
5. CVCS Isolation (CVCSI)	1, 2, 3	2	F
6. Pressurizer Heater Trip	1, 2[(b)], 3[(b)]	2	G
7. Low Temperature Overpressure Protection (LTOP)	3[(c)]	2	A
8. Secondary System Isolation (SSI)	1, 2, 3[(a)]	2	C

(a) When not PASSIVELY COOLED.
(b) With pressurizer heater breakers closed.
(c) With wide range RCS cold temperature below the LTOP enable temperature specified in the PTLR (T-1 interlock) and more than one reactor vent valve closed.

3.3 INSTRUMENTATION

3.3.4 Manual Actuation Functions

LCO 3.3.4 Each manual actuation division for each Function in Table 3.3.4-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.4-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one manual actuation division inoperable.	A.1 Enter the Condition referenced in Table 3.3.4-1 for the affected Function.	48 hours
B. One or more Functions with two manual actuation divisions inoperable.	B.1 Enter the Condition referenced in Table 3.3.4-1 for the affected Function.	6 hours
C. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	C.1 Open reactor trip breakers.	Immediately
D. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	D.1 Be in MODE 2. AND D.2 Be in MODE 3 and PASSIVELY COOLED.	24 hours 72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	E.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate dilution source flow paths in the CVCS makeup line by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour
F. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	F.1 ----------NOTE---------- Flow paths may be unisolated intermittently under administrative controls. ---------- Isolate the flow paths between the CVCS and the Reactor Coolant System by use of at least one closed manual or one closed and de-activated automatic valve.	1 hour
G. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	G.1 ----------NOTE---------- Pressurizer heater breakers may be closed intermittently under administrative controls. ---------- Open pressurizer heater breakers.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action A.1 or B.1 and referenced in Table 3.3.4-1.	H.1 Open two reactor vent valves.	Immediately
I. As required by Required Action A.1 or B.1 and Referenced in Table 3.3.4 1.	I.1 Be in MODE 3 with containment isolated.	48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform actuation device operational test.	In accordance with the Surveillance Frequency Control Program

Table 3.3.4-1 (page 1 of 1)
Manual Actuation Functions

MANUALLY ACTUATED FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED DIVISIONS	CONDITIONS
1. Reactor Trip System	1, 2[(a)], 3[(a)]	2	C
2. Emergency Core Cooling System	1, 2, 3[(b)]	2	D
3. Decay Heat Removal System	1, 2, 3[(b)]	2	D
4. Containment Isolation System	1, 2, 3	2	I
5. Demineralized Water Supply Isolation	1, 2, 3	2	E
6. CVCS Isolation System	1, 2, 3	2	F
7. Pressurizer Heater Trip	1, 2[(c)], 3[(c)]	2	G
8. Low Temperature Overpressure Protection	3[(d)]	2	H
9. Secondary System Isolation (SSI)	1, 2, 3[(b)]	2	D

(a) When capable of CRA withdrawal.
(b) When not PASSIVELY COOLED.
(c) With pressurizer heater breakers closed.
(d) With wide range RCS cold temperature below the LTOP enable temperature specified in the PTLR (T-1 interlock) and more than one reactor vent valve closed.

3.3 INSTRUMENTATION

3.3.5 Remote Shutdown Station (RSS)

LCO 3.3.5 Instrumentation in the RSS shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Instrumentation in the RSS inoperable.	A.1 Restore to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform transfer protocol of required functions.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2	Verify that the RSS communicates indication with each required function of the Module Control System and Plant Control System.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3	Verify the OPERABILITY of the RSS hardware and software.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Resistance Critical Heat Flux (CHF) Limits

LCO 3.4.1 Each RCS CHF parameter shall be within the limits specified in the COLR:

a. Pressurizer pressure,

b. RCS cold temperature, and

c. RCS flow resistance.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS pressurizer pressure or RCS cold temperature CHF parameters not within limits.	A.1 Restore RCS CHF parameter(s) to within limit.	2 hours
B. RCS flow resistance not within limits.	B.1 Evaluate flow resistance effect on safety analysis and verify that the reactor coolant system flow rate is acceptable for continued operation.	7 days
C. Required Action and associated Completion Time not met.	C.1 Be in Mode 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is greater than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.2	Verify RCS cold temperature is less than or equal to the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.3	----------NOTE---------- Not required to be performed until 96 hours after exceeding 50% RTP. ---------- Verify RCS flow resistance is within the limits specified in the COLR.	Once prior to exceeding 75% RTP after each refueling

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 All RCS temperatures shall be ≥ 420 °F.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS temperatures not within limit.	A.1 Be in MODE 2.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify all RCS temperatures ≥ 420 °F.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

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

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Required Action A.2 shall be completed whenever this Condition is entered. ---------- Requirements of LCO not met in MODE 1, 2, or 3.	A.1 Restore parameters to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 with RCS pressure < 500 psia.	6 hours 36 hours
C. ----------NOTE---------- Required Action C.2 shall be completed whenever this Condition is entered. ---------- Requirements of LCO not met any time in other than MODE 1, 2, or 3.	C.1 Initiate action to restore parameter(s) to within limits. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 3

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Containment flooding initiated while RCS temperature greater than allowed by PTLR.	D.1	Be in MODE 2.	Immediately
	AND		
	D.2	Be in MODE 3 with RCS temperature less than or equal to the containment flooding RCS temperature limit allowed by the PTLR.	36 hours
	AND		
	D.3	Determine RCS is acceptable for continued operation.	Prior to entering MODE 2 from MODE 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and inservice leak and hydrostatic testing. ----------	
	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within limits specified in the PTLR.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 Reactor Safety Valves (RSVs)

LCO 3.4.4 Two RSVs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS cold temperature above the low temperature overpressure protection (LTOP) interlock T-1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RSV inoperable.	A.1 Restore valve to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met. OR Two RSVs inoperable.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 with RCS cold temperature below LTOP enable interlock T-1 temperature.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify each RSV is OPERABLE in accordance with the INSERVICE TESTING PROGRAM. Following testing, lift settings shall be within 1% of the nominal setpoints of 2075 psia and 2100 psia as shown below: Valve 1 Setpoint: ≥ 2055 psia and ≤ 2095 psia. Valve 2 Setpoint: ≥ 2079 psia and ≤ 2121 psia.	In accordance with the INSERVICE TESTING PROGRAM

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Operational LEAKAGE

LCO 3.4.5 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE,

b. 0.5 gpm unidentified LEAKAGE,

c. 2 gpm identified LEAKAGE from the RCS, and

d. 150 gallons per day primary to secondary LEAKAGE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS hot temperature ≥ 200 °F.

----------NOTE----------
This LCO is not applicable if one or more ECCS valves is open.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR Pressure boundary LEAKAGE exists. OR Primary to secondary LEAKAGE not within limit.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 with RCS hot temperature < 200 °F.	6 hours 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	----------NOTES---------- 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. ---------- Verify RCS Operational LEAKAGE is within limits by performance of RCS water inventory balance.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	----------NOTE---------- Not required to be performed until 12 hours after establishment of steady state operation. ---------- Verify primary to secondary LEAKAGE is ≤ 150 gallons per day through the Steam Generator System.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 Chemical and Volume Control System (CVCS) Isolation Valves

LCO 3.4.6 Each of the following CVCS line flow path isolation valves shall be OPERABLE:

a. RCS Injection Isolation Valves,

b. RCS Discharge Isolation Valves,

c. Pressurizer Spray Isolation Valves, and

d. RPV High Point Degasification Isolation Valves.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

1. CVCS flow paths may be unisolated intermittently under administrative controls.

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more CVCS flow paths with one CVCS valve inoperable.	A.1 Isolate the affected CVCS flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected CVCS flow path is isolated.	Once per 31 days
B. One or more CVCS flow paths with two CVCS valves inoperable.	B.1	Isolate the affected CVCS flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
C. Required Action and associated Completion Time not met.	C.1 <u>AND</u> C.2	Be in MODE 2. Be in MODE 3 with RCS hot temperature < 200 °F.	6 hours 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify [required] valves accumulator pressures are within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.4.6.2	Verify the isolation ACTUATION RESPONSE TIME of each automatic power operated CVCS valve is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.6.3	Verify each automatic CVCS valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Leakage Detection Instrumentation

LCO 3.4.7 Two of the following RCS leakage detection instrumentation methods shall be OPERABLE:

a. Two Containment Evacuation System (CES) condensate channels,

b. Two CES inlet pressure channels, and

c. One CES gaseous radioactivity monitor channel.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS hot temperature ≥ 200 °F.

----------NOTES----------
1. Not required when one or more ECCS valves open.

2. Not required in MODE 3 during containment flood operations.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each condensate channel and each pressure channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required leakage detection instrumentation methods with one required channel inoperable.	A.1 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.5.1.	Once per 24 hours
	AND	
	A.2 Restore required leakage detection channel(s) to OPERABLE status.	14 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required leakage detection instrumentation method with all required channels inoperable.	B.1 Restore one channel of affected required leakage detection instrumentation method to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met. OR Two required leakage detection instrumentation methods with all required channels inoperable.	C.1 Be in MODE 2. AND C.2 Be in MODE 3 with RCS hot temperature < 200 °F.	6 hours 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Perform a CHANNEL CHECK of each required CES condensate channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.2	Perform a CHANNEL CHECK of each required CES inlet pressure channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.7.3	Perform a CHANNEL CHECK of required CES gaseous radioactivity monitor channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.4	Perform a COT of required CES gaseous radioactivity monitor channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.5	Perform a COT of each required CES condensate channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.6	Perform a CHANNEL CALIBRATION of each required CES condensate channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.7	Perform a CHANNEL CALIBRATION of each required CES inlet pressure channel.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.8	Perform a CHANNEL CALIBRATION of required CES gaseous radioactivity monitor channel.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Specific Activity

LCO 3.4.8 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 3.7E-2 µCi/gm.	----------NOTE---------- LCO 3.0.4.c is applicable. ----------	
	A.1 Verify DOSE EQUIVALENT I-131 ≤ 2.2 µCi/gm.	Once per 4 hours
	AND	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. DOSE EQUIVALENT XE-133 > 10 µCi/gm.	----------NOTE---------- LCO 3.0.4.c is applicable. ----------	
	B.1 Restore DOSE EQUIVALENT XE-133 to within limit.	48 hours
C. Required Action and associated Completion Time of Condition A or B not met. OR DOSE EQUIVALENT I-131 > 2.2 µCi/gm.	C.1 Be in MODE 2.	6 hours
	AND	
	C.2 Be in MODE 3.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 10 µCi/gm.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.2	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 3.7E-2 µCi/gm.	In accordance with the Surveillance Frequency Control Program AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% of RTP within a 1 hour period

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Steam Generator (SG) Tube Integrity

LCO 3.4.9 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube plugging criteria shall be plugged in accordance with the Steam Generator Program.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube plugging criteria and not plugged in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG tube inspection. AND A.2 Plug the affected tube(s) in accordance with the Steam Generator Program.	7 days Prior to entering MODE 3 following the next refueling outage or SG tube inspection
B. Required Action and associated Completion Time of Condition A not met. OR SG tube integrity not maintained.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.9.2	Verify that each inspected SG tube that satisfies the tube plugging criteria is plugged in accordance with the Steam Generator Program.	Prior to entering MODE 3 following a SG tube inspection

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Low Temperature Overpressure Protection (LTOP) Valves

LCO 3.4.10 Each closed reactor vent valve (RVV) shall be OPERABLE.

APPLICABILITY: MODE 3 with wide range RCS cold temperature below T-1 interlock.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Not applicable with two RVVs open. ---------- One closed RVV inoperable.	A.1 Restore RVV to OPERABLE status. OR A.2 Open inoperable RVV.	72 hours 72 hours
B. Two closed RVVs inoperable.	B.1 Restore two closed RVVs to OPERABLE status. OR B.2 Open two RVVs.	4 hours 4 hours
C. Three closed RVVs inoperable.	C.1 Initiate action to depressurize RCS. AND C.2 Initiate action to open two RVVs.	2 hours 2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify each RVV actuates to the open position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.4.10.2	Verify the open ACTUATION RESPONSE TIME of each RVV is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.10.3	Verify the inadvertent actuation block setpoints are within limits, and the inadvertent actuation block function of each RVV.	In accordance with the INSERVICE TESTING PROGRAM

3.5 PASSIVE CORE COOLING SYSTEM (PCCS)

3.5.1 Emergency Core Cooling System (ECCS)

LCO 3.5.1 Three reactor vent valves (RVV) and two reactor recirculation valves (RRV) shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RVV inoperable.	A.1	Restore RVV to OPERABLE status.	72 hours
B. One RRV inoperable.	B.1	Restore RRV to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met. OR Two or more RVVs inoperable. OR Two RRVs inoperable.	C.1 AND C.2	Be in MODE 2. Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each RVV and RRV actuates to the open position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify the open ACTUATION RESPONSE TIME of each RVV and RRV is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.5.1.3	Verify the inadvertent actuation block setpoints are within limits, and the inadvertent actuation block function of each RVV and RRV.	In accordance with the INSERVICE TESTING PROGRAM

3.5 PASSIVE CORE COOLING SYSTEMS (PCCS)

3.5.2 Decay Heat Removal System (DHRS)

LCO 3.5.2 Two DHRS loops shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DHRS loop inoperable.	A.1 Restore DHRS loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met. OR Both DHRS loops inoperable.	B.1 Be in MODE 2. AND B.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify [required] valves accumulator pressures are within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify DHRS heat exchangers are filled.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	----------NOTE---------- Not required to be performed for DHRS loop with associated FWIV open. ---------- Verify SG level is > [5]% and ≤ [65]%.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify that each DHRS actuation valve actuates to the open position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Verify the open ACTUATION RESPONSE TIME of each DHRS actuation valve is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM

3.5 PASSIVE CORE COOLING SYSTEMS (PCCS)

3.5.3 Ultimate Heat Sink

LCO 3.5.3 Ultimate Heat Sink shall be maintained within the limits specified below:

a. Level ≥ 68 ft,

b. Bulk average temperature ≥ 65 °F and ≤ 110 °F, and

c. Bulk average boron concentration shall be maintained within the limit specified in the COLR.

APPLICABILITY: At all times.

ACTIONS

----------NOTE----------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Ultimate Heat Sink Level < 68 ft.	A.1	Suspend module movements.	Immediately
	AND		
	A.2	Suspend movement of irradiated fuel assemblies in the refueling area.	Immediately
	AND		
	A.3	Restore Ultimate Heat Sink Level to within limits.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Ultimate Heat Sink Level ≤ 65 ft.	B.1	Initiate action to restore Ultimate Heat Sink Level to > 65 ft.	Immediately
	AND		
	B.2	Restore Ultimate Heat Sink Level to > 65 ft.	24 hours
C. Ultimate Heat Sink bulk average temperature not within limits.	C.1	Suspend module movements.	Immediately
	AND		
	C.2	Initiate action to restore Ultimate Heat Sink bulk average temperature to within limits.	Immediately
	AND		
	C.3	Restore Ultimate Heat Sink bulk average temperature to within limits.	14 days
D. Required Action and associated Completion Time of Condition A, B or C not met.	D.1	Be in MODE 2.	6 hours
	AND		
	D.2	Be in MODE 3.	36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Ultimate Heat Sink bulk average boron concentration not within limits.	E.1	Initiate action to restore Ultimate Heat Sink bulk average boron concentration to within limits.	Immediately
	AND		
	E.2	Terminate flow into containment vessel from Ultimate Heat Sink via the Containment Flood and Drain System.	Immediately
	AND		
	E.3	Suspend containment vessel disassembly activities at containment tool.	Immediately
	AND		
	E.4	Suspend module movements.	Immediately
	AND		
	E.5	Suspend movement of irradiated fuel assemblies in the refueling area.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the Ultimate Heat Sink level is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.2	Verify the Ultimate Heat Sink bulk average temperature is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	Verify Ultimate Heat Sink bulk average boron concentration is within limits.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS hot temperature ≥ 200 °F.

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 2. AND B.2 Be in MODE 3 with RCS hot temperature < 200 °F.	6 hours 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Isolation Valves

LCO 3.6.2 Each containment isolation valve shall be OPERABLE.

APPLICABILTY: MODES 1 and 2,
MODE 3 with RCS hot temperature ≥ 200 °F.

ACTIONS

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

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.
4. Enter applicable Conditions and Required Actions of LCO 3.6.1, “Containment,” when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Only applicable to penetration flow paths with two containment isolation valves. ---------- One or more penetration flow paths with one containment isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. <u>AND</u>	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	Once per 31 days
B. ----------NOTE---------- Only applicable to penetration flow paths with two containment isolation valves. ---------- One or more penetration flow paths with two containment isolation valves inoperable.	B.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
C. Required Action and associated Completion Time not met.	C.1 AND C.2	Be in MODE 2. Be in MODE 3 with RCS hot temperature < 200 °F.	6 hours 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1	Verify [required] valves accumulator pressures are within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.2	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.3	Verify the isolation ACTUATION RESPONSE TIME of each automatic containment isolation valve is within limits. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.2.4	Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.1 Main Steam Isolation Valves (MSIVs)

LCO 3.7.1 Two MSIVs and two MSIV bypass valves per steam line shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

----------NOTE----------
Main steam line flow paths may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Separate Condition entry is allowed for each valve. ---------- One or more valves inoperable.	A.1 Isolate affected flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. <u>AND</u> A.2 ----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify affected flow path is isolated.	72 hours Once per 7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Steam line that cannot be isolated.	B.1 Isolate the affected main steam line.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2. AND C.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify [required] valves accumulator pressures are within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.7.1.2	Verify isolation ACTUATION RESPONSE TIME of each MSIV and MSIV bypass valve is within limits on an actual or simulated actuation signal. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.1.3	Verify each MSIV and MSIV bypass valve leakage is within limits.	In accordance with the INSERVICE TESTING PROGRAM

3.7 PLANT SYSTEMS

3.7.2 Feedwater Isolation

LCO 3.7.2 One Feedwater Isolation Valve (FWIV) and one Feedwater Regulation Valve (FWRV) for each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

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

1. Separate Condition entry is allowed for each valve.

2. Feedwater flow paths may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two FWIVs inoperable.	A.1 Isolate the affected FWIV flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND A.2 ----------NOTES---------- 1. Isolation in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify FWIV path isolated.	72 hours Once per 7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or two FWRVs inoperable.	B.1 Isolate the affected FWRV flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND B.2 ----------NOTES---------- 1. Isolation in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify FWRV path isolated.	72 hours Once per 7 days
C. Two valves in the same flow path inoperable.	C.1 Isolate the affected flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	8 hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 2. AND D.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify [required] FWIV accumulator pressures are within limits.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.2.2	Verify the closure ACTUATION RESPONSE TIME of each FWIV and FWRV is within limits on an actual or simulated actuation signal. The ACTUATION RESPONSE TIME is combined with the allocated MPS digital time response and the CHANNEL RESPONSE TIME to determine and verify the TOTAL RESPONSE TIME.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.2.3	Verify each FWIV and FWRV leakage is within limits.	In accordance with the INSERVICE TESTING PROGRAM

3.7 PLANT SYSTEMS

3.7.3 In-Containment Secondary Piping Leakage

LCO 3.7.3 Leakage through in-containment secondary system pipe walls shall be ≤ 1.5 gallons per hour (gph).

APPLICABILITY: MODES 1 and 2,
MODE 3 and not PASSIVELY COOLED.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. In-containment secondary system leakage > 1.5 gph.	A.1 Be in MODE 2. AND A.2 Be in MODE 3 and PASSIVELY COOLED.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	----------NOTE---------- Not required to be performed until 24 hours after establishment of steady state operation. ---------- Verify in-containment secondary system leakage ≤ 1.5 gph.	In accordance with the Surveillance Frequency Control Program

3.8 REFUELING OPERATIONS

3.8.1 Nuclear Instrumentation

LCO 3.8.1 Two refueling neutron flux channels and one refueling neutron flux audible count rate channel shall be OPERABLE.

APPLICABILITY: MODE 5, except when reactor vessel upper assembly is seated on reactor vessel flange.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required refueling neutron flux channel inoperable. OR Required refueling neutron flux audible count rate channel inoperable.	A.1 Suspend positive reactivity changes. AND A.2 Suspend operations that would cause introduction of water into UHS with boron concentration less than specified in the COLR.	Immediately Immediately
B. Two required refueling neutron flux channels inoperable.	B.1 Initiate actions to restore one refueling neutron flux channel to OPERABLE status. AND B.2 Perform SR 3.5.3.3.	Immediately Once per 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Perform a CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

3.8 REFUELING OPERATIONS

3.8.2 Decay Time

LCO 3.8.2 Reactor shall be subcritical for ≥ 48 hours.

APPLICABILITY: During movement of irradiated fuel in the reactor pressure vessel.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor subcritical for < 48 hours.	A.1 Suspend movement of irradiated fuel in the reactor pressure vessel.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	Verify reactor has been subcritical for ≥ 48 hours.	Once prior to movement of irradiated fuel assemblies in the reactor pressure vessel

4.0 DESIGN FEATURES

4.1 Site Location

[Site specific information to be provided by the combined license applicant.]

4.1.1 Site and Exclusion Boundaries

[Site specific information to be provided by the combined license applicant.]

4.1.2 Low Population Zone (LPZ)

[Site specific information to be provided by the combined license applicant.]

4.2 Reactor Core

4.2.1 Fuel Assemblies

The reactor shall contain 37 fuel assemblies. Each assembly shall consist of a matrix of fuel rods clad with a zirconium based alloy and containing an initial composition of natural or slightly enriched uranium dioxide (UO_2) as fuel material. Limited substitutions of zirconium based alloy or stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in non-limiting core regions.

4.2.2 Control Rod Assemblies

The reactor core shall contain 16 control rod assemblies. The control material shall be silver indium cadmium or boron carbide as approved by the NRC.

4.3 Fuel Storage

4.3.1 Criticality

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

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

4.0 DESIGN FEATURES

4.3 Fuel Storage (continued)

b. $k_{eff} \leq 0.95$ if fully flooded with borated water at a minimum soluble boron concentration of 800 ppm, which includes an allowance for uncertainties to assure a 95 percent probability and 95 percent confidence level;

c. $k_{eff} < 1.00$ if fully flooded with unborated water, which includes an allowance for uncertainties to assure a 95 percent probability and 95 percent confidence level;

d. A nominal 11.22 inch center-to-center distance between fuel assemblies placed in the spent fuel storage racks.

4.3.2 Drainage

The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below 20 ft above the spent fuel pool floor.

4.3.3 Capacity

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 1404 fuel assemblies.

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

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

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

5.1.2 The [Shift Manager (SM)] shall be responsible for the control room command function. During any absence of the SM from the control room while any unit is in MODE 1, 2, 3, 4, or 5, an individual with an active Senior Reactor Operator (SRO) 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 facility operation and corporate management, respectively. The onsite and offsite organizations shall include the positions for activities affecting safety of the nuclear power plant.

Lines of authority, responsibility, and communication shall be defined and established throughout highest management levels, intermediate levels, and all operating organization positions. These relationships shall be documented and updated, as appropriate, in organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation. These requirements including the plant-specific titles of those personnel fulfilling the responsibilities of the positions delineated in these Technical Specifications shall be documented in the [FSAR/QA Plan];

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

A [specified corporate officer] 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

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

5.2.2 Facility Staff

The facility staff organization shall include the following:

a. The minimum licensed operator staffing shall be:

Number of units Operating[1]	Reactor Operator	Senior Reactor Operator
None	2	1
One to twelve	3	3

[1] For the purpose of this table, a unit is considered to be operating when it is in MODE 1, 2, or 3.

5.2 Organization

5.2.2 Facility Staff (continued)

b. A person holding a senior reactor operator license for all fueled units at the site who is assigned responsibility for overall plant operation shall be onsite at all times when there is fuel in any unit.

c. A senior reactor operator license shall be in the control room at all times. In addition to this senior reactor operator, a licensed reactor operator or senior reactor operator shall be present at the controls at all times.

d. Shift crew composition may be less than the minimum requirement 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.

e. A radiation protection technician shall be on site when fuel is in any unit. The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.

f. The operations manager or assistant operations manager shall hold an SRO license.

g. An individual shall provide advisory technical support to the facility operations shift crew in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the facility. This individual shall meet the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift.

5.0 ADMINISTRATIVE CONTROLS

5.3 Facility Staff Qualifications

5.3.1 Each member of the facility staff shall meet or exceed the minimum qualifications of Regulatory Guide 1.8, Revision 3, 2000, or more recent revisions, or ANSI Standards acceptable to the NRC staff. The staff not covered by Regulatory Guide 1.8 shall meet or exceed the minimum qualifications of Regulations, Regulatory Guides, or ANSI Standards acceptable to NRC staff.

5.3.2 For the purpose of 10 CFR 55.4, a licensed Senior Reactor Operator (SRO) and a licensed Reactor Operator (RO) are those individuals who meet the requirements of TS 5.3.1 and TS 5.2.2.

5.0 ADMINISTRATIVE CONTROLS

5.4 Procedures

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

a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 3, June 2013;

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and NUREG-0737, Supplement 1;

c. Quality assurance for effluent and environmental monitoring;

d. Fire Protection Program implementation; and

e. All programs specified in Specification 5.5.

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

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

5.5.1 Offsite Dose Calculation Manual (ODCM)

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

b. The ODCM shall also contain the radioactive effluent controls and radiological environmental monitoring activities, and descriptions of the information that should be included in the Annual Radiological Environmental Operating, and Radioactive Effluent Release Reports required by Specification 5.6.1 and Specification 5.6.2.

c. Licensee initiated changes to the ODCM:

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

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

ii. A determination that the change(s) maintain the levels of radioactive effluent control required by 10 CFR 20.1302, 40 CFR 190, 10 CFR 50.36a, and 10 CFR 50, Appendix I, and not adversely impact the accuracy or reliability of effluent or dose calculations;

2. Shall become effective after the approval of the [plant manager]; and

3. Shall be submitted to the NRC in the form of a complete, legible copy of the changed portion of the ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. 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 (i.e., month and year) the change was implemented.

5.5 Programs and Manuals

5.5.2 Radioactive Effluent Control Program

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

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

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

3. Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.1302 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 for radioactive materials in liquid effluents released from each unit to unrestricted areas, conforming to 10 CFR 50, Appendix I;

5. Determination of cumulative 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. Determination of projected dose contributions from radioactive effluents in accordance with the methodology in the ODCM at least every 31 days;

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

5.5 Programs and Manuals

5.5.2 Radioactive Effluent Control Program (continued)

7. Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas beyond the site boundary shall be in accordance with the following:

   i. For noble gases: a dose rate ≤ 500 mrem/yr to the whole body and a dose rate ≤ 3000 mrem/yr to the skin and

   ii. For iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days: a dose rate ≤ 1500 mrem/yr to any organ;

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 10 CFR 50, Appendix I;

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 > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and

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

b. The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Radioactive Effluent Controls Program surveillance frequency.

5.5.3 Component Cyclic or Transient Limit

This program provides controls to track the FSAR Section 3.9 cyclic and transient occurrences to ensure that components are maintained within the design limits.

5.5.4 Steam Generator (SG) Program

A Steam Generator Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the Steam Generator Program shall include the following:

5.5 Programs and Manuals

5.5.4 Steam Generator (SG) Program (continued)

a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the “as found” condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.

b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational LEAKAGE.

1. Structural integrity performance criterion: All inservice steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, and cool down and all anticipated transients included in the design specification) and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.

2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube failure, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 150 gallons per day.

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.5, "RCS Operational LEAKAGE.”

5.5 Programs and Manuals

5.5.4 Steam Generator (SG) Program (continued)

c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding [40%] of the nominal tube wall thickness shall be plugged.

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following initial startup and SG replacement.

2. After the first refueling outage following SG installation, inspect each SG at least every 72 effective full power months or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube plugging criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up

5.5 Programs and Manuals

5.5.4 Steam Generator (SG) Program (continued)

to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.

a) After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;

b) During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;

c) During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and

d) During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.

3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected unit SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever results in more frequent inspections). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary to secondary LEAKAGE.

5.5.5 Secondary Water Chemistry Program

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation and low pressure turbine disc stress corrosion cracking. The program shall include:

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

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

5.5 Programs and Manuals

5.5.5 Secondary Water Chemistry Program (continued)

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

d. Procedures for the recording and management of data;

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

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

5.5.6 Explosive Gas and Storage Tank Radioactivity Monitoring Program

This program provides controls for potentially explosive gas mixtures contained in the Gaseous Rad-Waste Management System, the quantity of radioactivity contained in gas storage tanks or fed into the offgas treatment system, and the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. The gaseous radioactivity quantities shall be determined following the methodology in Branch Technical Position (BTP) 11-5, "Postulated Radioactive Release due to Waste Gas System Leak or Failure." The liquid radwaste quantities shall be determined in accordance with Standard Review Plan, Section 15.7.3, "Postulated Radioactive Release due to Liquid-Containing Tank Failures."

The program shall include:

a. The limits for concentrations of hydrogen and oxygen in the Gaseous Rad-Waste Management 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),

b. A surveillance program to ensure that the quantity of radioactivity contained in each gas storage tank and fed into the offgas treatment system is less than the amount that would result in a whole body exposure of ≥ 0.5 rem to any individual in an unrestricted area, in the event of an uncontrolled release of the tanks' contents, and

c. A surveillance program to ensure that the quantity of radioactivity contained in all outdoor liquid radwaste tanks that are not surrounded by liners, dikes, or walls, capable of holding the tanks' contents and that do not have tank overflows and surrounding area drains connected to the

5.5 Programs and Manuals

5.5.6 Explosive Gas and Storage Tank Radioactivity Monitoring Program (continued)

Liquid Radioactive Waste System is less than the amount that would result in concentrations less than the limits of 10 CFR 20, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area, in the event of an uncontrolled release of the tanks' contents.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Explosive Gas and Storage Tank Radioactivity Monitoring Program surveillance frequencies.

5.5.7 Technical Specifications (TS) Bases Control Program

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

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

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

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

2. A change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.

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

d. Proposed changes that meet the criteria of 5.5.7(b) above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

5.5.8 Safety Function Determination Program (SFDP)

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

5.5 Programs and Manuals

5.5.8 Safety Function Determination Program (SFDP) (continued)

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

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

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

4. Other appropriate limitations and remedial or compensatory actions.

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

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

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

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

c. The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered. When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

5.5.9 Containment Leakage Rate Testing Program

a. A program shall implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.

b. The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.20% of containment air weight per day.

5.5 Programs and Manuals

5.5.9 Containment Leakage Rate Testing Program (continued)

c. Containment leakage rate acceptance criterion is < 0.60 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and Type C tests.

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

e. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.10 Setpoint Program (SP)

a. The Setpoint Program (SP) implements the regulatory requirement of 10 CFR 50.36(c)(1)(ii)(A) that technical specifications will include items in the category of limiting safety system settings (LSSS), which are settings for automatic protective devices related to those variables having significant safety functions.

b. The Limiting Trip Setpoint (LTSP), Nominal Trip Setpoint (NTSP), As-Found Tolerance (AFT), and As-Left Tolerance (ALT) for each Technical Specification required automatic protection instrumentation function shall be calculated in conformance with [TR-0616-49121-P, Revision 1, "NuScale Instrument Setpoint Methodology."]

c. For each Technical Specification required automatic protection instrumentation function, performance of a CHANNEL CALIBRATION surveillance “in accordance with the Setpoint Program (SP)” shall include the following:

1. The as-found value of the instrument channel trip setting shall be compared with the previously recorded as-left value.

i. If all as-found measured trip setpoint values during calibration and surveillance testing are inside the two-sided limits of Nominal Trip Setpoint (NTSP) plus or minus the Performance and Test Acceptance Criteria Band (PTAC), then the channel is fully OPERABLE, no additional actions are required.

5.5 Programs and Manuals

5.5.10 Setpoint Program (SP) (continued)

ii. If during channel OPERABILITY or calibration testing, the measured trip setpoint values are within the As-Found Tolerance band but outside the As-Left Tolerance Band, then the instrumentation channel is fully OPERABLE, however, calibration is required to restore the channel within the as-left tolerance band.

iii. If any as-found calibration setting value is outside the as-found Tolerance band, then the channel is inoperable, and corrective action is required. Calibration is required to restore the channel to within as-left tolerance band.

2. The instrument channel trip setting shall be set to a value within the specified ALT around the specified NTSP at the completion of the surveillance; otherwise, the surveillance requirement is not met and the instrument channel shall be immediately declared inoperable.

d. The difference between the instrument channel trip setting as-found value and the previously recorded as-left value for each Technical Specification required automatic protection instrumentation function shall be trended and evaluated to verify that the instrument channel is functioning in accordance with its design basis.

e. The SP shall establish a document containing the current value of the specified LTSP, NTSP, AFT, and ALT for each Technical Specification required automatic protection instrumentation function and references to the calculation documentation. Changes to this document shall be governed by the regulatory requirement of 10 CFR 50.59. In addition, changes to the specified LTSP, NTSP, AFT, and ALT values shall be governed by the approved setpoint methodology. This document, including any revisions or supplements, shall be provided upon issuance to the NRC.

5.5.11 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

5.5 Programs and Manuals

5.5.11 Surveillance Frequency Control Program (continued)

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1. FSAR Table 16.1-1, Surveillance Frequency Control Program Base Frequencies, describes the plant licensing bases for the surveillance test intervals.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

5.5.12 Spent Fuel Storage Rack Neutron Absorber Monitoring Program

This Program provides controls for monitoring the condition of the neutron absorber used in the spent fuel pool storage racks to verify the Boron-10 areal density is consistent with the assumptions in the spent fuel pool criticality analysis. The program shall be in accordance with NEI 16-03-A, "Guidance for Monitoring of Fixed Neutron Absorbers in Spent Fuel Pools," Revision 0, May 2017.

5.0 ADMINISTRATIVE CONTROLS

5.6 Reporting Requirements

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

5.6.1 Annual Radiological Environmental Operating Report

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

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

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. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

5.6.2 Radioactive Effluent Release Report

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

The Radioactive Effluent Release Report covering the operation of the facility in the previous year shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the facility.

The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR 50, Appendix I, Section IV.B.1.

5.6 Reporting Requirements

5.6.3 Core Operating Limits Report (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

3.1.1, “SHUTDOWN MARGIN (SDM)”;

3.1.3, “Moderator Temperature Coefficient (MTC)”;

3.1.4, “Rod Group Alignment Limits”;

3.1.5, “Shutdown Bank Insertion Limits”;

3.1.6, “Regulating Bank Insertion Limits”;

3.1.8, “PHYSICS TESTS Exceptions”;

3.1.9, “Boron Dilution Control”;

3.2.1, “Enthalpy Rise Hot Channel Factor ($F_{\Delta H}$)”;

3.2.2, “AXIAL OFFSET (AO)”;

3.4.1, “RCS Pressure, Temperature, and Flow Resistance Critical Heat Flux (CHF) Limits”;

3.5.3, “Ultimate Heat Sink”; and

3.8.1, "Nuclear Instrumentation".

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:

[----------REVIEWER'S NOTE----------
The COL applicant shall confirm the validity of each listed document and the listed Specifications for the associated core operating limits, or state the valid NRC approved analytical method document and list of associated Specifications.

The COL applicant shall state the valid core reload analysis methodology document and list of associated Specifications.
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5.6 Reporting Requirements

5.6.3 Core Operating Limits Report (COLR) (continued)

1. [NuScale Standard Design Certification Analysis (DCA), Part 2, Tier 2, NuScale Final Safety Analysis Report (FSAR), Section 4.3, “Nuclear Design,” Revision 1, March 2018; TR-0516-49416, “Non-Loss-of-Coolant Accident Analysis Methodology,” Revision 0, May 2016 (NuScale Proprietary); TR-0516-49422, "Loss-of-Coolant Accident Methodology," Revision 0, May 2016 (NuScale Proprietary); and TR-0716-50250, "Rod Ejection Accident Methodology," Revision 0, July 2016 (NuScale Proprietary).

   (Methodology for Specifications 3.1.1 – SHUTDOWN MARGIN (SDM), 3.1.3 – Moderator Temperature Coefficient, 3.1.4 – Rod Group Alignment Limits, 3.1.5 – Shutdown Bank Insertion Limits, 3.1.6 - Regulating Bank Insertion Limits, and 3.1.8 - PHYSICS TESTS Exceptions.)]

2. [NuScale DCA, Part 2, Tier 2, NuScale FSAR, Section 9.3.4, “Chemical and Volume Control System,“ Revision 1, March 2018; and TR-0516-49416, “Non-Loss-of-Coolant Accident Analysis Methodology,” Revision 0, May 2016 (NuScale Proprietary).

   (Methodology for Specification 3.1.9 – Boron Dilution Control.)]

3. [NuScale DCA, Part 2, Tier 2, NuScale FSAR, Sections 4.3, “Nuclear Design,” and 4.4, “Thermal and Hydraulic Design,“ Revision 1, March 2018; TR-0516-49416, “Non-Loss-of-Coolant Accident Analysis Methodology,” Revision 0, May 2016 (NuScale Proprietary); TR-0915-17564-A, “Subchannel Analysis Methodology,” Revision 2, February 2019 (NuScale Proprietary); TR-0516-49422, "Loss-of-Coolant Accident Methodology," Revision 0, May 2016 (NuScale Proprietary); and TR-0716-50250, "Rod Ejection Accident Methodology," Revision 0, July 2016 (NuScale Proprietary).

   (Methodology for Specifications 3.2.1 – Enthalpy Rise Hot Channel Factor ($F_{\Delta H}$), and 3.2.2 – AXIAL OFFSET (AO).)]

4. [NuScale DCA, Part 2, Tier 2, NuScale FSAR, Section 4.4, “Thermal and Hydraulic Design,“ Revision 1, March 2018; TR-0516-49416, “Non-Loss-of-Coolant Accident Analysis Methodology,” Revision 0, May 2016 (NuScale Proprietary); TR-0516-49422, "Loss-of-Coolant Accident Methodology," Revision 0, May 2016 (NuScale Proprietary); and TR-0716-50250, "Rod Ejection Accident Methodology," Revision 0, July 2016 (NuScale Proprietary).

5.6 Reporting Requirements

5.6.3 Core Operating Limits Report (COLR) (continued)

(Methodology for Specification 3.4.1 – RCS Pressure, Temperature, and Flow Resistance CHF Limits.)]

5. [NuScale DCA, Part 2, Tier 2, NuScale FSAR, Section 4.3, "Nuclear Design," Revision 1, March 2018.

(Methodology for Specifications 3.5.3 – Ultimate Heat Sink, and 3.8.1 – Nuclear Instrumentation.)]

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Passive Core Cooling Systems limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any mid-cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.4 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

a. RCS pressure and temperature limits for heat up, cooldown, low temperature operation, criticality, and hydrostatic testing as well as heatup and cooldown rates shall be established and documented in the PTLR for the following:

3.3.1, "Module Protection System (MPS) Instrumentation";

3.3.3, "Engineered Safety Features Actuation System (ESFAS) Logic and Actuation";

3.3.4, "Manual Actuation Functions";

3.4.3, "RCS Pressure and Temperature (P/T) Limits"; and

3.4.4, "Reactor Safety Valves (RSVs)".

5.6 Reporting Requirements

5.6.4 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in the following document:

TR-1015-18177, "Pressure and Temperature Limits Methodology," [Revision 0, December 2016.]

c. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluency period and for any revision or supplement thereto.

5.6.5 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 3 following completion of an inspection performed in accordance with the Specification 5.5.4, "Steam Generator (SG) Program." The report shall include:

a. The scope of inspections performed on each SG.

b. Degradation mechanisms found.

c. Nondestructive examination techniques utilized for each degradation mechanism.

d. Location orientation (if linear), and measured sizes (if available) of service induced indications.

e. Number of tubes plugged during the inspection outage for each degradation mechanism.

f. The number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator.

g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

5.0 ADMINISTRATIVE CONTROLS

5.7 High Radiation Area

As provided in paragraph 20.1601(c) of 10 CFR Part 20, the following controls shall be applied to high radiation areas in place of the controls required by paragraph 20.1601(a) and (b) of 10 CFR Part 20:

5.7.1 High Radiation Areas with Dose Rates Not Exceeding 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation

a. Each entryway to such an area shall be barricaded and conspicuously posted as a high radiation area. Such barricades may be opened as necessary to permit entry or exit of personnel or equipment.

b. Access to, and activities in, each such area shall be controlled by means of Radiation Work Permit (RWP) or equivalent that includes specification of radiation dose rates in the immediate work area(s) and other appropriate radiation protection equipment and measures.

c. Individuals qualified in radiation protection procedures and personnel continuously escorted by such individuals may be exempted from the requirement for an RWP or equivalent while performing their assigned duties provided that they are otherwise following plant radiation protection procedures for entry to, exit from, and work in such areas.

d. Each individual or group entering such an area shall possess:

1. A radiation monitoring device that continuously displays radiation dose rates in the area; or

2. A radiation monitoring device that continuously integrates the radiation dose rates in the area and alarms when the device's dose alarm setpoint is reached, with an appropriate alarm setpoint; or

3. A radiation monitoring device that continuously transmits dose rate and cumulative dose information to a remote receiver monitored by radiation protection personnel responsible for controlling personnel radiation exposure within the area; or

4. A self-reading dosimeter (e.g., pocket ionization chamber or electronic dosimeter); and

5.7 High Radiation Area

5.7.1 High Radiation Areas with Dose Rates Not Exceeding 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation (continued)

(i) Be under the surveillance, as specified in the RWP or equivalent, while in the area, of an individual qualified in radiation protection procedures, equipped with a radiation monitoring device that continuously displays radiation dose rates in the area; who is responsible for controlling personnel exposure within the area; or

(ii) Be under the surveillance as specified in the RWP or equivalent, while in the area, by means of closed circuit television, of personnel qualified in radiation protection procedures, responsible for controlling personnel radiation exposure in the area, and with the means to communicate with individuals in the area who are covered by such surveillance.

e. Except for individuals qualified in radiation protection procedures, or personnel continuously escorted by such individuals, entry into such areas shall be made only after dose rates in the area have been determined and entry personnel are knowledgeable of them. These continuously escorted personnel will receive a pre-job briefing prior to entry into such areas. This dose rate determination, knowledge, and pre-job briefing does not require documentation prior to initial entry.

5.7.2 High Radiation Areas with Dose Rates Greater than 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation, but less than 500 rads/hour at 1 Meter from the Radiation Source or from any Surface Penetrated by the Radiation

a. Each entryway to such an area shall be conspicuously posted as a high radiation area and shall be provided with a locked or continuously guarded door or gate that prevents unauthorized entry, and, in addition:

1. All such door and gate keys shall be maintained under the administrative control of the [shift manager], radiation protection manager, or his or her designees; and

2. Doors and gates shall remain locked except during periods of personnel or equipment entry or exit.

5.7 High Radiation Area

5.7.2 High Radiation Areas with Dose Rates Greater than 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation, but less than 500 rads/hour at 1 Meter from the Radiation Source or from any Surface Penetrated by the Radiation (continued)

b. Access to, and activities in, each such area shall be controlled by means of an RWP or equivalent that includes specification of radiation dose rates in the immediate work area(s) and other appropriate radiation protection equipment and measures.

c. Individuals qualified in radiation protection procedures may be exempted from the requirement for an RWP or equivalent while performing radiation surveys in such areas provided that they are otherwise following plant radiation protection procedures for entry to, exit from, and work in such areas.

d. Each individual group entering such an area shall possess:

1. A radiation monitoring device that continuously integrates the radiation rates in the area and alarms when the device's dose alarm setpoint is reached, with an appropriate alarm setpoint; or

2. A radiation monitoring device that continuously transmits dose rate and cumulative dose information to a remote receiver monitored by radiation protection personnel responsible for controlling personnel radiation exposure within the area with the means to communicate with and control every individual in the area; or

3. A self-reading dosimeter (e.g., pocket ionization chamber or electronic dosimeter); and

(i) Be under surveillance, as specified in the RWP or equivalent, while in the area, of an individual qualified in radiation protection procedures, equipped with a radiation monitoring device that continuously displays radiation dose rates in the area; who is responsible for controlling personnel exposure within the area, or

(ii) Be under surveillance as specified in the RWP or equivalent, while in the area, by means of closed circuit television, or personnel qualified in radiation protection procedures, responsible for controlling personnel radiation exposure in the area, and with the means to communicate with and control every individual in the area.

5.7 High Radiation Area

5.7.2 High Radiation Areas with Dose Rates Greater than 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation, but less than 500 rads/hour at 1 Meter from the Radiation Source or from any Surface Penetrated by the Radiation (continued)

4. In those cases where options (2) and (3), above, are impractical or determined to be inconsistent with the “As Low As is Reasonably Achievable” principle, a radiation monitoring device that continuously displaces radiation dose rates in the area.

e. Except for individuals qualified in radiation protection procedures, or personnel continuously escorted by such individuals, entry into such areas shall be made only after dose rates in the area have been determined and entry personnel are knowledgeable of them. These continuously escorted personnel will receive a pre-job briefing prior to entry into such areas. This dose rate determination, knowledge, and pre-job briefing do not require documentation prior to initial entry.

f. Such individual areas that are within a larger area where no enclosure exists for the purpose of locking and where no enclosure can reasonably be constructed around the individual area need not be controlled by a locked door or gate, nor continuously guarded, but shall be barricaded, conspicuously posted, and a clearly visible flashing light shall be activated at the area as a warning device.