ENCLOSURE 7

Replacement Pages for ITS, ITS Bases, and ITS Justification Packages

ITS SECTION 3.1

"REACTIVITY CONTROL"

REPLACEMENT PAGES

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 4.1.3.6 requires determination of regulatory group position at different intervals based on PDIL alarm circuit OPERABILITY. However, CTS does not include OPERABILITY or SRs for the PDIL alarm circuit. ITS 3.1.7 includes the an LCO requirement that the PDIL alarm circuit be Operable. Action D has been added for an inoperable PDIL alarm circuit and SR 3.1.7.3 has been added to verify PDIL alarm circuit OPERABILITY. The addition of new requirements constitutes a more restrictive change. This change is consistent with NUREG-1432.

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS 3.1.3.6 LCO Note ** provides a detailed description of the CEA response due to a reactor power cutback. ITS 3.1.3.6 does not include this discussion. This discussion is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the COLR. Any changes to the requirements in the COLR will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the COLR is acceptable and is consistent with NUREG-1432.

ITS SECTION 3.3

"INSTRUMENTATION"

REPLACEMENT PAGES

DETAIL RELOCATED PER SPLIT REPORT

None

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS Table 3.3-3, Action 13 states in part; "The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN". ITS Condition A states that the channel will be restored to Operable status prior to entering MODE 2 following the next MODE 5 entry. The CTS Action states that the channel must be returned to OPERABLE status during the next Cold Shutdown. The ITS will allow the plant to transition from Mode 5 to Mode 2 with an inoperable channel. The INOPERABLE channel will continue to be bypassed per ITS Action A. When a channel is bypassed per ITS Action A the channel meets its redundancy requirements and there is no affect on plant safety. This change is consistent with NUREG-1432.

L.2 The ITS provides a new Action for inoperable channel operational bypass removal functions for channels that are equipped with operational bypasses whereas the CTS requires the channel to be made inoperable and placed in trip channel bypass if the operational bypass removal function is inoperable. The CTS does not provide an action for an inoperable operational bypass removal. The ITS will allow an inoperable operational bypass function to be disabled, with the channel remaining OPERABLE. If the operational bypass function is not disabled the channel is placed in trip channel bypass or tripped. Only the automatic bypass removal function affects the Operability of the channel. The ability to manually bypass a function is needed to prevent unnecessary trips when plant conditions are such that the protective function is not needed. If the channel cannot be manually placed in operational bypass it does not affect the ability of the channel to provide the trip function when needed therefore it does not affect the OPERABILITY of the channel, and operation with a disabled operational bypass has no impact on plant safety. This change allows a channel with a disabled bypass channel to remain Operable. This change will maximize the channel availability by eliminating the need to make the channel inoperable due to the failure of a operating bypass function. This change is consistent with NUREG-1432.

SPECIFICATION 3.3.6

3.3.6-1 (A.1)

TABLE ~~4.3-2~~ (Continued)

TABLE NOTATION

SR 3.3.6.2 ~~(1)~~ Each train or logic channel shall be tested at least every ~~62 days~~ 9 months (L.8) on a STAGGERED TEST BASIS.

SR 3.3.6.1 NOTE ~~(2)~~ Testing of automatic actuation logic shall include energization/deenergization of each initiation relay and verification of proper operation of each initiation relay.

(3) A subgroup relay test shall be performed which shall include the energization/deenergization of each subgroup relay and verification of the OPERABILITY of each subgroup relay. Relays ~~listed below are~~ exempt from testing during POWER OPERATION but shall be tested ~~at least once per 18 months during REFUELING and during~~ each ~~COLD SHUTDOWN condition unless tested within the previous 62 days~~. 18 months (L.6)

ACTUATION DEVICES THAT CANNOT BE TESTED AT POWER

LA.3

TRAIN A ESF FUNCTION	TRAIN A ACTUATION DEVICE	TRAIN B ESF FUNCTION	TRAIN B ACTUATION DEVICE
SIAS A	K108	SIAS B	K108
SIAS A	K409	SIAS B	K409
CIAS A	K202	CIAS B	K204
CIAS A	K204	CSAS B	K304
CSAS A	K304	MSIS B	K305
MSIS A	K305	MSIS B	K404
MSIS A	K404	AFAS 1B	K113
AFAS 1A	K211	AFAS 1B	K211
AFAS 2A	K112	AFAS 2B	K112

In the case of the following relays which are tested during power operation, one or more pieces of equipment cannot be actuated, but can be racked out, bypassed or etc., which will not preclude the relay from being tested but will not actuate the locked out equipment associated with the relay:

TRAIN A ESF FUNCTION	TRAIN A ACTUATION DEVICE	TRAIN B ESF FUNCTION	TRAIN B ACTUATION DEVICE
SIAS A	K401	SIAS B	K301
SIAS A	K410	SIAS B	K308
SIAS A	K412	CIAS B	K203
CIAS A	K203	CIAS B	K210
CIAS A	K210	RAS B	K104
RAS A	K104	RAS B	K312
RAS A	K312	RAS B	K405
RAS A	K405		
AFAS 1A	K113		

Rev. E

ITS SECTION 3.5

"ECCS"

REPLACEMENT PAGES

BACKGROUND (continued)

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) Systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident.

Additionally, the SIT motor operated isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a Safety Injection Actuation Signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action.

The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow one less than the required SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that one less than the required SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

Due to the reduced decay heat removal requirements in MODES 3 and 4, and the reduced probability of a Design Basis Accident (DBA), the SITS operational requirements are reduced. The operational requirement allows either three or four SITs to be OPERABLE with a reduced borated water volume.

(continued)

ITS SECTION 3.7

"PLANT SYSTEMS"

REPLACEMENT PAGES

BASES

APPLICABLE SAFETY ANALYSIS (continued)

The EW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

The EW System also functions to cool the unit from SDC entry conditions (T_{cold} < 350°F) to MODE 5 (T_{cold} < 210°F) during normal and post accident operations. The time required to cool from 350°F to 210°F is a function of the number of EW and SDC trains operating. One EW train is sufficient to remove decay heat during subsequent operations with T_{cold} < 210°F. This assumes that the worst case meteorological conditions occur simultaneously with the maximum heat loads on the system.

The EW System satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

The EW trains are independent of each other to the degree that each has separate controls and power supplies and the operation of one does not depend on the other. In the event of a DBA, one EW train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two EW trains must be OPERABLE. At least one EW train will operate assuming the worst single active failure occurs coincident with the loss of offsite power.

A EW train is considered OPERABLE when the following:

a. The associated pump and surge tank are OPERABLE; and

b. The associated piping, valves, heat exchanger and instrumentation and controls required to perform the safety related function are OPERABLE.

The isolation of EW from other components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the EW System.

(continued)

BASES

2
The EW System

APPLICABLE SAFETY ANALYSES (continued)

following a LOCA, and provides a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System (RCS) by the safety injection pumps. 2
the containment sump

EW 2
The CCW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

EW 210 2
The CCW System also functions to cool the unit from SDC entry conditions (T_{cold} < [350]°F) to MODE 5 (T_{cold} < [200]°F) during normal and post accident operations. The time required to cool from [350]°F to [200]°F is a function of the number of CCW and SDC trains operating. One CCW train is sufficient to remove decay heat during subsequent operations with T_{cold} < [200]°F. This assumes that a maximum seawater temperature of 76°F occurs simultaneously with the maximum heat loads on the system.

EW 2 210 210 EW 2 2
the worst case meteorological conditions

EW 2
The CCW System satisfies Criterion 3 of the NRC Policy Statement.
10CFR50.36(c)(2)(ii)

LCO

EW
The CCW trains are independent of each other to the degree that each has separate controls and power supplies and the operation of one does not depend on the other. In the event of a DBA, one CCW train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two CCW trains must be OPERABLE. At least one CCW train will operate assuming the worst single active failure occurs coincident with the loss of offsite power.

EW 2 EW EW 2

EW
A CCW train is considered OPERABLE when the following:

a. The associated pump and surge tank are OPERABLE; and

b. The associated piping, valves, heat exchanger and instrumentation and controls required to perform the safety related function are OPERABLE.

2 EW
The isolation of CCW from other components or systems ~~not required for safety~~ may render those components or systems inoperable, but does not affect the OPERABILITY of the CCW System. 2 EW 2

(continued)

Rev E

ITS SECTION 3.8

"ELECTRICAL POWER SYSTEMS"

REPLACEMENT PAGES

Because of the level of detail and varying conditions of each unit, this information is moved from CTS to the ITS 3.8.1.G Bases. Any changes to the Bases are controlled according to the TS Bases Control Program. This provides equivalent regulatory control and is an administrative change. This requirement is not required to be in ITS to provide adequate protection of public health and safety.

Degraded grid voltage issues are a plant specific concern at PVNGS that have been recently addressed with a TS amendment. (Refer to DOC LA.6 of ITS 3.8.1.)

19. ITS SR 3.8.1.5 (check for and remove accumulated water from each day tank) states that the SR will be performed every 92 days as opposed to the NUREG-1432 bracketed value of 31 days. Due to meteorological conditions of the area (low humidity, desert region), under worst case conditions very little moisture would accumulate in the fuel tanks by tank breathing and ambient moisture condensation over a 3-month period. Therefore, the frequency of this SR was modified to reflect specific PVNGS desert environment conditions. This is more restrictive than the current licensing basis for the Diesel Generator Fuel Oil Day Tank (refer to DOC M.2 of specification 3.8.1). The 92 day frequency for ITS SR 3.8.1.5, however, is consistent with the current licensing basis for the Diesel Generator Fuel Oil Storage Tanks as identified in UFSAR Section 1.8, Regulatory Guide 1.137, exception D and the Current Technical Specification SR 4.8.1.3.1.2.

20. ITS SR 3.8.1.7, .12, .15, and .20 verify each DG achieves, in ≤ 10 seconds, at least 3740 V and 58.8 Hz, and subsequently achieves steady state voltage ≥ 3740 V and ≤ 4580 V, and frequency ≥ 59.7 Hz and ≤ 61.2 Hz.

    The timed start (≤ 10 seconds) is satisfied when the DG achieves at least 3740 volts and 58.8 Hz. At these values, the DG output breaker permissives are satisfied; and on detection of bus undervoltage or loss of power and subsequent load shed of the bus, the DG breakers would close reenergizing its respective ESF bus. Following the timed start, it is expected that the rated speed (i.e., frequency) and voltage will stabilize and maintain steady state voltage at 4160 ± 420 volts and frequency at 60 +1.2/-0.3 Hz.

    A minimum voltage and frequency is specified rather than an upper and a lower limit because a diesel engine acceleration at full fuel (such as during a fast start) is likely to "overshoot" the upper limit initially

and then go through several oscillations prior to a voltage and frequency within the stated upper and lower bounds. The time to reach "steady state" could exceed 10 seconds, and be cause to fail the SR. However, on an actual emergency start, the EDG would reach minimum voltage and frequency in ≤ 10 seconds at which time it would be loaded. Application of the load will dampen the oscillations. Therefore, only specifying the minimum voltage and frequency (at which the EDG can accept load) demonstrates the necessary capability of the EDG to satisfy safety requirements without including a potential for failing the Surveillance.

These NUREG-1432 10-second start tests are modified to provide minimum volt/Hz range as steady state acceptance criteria. The intent of the 10 second start tests is to confirm the ability of the DG to reach the minimum conditions to accept load. This is consistent with the revised ITS minimum volt/Hz. A new range of acceptance voltage and frequency are provided which are applicable only to steady state operation.

21. ITS SR 3.8.1.8 through .14 and .16 through .19 do not contain the Note "However credit may be taken for unplanned events that satisfy this SR." A revision to Bases for SR 3.0.1 to clarify that credit may be taken for unplanned events to satisfy any SR, not just those in Section 3.8 eliminates the need for the Note. The revision to the Bases for SR 3.0.1 will provide the necessary clarification so that the usage of this allowance can be applied consistently throughout the ITS. This NUREG exception is consistent with TSTF-8, Rev. 2.

22. ITS SR 3.8.1.11 includes a Note 3 "Momentary voltage and frequency transients induced by load changes do not invalidate this test." This note is to provide clarification that the range of acceptable voltage and frequency are applicable only to steady state operation. This exception is provided as a TS SR clarification. Therefore, although this is a deviation from NUREG-1432, it is consistent with PVNGS licensing basis.

23. ITS SR 3.8.1.11, .12, and .20 have deleted the requirement to start from "standby condition," and may be started from the as-found condition provided the jacket water cooling and lube oil temperatures are within the lower to upper limits of DG OPERABILITY. This is acceptable because the three SRs are primarily intended to test system response, and not the ability of the DG to start from standby condition. Deleting this constraint will decrease unnecessary stress on the DG while providing increased flexibility for scheduling tests. Therefore, although this is a deviation from NUREG-1432, it is consistent with PVNGS licensing basis (current CTS).

24. ITS SR 3.8.1.14 has two additional notes (Note 3 and Note 4) providing for engine prelube period followed by a warmup period prior to loading and gradual loading as recommended by the manufacturer. This provision is currently specified in CTS 4.8.1.1.2.d.7 as a footnote. STS Bases for SR 3.8.1.14 states "The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR." This is an existing permissive in the STS Bases that if acceptable should be stated in the TS SR. Therefore, although this is a deviation from NUREG-1432, it is consistent with PVNGS licensing basis and an existing plant specific operating practice.

25. ITS SR 3.8.1.7 and CTS SR 4.8.1.1.2.C have a note which allows DG starts to be preceded by an engine prelube period and followed by a warmup period prior to loading as recommended by the manufacturer. The NUREG has a note which allows the prelube but does not address the warmup period. The warmup period assists in minimizing wear on moving parts. Therefore, although this is a deviation from NUREG 1432, it is consistent with the current licensing basis.

5. NUREG-1432 3.8.2 Applicability statement applies to Modes 5 and 6, and during movement of irradiated fuel assemblies. Therefore, if the LCO is not met during movement of irradiated fuel assemblies in Modes 1 through 4 (while operating), this shutdown specification must be entered. The additional text has been added to the ACTION section of the Bases to preclude an unnecessary plant shutdown, if immediate suspension of movement of irradiated fuel assemblies is not possible because of completion of the fuel movement to establish a safe conservative condition. The ACTIONS are modified by a Note that identifies required Actions A.2.3 and B.3 are not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS APPLICABILITY states, "MODES 5 and 6." ITS APPLICABILITY states, "MODES 5 and 6," and adds "During movement of irradiated fuel assemblies." This change places an additional restriction on plant operation during movement of irradiated fuel assemblies (Mode 1 through 6 and defueled). This change assures that systems needed to mitigate a fuel handling accident are available. The CTS would require features necessary to mitigate the events that can lead to core damage during shutdown, and instrument and control capability for monitoring and maintaining the unit in Modes 5 and 6. However, CTS did not explicitly cover the condition when moving irradiated fuel assemblies. The additional requirement is necessary to ensure adequate AC power is available when irradiated fuel assemblies are being moved. The addition of this requirement is a more restrictive change to plant operation and is consistent with NUREG-1432. This additional requirement results in the need for a clarifying Note to the Actions. The ACTIONS are modified by a Note that identifies required Actions A.2.3 and B.3 are not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

M.2 CTS 3.8.1.2 does not contain an Action as specified in ITS 3.8.2 Required Action A.1 to immediately declare affected required feature(s) inoperable with no offsite power available. An offsite circuit is inoperable if it is not available to one required ESF train. Although two trains are required by CTS 3.8.10, the remaining train with offsite power available may be capable of supporting required features to allow continuation of CORE ALTERATIONS and fuel movement. The option to declare required features inoperable, with no offsite power available, implements restrictions in accordance with the affected required features LCO. This requirement is a more restrictive change to plant operation and is consistent with NUREG-1432.

1. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

2. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values are directly transferred from the CTS to the ITS.

3. NUREG-1432 3.8.5 Applicability statement applies to Modes 5 and 6, and during movement of irradiated fuel assemblies. Therefore, if the LCO is not met during movement of irradiated fuel assemblies in Modes 1 through 4 (while operating), this shutdown specification must be entered. The additional text has been added to the ACTION section of the Bases to preclude an unnecessary plant shutdown, if immediate suspension of movement of irradiated fuel assemblies is not possible because of completion of the fuel movement to establish a safe conservative condition. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

4. ITS 3.8.5 contains two additional Actions (B and C) that address the Condition of no battery chargers on a DC bus. These Actions allow continued operation providing the associated battery cell parameters meet Category A requirements. This is acceptable because the battery is monitored on an increased Frequency which takes into account a battery's ability to maintain its short term capability to respond to a design basis event. If the battery cell parameters cannot be maintained within Category A limits, the short term capability of the battery is degraded. This will then require monitoring battery cell parameters per LCO 3.8.6. The wording of Conditions A and B was revised to make a clear distinction between the battery chargers and the rest of the DC power subsystem. Although this is a deviation from NUREG-1432, it is consistent with PVNGS licensing basis.

   A 24 hour limitation is also added to require the charger to be restored to an OPERABLE status. This is more restrictive than the PVNGS current licensing basis. Refer to DOC M.4.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS APPLICABILITY states, "MODES 5 and 6." ITS APPLICABILITY states, "MODES 5 and 6," and adds "During movement of irradiated fuel assemblies." This change places an additional restriction on plant operation during movement of irradiated fuel assemblies (Mode 1 through 6 and defueled). This change assures that systems needed to mitigate a fuel handling accident are available. The CTS would require features necessary to mitigate the events that can lead to core damage during shutdown, and instrument and control capability for monitoring and maintaining the unit in Modes 5 and 6. However, CTS did not explicitly cover the condition when moving irradiated fuel assemblies. The additional requirement is necessary to ensure adequate AC power is available when irradiated fuel assemblies are being moved. The addition of this requirement is a more restrictive change to plant operation and is consistent with NUREG-1432. The additional requirement results in the need for a clarifying Note to the Actions. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable to the movement of irradiated fuel assemblies in Modes 1 through 4. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

M.2 Intentionally Blank

M.3 Intentionally Blank

M.4 CTS 3.8.2.2, Action b allows the battery charger to be inoperable indefinitely provided the battery meets the Category A limits of CTS SR 4.8.2.1a.1. The ITS requires the charger to be restored within 24 hours even when the battery cells parameters have been verified to meet the Category A limits of ITS Table 3.8.6-1. The 24 hour completion time provides a period of time to correct the problem commensurate with the importance of maintaining the battery charger in an OPERABLE status. The addition of this requirement is a more restrictive change to PVNGS current operating practice.

1. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

2. (Intentionally blank)

3. ITS 3.8.8 adds information that states the required inverter(s) must be powered from its associated 125 VDC station battery. ITS 3.8.8 Bases is revised to ensure consistency with ITS 3.8.7 Bases, Inverters - Operating. This change is consistent with NUREG-1432.

4. (Intentionally blank)

5. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values are directly transferred from the CTS to the ITS.

6. NUREG-1432 3.8.8 Applicability statement applies to Modes 5 and 6, and during movement of irradiated fuel assemblies. Therefore, if the LCO is not met during movement of irradiated fuel assemblies in Modes 1 through 4 (while operating), this shutdown specification must be entered. The additional text has been added to the ACTION section of the Bases to preclude an unnecessary plant shutdown, if immediate suspension of movement of irradiated fuel assemblies is not possible because of completion of the fuel movement to establish a safe conservative condition. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

ADMINISTRATIVE CHANGES (continued)

(as described in ITS 3.8.9 Bases) shall be OPERABLE to support equipment required to be OPERABLE. These various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs (e.g., LCO 3.8.2, LCO 3.8.5, and LCO 3.8.8), depending on specific unit conditions.

2. ITS LCO 3.8.8 encompasses the inverter portion of CTS LCO 3.8.3.2.b. ITS 3.8.8 LCO refers to required inverter(s) shall be OPERABLE to support the onsite Class 1E AC vital instrument bus electrical power distribution subsystems required by LCO 3.8.10.

Therefore, the administrative change of splitting the action requirement between two ITS specifications to be consistent with NUREG-1432 does not change any PVNGS current operating practice.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS APPLICABILITY states, "MODES 5 and 6." ITS APPLICABILITY states, "MODES 5 and 6," and adds "During movement of irradiated fuel assemblies." This change places an additional restriction on plant operation during movement of irradiated fuel assemblies (Mode 1 through 6 and defueled). This change assures that systems needed to mitigate a fuel handling accident are available. The CTS would require features necessary to mitigate the events that can lead to core damage during shutdown, and instrument and control capability for monitoring and maintaining the unit in Modes 5 and 6. However, CTS did not explicitly cover the condition when moving irradiated fuel assemblies. The additional requirement is necessary to ensure adequate AC power is available when irradiated fuel assemblies are being moved. The addition of this requirement is a more restrictive change to plant operation and is consistent with NUREG-1432. This additional requirement results in the need for a clarifying Note to the Actions. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

M.2 ITS SR 3.8.8.1 requires verification of proper inverter voltage and frequency output. CTS 4.8.3.2 only requires that voltage be present at the inverter output. The addition of this requirement to the Surveillance constitutes a more restrictive change to PVNGS operating practices. This is acceptable because this ensures proper AC output voltage and frequency from the inverter for use in the AC vital buses. This change is consistent with NUREG-1432.

1. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

2. (Intentionally blank)

3. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values are directly transferred from the CTS to the ITS.

4. NUREG-1432 3.8.10 Applicability statement applies to Modes 5 and 6, and during movement of irradiated fuel assemblies. Therefore, if the LCO is not met during movement of irradiated fuel assemblies in Modes 1 through 4 (while operating), this shutdown specification must be entered. The additional text has been added to the ACTION section of the Bases to preclude an unnecessary plant shutdown, if immediate suspension of movement of irradiated fuel assemblies is not possible because of completion of the fuel movement to establish a safe conservative condition. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

   Insert 1 was added to be consistent with the other shutdown specifications, all of which included this sentence.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 ITS 3.8.10 has an additional Required Action (A.2.5) that states, "Declare associated required shutdown cooling subsystem(s) inoperable and not in operation." CTS 3.8.3.2 does not contain this Required Action. The addition of this Required Action constitutes a more restrictive change to PVNGS operating practice. This is acceptable because a required shutdown cooling loop may be inoperable. In this case, the other Required Actions do not adequately address concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the SDC Actions would not be entered. Therefore, a Required Action (A.2.5) is provided to direct declaring SDC inoperable, which results in taking appropriate SDC Actions. This change is consistent with NUREG-1432.

M.2 CTS APPLICABILITY states, "MODES 5 and 6." ITS APPLICABILITY states, "MODES 5 and 6," and adds "During movement of irradiated fuel assemblies." This change places an additional restriction on plant operation during movement of irradiated fuel assemblies (Mode 1 through 6 and defueled). This change assures that systems needed to mitigate a fuel handling accident are available. The CTS would require features necessary to mitigate the events that can lead to core damage during shutdown, and instrument and control capability for monitoring and maintaining the unit in Modes 5 and 6. However, CTS did not explicitly cover the condition when moving irradiated fuel assemblies. The additional requirement is necessary to ensure adequate AC power is available when irradiated fuel assemblies are being moved. The addition of this requirement is a more restrictive change to plant operation and is consistent with NUREG-1432. This additional requirement results in the need for a clarifying Note to the Actions. The Actions are modified by a Note that identifies required Action A.2.3 is not applicable in operational modes. The addition of the note maintains the PVNGS current licensing basis by ensuring there is not an unnecessary suspension of operations involving positive reactivity additions while in MODES 1, 2, 3, and 4.

ITS SECTION 5.0

"ADMINISTRATIVE CONTROL"

REPLACEMENT PAGES

5.5 Programs and Manuals (continued)

5.5.10 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;

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.

5.5.11 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in Regulatory Guide 1.52, Revision 2, and in accordance with Regulatory Guide 1.52, Revision 2 and ANSI N510-1980 at the system flowrate specified below ± 10%.

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass ≤ 1.0 % when tested in accordance with Regulatory Guide 1.52, Revision 2, and ANSI N510-1980, at the system flowrate specified as follows ± 10%:

(continued)

<DOC>
<CTS>
<6.8> 5.5 Programs and Manuals (continued)

<6.8.4.c> 5.5.10 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;

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.

5.5.11 Ventilation Filter Testing Program (VFTP)

<4.7.7>
<4.7.8>

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in ~~[~~Regulatory Guide ~~]~~ 1.52, Revision 2, and in accordance with ~~[~~Regulatory Guide 1.52, Revision 2, ~~ASME~~ ANSI N510-~~1989~~ 1980, ~~and AG-1~~]~~ at the system flowrate specified below ~~[~~± 10%~~]~~. (2) (2)

<4.7.7.b.1, b.3, e>
<4.7.8.b.1, b.3, e>

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass ~~< [0.05]~~ ≤ 1.0 % when tested in accordance with ~~[~~Regulatory Guide 1.52, Revision 2, and ~~ASME~~ ANSI (2)

(continued)

Rev E

5.0 ADMINISTRATIVE CONTROLS

5.7 High Radiation Area

5.7.1 In addition to the provisions of 10CFR20.1601, the following controls provide an alternate method for controlling access to high radiation areas as provided by paragraph 20.1601(c) of 10CFR part 20. High radiation areas, as defined in 10 CFR 20, in which the intensity of radiation is > 100 mrem/hr but ≤ 1000 mrem/hr, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Exposure Permit (REP). Individuals qualified in radiation protection procedures (e.g., Radiation Protection Technicians) or personnel continuously escorted by such individuals may be exempt from the REP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates ≤ 1000 mrem/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device that continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel are aware of them.

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the Radiation Protection Section Leader or designated alternate in the REP.

(continued)

<POC>
<CTS>

<6.0> 5.0 ADMINISTRATIVE CONTROLS

<6.12> 5.7 High Radiation Area

insert 1

5.7.1 ~~Pursuant to 10 CFR 20, paragraph 20.1601(c), in lieu of the requirements of 10 CFR 20.1601, each~~ high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is > 100 mrem/hr but < 1000 mrem/hr, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g., [Health Physics Technicians]) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates ≤ 1000 mrem/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas.

≤ ⑥ Exposure ② REP Radiation Protection

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device that continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel are aware of them.

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the [Radiation Protection Manager] in the RWP.

② REP
Section Leader or designated alternate

5.7.2 In addition to the requirements of Specification 5.7.1, areas with radiation levels > 1000 mrem/hr shall be provided with locked or continuously guarded doors to prevent unauthorized entry and the keys shall be maintained under the administrative control of the Shift Foreman on duty or health physics supervision. Doors shall remain locked except during periods of access by personnel

accessible to personnel ⑥

② Shift Manager ② Radiation Protection

(continued)

such that an individual could receive in 1 hour a dose greater than ⑥

Rev E

NUREG 5.7.1 Markup, "High Radiation Area"

Insert No. 1

In addition to the provisions of 10CFR20.1601, the following controls provide an alternate method for controlling access to high radiation areas as provided by paragraph 20.1601(c) of 10CFR part 20.

1. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

2. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

3. CTS 3.8.1.3.1.2 identifies specific ASTM requirements. NUREG 5.5.13 has requirements that are "in accordance with applicable ASTM Standards." ITS 5.5.13 adds "as referenced in the UFSAR" to the NUREG statement. This change ensures that the location of the applicable ASTM Standards for PVNGS is clearly identified.

4. CTS 3.8.1.3.2 has a sample frequency of 92 days. NUREG 5.5.13 has a frequency of 31 days. ITS 5.5.13 is changed to retain the current licensing basis. Fuel oil degradation is normally a function of water content of the fuel oil. This is due to the climatic conditions at the plant. Due to the arid climate at PVNGS, the 92 day frequency provides sufficient time to detect fuel oil degradation. It should be noted that PVNGS has not experienced fuel oil degradation indicated by viscosity or sediment. Therefore, the current licensing basis has been determined to be appropriate for this surveillance requirement exceeding limits.

5. NUREG 5.6.6, Reactor Coolant System (RCS) Pressure and Temperature Limits Report, is not used in ITS. Therefore, this report is deleted from ITS.

6. TS 5.7.1 and 5.7.2 are changed to reflect the requirements in the latest version of 10 CFR 20 and the current licensing basis for PVNGS. These changes are consistent with the requirements of 10 CFR 20. The wording is changed to clarify that the requirements of the ITS are alternatives in addition to the requirements of 10 CFR 20. Therefore, the current licensing basis has been determined to be appropriate.

7. CTS 6.12.2 Note ** states that the dose measurement is 18 inches from the source of radioactivity. The revision to 10 CFR 20 changed this measurement from 18 inches to 30 centimeters. Therefore, since ITS references the new version of 10 CFR 20, this distance is being updated. This note has been added to ITS 5.7.2 (NUREG exception) to ensure that it is clear where the dose is measured. ITS 5.7.2 provides requirements "In addition" to the requirements in ITS 5.7.1. ITS 5.7.1 references the requirements of 10 CFR 20. This change ensures that the ITS requirements are consistent with 10 CFR 20.

CHAPTER 5.0

A.1

5.0 ADMINISTRATIVE CONTROLS

5.7 ~~6.12~~ HIGH RADIATION AREA

A.8 insert

5.7.1 ~~6.12.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10 CFR Part 20, each~~ High radiation area in which the intensity of radiation is greater than 100 mrem/hr but less than 1000 mrem/hr shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Exposure Permit (REP)*. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.

c. A radiation protection qualified individual (i.e., qualified in radiation protection procedures) with a radiation dose rate monitoring device who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Radiation Protection Section Leader or his designated alternate in the REP.

5.7.2 ~~6.12.2~~ In addition to the requirements of Specification 6.12.1, areas accessible to personnel with radiation levels such that a major portion of the body could receive in 1 hour a dose greater than 1000 mrem shall be provided with locked doors to prevent unauthorized entry, and the keys shall be maintained under the administrative control of the Shift Supervisor on duty and/or radiation protection supervision. Doors shall remain locked except during periods of access by personnel under an approved REP which shall specify the dose rate levels in the immediate work area and the maximum allowable stay time for individuals in that area.

5.7.3 For individual areas accessible to personnel with radiation levels such that a major portion of the body could receive in 1 hour a dose in excess of 1000 mrems**, that are located within large areas, such as PWR containment, where no enclosure exists for purposes of locking, and no enclosure can be reasonably constructed around the individual areas, then that area shall be roped off, conspicuously posted and a flashing light shall be activated as a warning device.

5.7.2 In lieu of the stay time specification of the REP, direct or remote (such as use of closed circuit TV cameras) continuous surveillance may be made by personnel qualified in radiation protection procedures to provide positive exposure control over the activities within the area.

5.7.1 *Radiation Protection personnel or personnel escorted by Radiation Protection personnel shall be exempt from the REP issuance requirement during the performance of their assigned radiation protection duties, provided they are otherwise following plant radiation protection procedures for entry into high radiation areas.

5.7.2 **Measurement made at 18 inches from source of radioactivity. 30 centimeters LB.1

Rev E

CTS 6.12.1 Markup, "High Radiation Area"

Insert No. 1

In addition to the provisions of 10CFR20.1601, the following controls provide an alternate method for controlling access to high radiation areas as provided by paragraph 20.1601(c) of 10CFR part 20.

ADMINISTRATIVE CHANGES (continued)

A.7 CTS 6.8.1.i, 6.8.1.l and 6.8.1.m require written procedures for ODCM implementation, secondary water chemistry program implementation and Post-Accident Sampling System implementation, respectively. ITS 5.4.1.e requires written procedures for all Programs identified in specification 5.5. The ODCM, secondary water chemistry program and Post-Accident Sampling System are included in the programs listed in specification 5.5. Therefore, it is not necessary to identify each type of procedure. Since the requirements are not changed, this is an administrative change and does not impact the margin of safety. This change is consistent with NUREG-1432.

A.8 CTS references 20.106, 20.203, and table II of 10 CFR 20. ITS references paragraph 20.1302, 20.1601, and table 2 respectively, which reflects the latest version of 10 CFR 20. The requirements identified in each specification are the same and this change is an administrative change that changes the references to the revised 10 CFR 20. The wording for CTS 6.12.1 is changed to clarify the requirements of the ITS are alternatives in addition to the requirements of 10 CFR 20. This change is consistent with the current operating practice at PVNGS.

A.9 CTS 6.9.1 requires that "In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Regional Administrator...." ITS requires that "The following reports shall be submitted in accordance with 10 CFR 50.4." 10 CFR 50.4 provides the NRC distribution requirements for report submittal. This change is consistent with NUREG-1432.

A.10 CTS 6.9.1.4 requires that annual reports be submitted within the first calendar quarter of each year. CTS 6.9.1.7 requires that the Annual Radiological Environmental Operating Report be submitted before May 1 of each year. ITS 5.6.1 requires that the Occupational Radiation Exposure Report (annual report) be submitted by April 30 of each year. ITS 5.6.2 requires that the Annual Radiological Environmental Operating Report be submitted by May 15 of each year. Report submittal is not required to assure safe operation of the plant. Additionally there is no requirement for the NRC to approve these reports. Therefore, this change in the submittal dates for these reports does not impact safe plant operation. This change is consistent with NUREG-1432.

Enclosure 4

Improved Technical Specifications (ITS)

PVNGS

Palo Verde Nuclear Generating Station
Units 1, 2, and 3

Improved Technical Specifications

ITS Specifications

PALO VERDE

PALO VERDE NUCLEAR GENERATING STATION
IMPROVED TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS

TABLE OF CONTENTS

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.
AXIAL SHAPE INDEX (ASI)	ASI shall be the power generated in the lower half of the core less the power generated in the upper half of the core, divided by the sum of the power generated in the lower and upper halves of the core. $$ASI = \frac{\text{lower} - \text{upper}}{\text{lower} + \text{upper}}$$
AZIMUTHAL POWER TILT (T_q)	AZIMUTHAL POWER TILT shall be the power asymmetry between azimuthally symmetric fuel assemblies.
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 the entire channel, including the required sensor, alarm, display, and trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION shall include an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

(continued)

1.1 Definitions

CHANNEL CALIBRATION (continued)

The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is calibrated.

CHANNEL CHECK

A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.

CHANNEL FUNCTIONAL TEST

A CHANNEL FUNCTIONAL TEST shall be:

a. Analog and bistable channels – the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including required alarms, interlocks, display and trip functions;

b. Digital computer channels – the use of diagnostic programs to test digital computer hardware and the injection of simulated process data into the channel to verify OPERABILITY, including alarm and trip functions.

The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

(continued)

1.1 Definitions (continued)

CORE ALTERATION	CORE ALTERATION shall be the movement or manipulation of any fuel, sources, or reactivity control components [excluding control element assemblies (CEAs) withdrawn into the upper guide structure], within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP 30, Supplement to Part 1, page 192-212, Table titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."
$\bar{E}$ – AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 15 minutes, making up at least 95% of the total noniodine activity in the coolant.

(continued)

1.1 Definitions (continued)

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
K_{n-1}	K_{n-1} is the K effective calculated by considering the actual CEA configuration and assuming that the fully or partially inserted full-length CEA of highest worth is fully withdrawn.
LEAKAGE	LEAKAGE shall be:

a. Identified LEAKAGE

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

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

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

b. Unidentified LEAKAGE

All LEAKAGE that is not identified LEAKAGE;

(continued)

1.1 Definitions

LEAKAGE (continued)

c. Pressure Boundary LEAKAGE

LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.

MODE

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

OPERABLE - OPERABILITY

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

PHYSICS TESTS

PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are:

a. Described in Chapter 14, Initial Test Program of the UFSAR;

b. Authorized under the provisions of 10 CFR 50.59; or

c. Otherwise approved by the Nuclear Regulatory Commission.

(continued)

1.1 Definitions (continued)

RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3876 MWt.
REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. With any full length CEAs not capable of being fully inserted, the withdrawn reactivity worth of these CEAs must be accounted for in the determination of SDM and b. There is no change in part length CEA position.

(continued)

1.1 Definitions (continued)

STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTIVITY CONDITION (k_{eff})	% RATED THERMAL POWER[a]	COLD LEG TEMPERATURE (°F)
1	Power Operation	≥ 0.99	> 5	NA
2	Startup	≥ 0.99	≤ 5	NA
3	Hot Standby	< 0.99	NA	≥ 350
4	Hot Shutdown[b]	< 0.99	NA	$350 > T_{cold} > 210$
5	Cold Shutdown[b]	< 0.99	NA	≤ 210
6	Refueling[c]	NA	NA	NA

(a) Excluding decay heat.

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

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

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

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

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

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 by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive 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.

EXAMPLES

The following examples illustrate the use of logical connectors.

(continued)

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-1

ACTIONS

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

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

(continued)

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

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

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

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE

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

BACKGROUND

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

DESCRIPTION

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

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

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

(continued)

1.3 Completion Times

DESCRIPTION (continued)

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

a. Must exist concurrent with the <u>first</u> inoperability; and

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

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

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

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

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

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

(continued)

1.3 Completion Times (continued)

EXAMPLES

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

EXAMPLE 1.3-1

ACTIONS

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

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

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

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

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-2

ACTIONS

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

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

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

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

(continued)

1.3 Completion Times

EXAMPLES

<u>EXAMPLE 1.3-2</u> (continued)

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

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

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-3

ACTIONS

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

(continued)

1.3 Completion Times

EXAMPLES

<u>EXAMPLE 1.3-3</u> (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).

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

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more valves inoperable.	A.1 Restore valve(s) to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

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

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

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

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-5

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more valves inoperable.	A.1 Restore valve to OPERABLE status.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

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

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

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-5 (continued)

If the Completion Time associated with a valve in Condition A expires, Condition B is entered for that valve. If the Completion Times associated with subsequent valves in Condition A expire, Condition B is entered separately for each valve and separate Completion Times start and are tracked for each valve. If a valve that caused entry into Condition B is restored to OPERABLE status, Condition B is exited for that valve.

Since the Note in this example allows multiple Condition entry and tracking of separate Completion Times, Completion Time extensions do not apply.

EXAMPLE 1.3-6

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Perform SR 3.x.x.x. 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 3.	6 hours

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-6 (continued)

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.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-7

ACTIONS

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

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

If after Condition A is entered, Required Action A.1 is not met within either the initial 1 hour or any subsequent 8 hour interval from the previous performance (plus the extension allowed by SR 3.0.2), Condition B is entered.

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7 (continued)

The Completion Time clock for Condition A does not stop after Condition B is entered, but continues from the time Condition A was initially entered. If Required Action A.1 is met after Condition B is entered, Condition B is exited and operation may continue in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.

IMMEDIATE COMPLETION TIME

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

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE

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

DESCRIPTION

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

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

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

EXAMPLES

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

1.4 Frequency

EXAMPLES (continued)

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Perform CHANNEL CHECK.	12 hours

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

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

(continued)

1.4 Frequency

EXAMPLES (continued)

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 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 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.

(continued)

1.4 Frequency

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 with power ≥ 25% RTP.

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

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 In MODES 1 and 2, Departure from Nucleate Boiling Ratio (DNBR) shall be maintained at ≥ 1.3.

2.1.1.2 In MODES 1 and 2, the peak Linear Heat Rate (LHR) (adjusted for fuel rod dynamics) shall be maintained at ≤ 21.0 kW/ft.

2.1.2 Reactor Coolant System (RCS) Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained at ≤ 2750 psia.

2.2 SL Violations

2.2.1 If SL 2.1.1.1 or SL 2.1.1.2 is violated, restore compliance and be in MODE 3 within 1 hour.

2.2.2 If SL 2.1.2 is violated:

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

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

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

2.2.4 Within 24 hours, notify the Director, Operations and Vice President, Nuclear Production.

2.2.5 Within 30 days of the violation, a Licensee Event Report (LER) shall be prepared pursuant to 10 CFR 50.73. The LER shall be submitted to the NRC and the Director, Operations and Vice President, Nuclear Production.

(continued)

2.0 SLs

2.2 SL Violations (continued)

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

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2 and LCO 3.0.7.

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

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

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

a. MODE 3 within 7 hours;

b. MODE 5 within 37 hours.

Exceptions to this Specification are stated in the individual Specifications.

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

LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4.

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

(continued)

3.0 LCO APPLICABILITY

LCO 3.0.4 (continued)	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. Exceptions to this Specification are stated in the individual Specifications. LCO 3.0.4 is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4.
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 5.5.15, "Safety Function Determination Program (SFDP)." If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

(continued)

3.0 LCO APPLICABILITY (continued)

LCO 3.0.6 (continued)	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.
LCO 3.0.7	Special test exception (STE) LCOs in each applicable LCO section allow specified Technical Specifications (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with STE LCOs is optional. When an STE LCO is desired to be met but is not met, the ACTIONS of the STE LCO shall be met. When an STE LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with the other applicable Specifications.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during the MODES or other specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on inoperable equipment or variables outside specified limits.

SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

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

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

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance.

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

(continued)

3.0 SR APPLICABILITY

SR 3.0.3 (continued)	When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.
SR 3.0.4	Entry into a MODE or other specified condition in the Applicability of an LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit. SR 3.0.4 is only applicable for entry into a MODE or other specified condition in the Applicability in MODES 1, 2, 3, and 4.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM) - Reactor Trip Breakers Open

LCO 3.1.1 SDM shall be ≥ the value in the COLR.

APPLICABILITY: MODES 3, 4, and 5 with the Reactor Trip Breakers Open or the CEA drive system not capable of CEA withdrawal.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM is ≥ the value in the COLR.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 SHUTDOWN MARGIN (SDM) - Reactor Trip Breakers Closed

LCO 3.1.2 Reactivity shall be controlled by:

a. SDM shall be ≥ the value in the COLR.

b. K_{N-1} shall be < 0.99 when $T_c \leq 500°F$.

c. Reactor criticality shall not be achieved with shutdown group CEA movement.

APPLICABILITY: MODES 3, 4, and 5 with the Reactor Trip Breakers Closed and the CEA drive system capable of CEA withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes
B. K_{N-1} not within limit when $T_c \leq 500°F$.	B.1 Vary CEA position to restore within limits.	15 minutes
<u>OR</u>	<u>AND</u>	
Reactor criticality can be achieved by shutdown group CEA movement.	B.2 Initiate boration to restore within limits.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify SDM is ≥ the value in the COLR.	24 hours
SR 3.1.2.2	-------------------NOTE------------------- Only required if $T_c \leq 500°F$. -- Verify $K_{N-1} < 0.99$.	24 hours
SR 3.1.2.3	Verify criticality cannot be achieved with shutdown group CEA movement.	24 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Reactivity Balance

LCO 3.1.3 The core reactivity balance shall be within ± 1% $\Delta k/k$ of 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 and SRs.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	-------------------NOTES------------------- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. ---	
	Verify overall core reactivity balance is within ± 1.0% $\Delta k/k$ of predicted values.	Prior to entering MODE 1 after fuel loading AND -----NOTE----- Only required after 60 EFPD ------------- 31 EFPD

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Moderator Temperature Coefficient (MTC)

LCO 3.1.4 The MTC shall be maintained within the limits specified in the COLR, and a maximum positive limit that varies linearly from 0.5 E-4 $\Delta k/k/°F$ at 0% RTP to 0.0 $\Delta k/k/°F$ at 100% RTP.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	-------------------NOTE------------------- This Surveillance is not required to be performed prior to entry into MODE 2. -- Verify MTC is within the upper limit specified in the COLR.	Prior to entering MODE 1 after each fuel loading

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	-------------------NOTES------------------ 1. This Surveillance is not required to be performed prior to entry into MODE 1 or 2. 2. If the MTC is more negative than the COLR limit when extrapolated to the end of cycle, SR 3.1.4.2 may be repeated. Shutdown must occur prior to exceeding the minimum allowable boron concentration at which MTC is projected to exceed the lower limit. ---	
	Verify MTC is within the lower limit specified in the COLR.	Each fuel cycle within 7 effective full power days (EFPD) of reaching 40 EFPD core burnup AND Each fuel cycle within 7 EFPD of reaching $\frac{2}{3}$ of expected core burnup

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Control Element Assembly (CEA) Alignment

LCO 3.1.5 All full length CEAs shall be OPERABLE, and all full and part length CEAs shall be aligned to within 6.6 inches (indicated position) of all other CEAs in their respective groups.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more CEAs trippable and misaligned from its group by > 6.6 inches and ≤ 9.9 inches. OR One CEA trippable and misaligned from its group by > 9.9 inches.	A.1 Reduce THERMAL POWER in accordance with the limits in the COLR. AND A.2 Restore CEA alignment.	1 hour 2 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Only one CEA position indicator channel OPERABLE for one CEA per CEA Group.	B.1	Restore at least two position indicator channels to OPERABLE status.	6 hours
	<u>OR</u>		
	B.2	Verify the CEA Group(s) with the inoperable position indicators are fully withdrawn or fully inserted while maintaining the insertion limits of LCO 3.1.6, LCO 3.1.7 and LCO 3.1.8.	6 hours <u>AND</u> Once per 12 hours thereafter.
C. Required Action and associated Completion Time of Condition A or B not met <u>OR</u> One or more full length CEAs untrippable.	C.1	Be in MODE 3.	6 hours
D. Two or more CEAs trippable and misaligned from their group by > 9.9 inches.	D.1	Open the reactor trip breakers.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify the indicated position of each full and part length CEA is within 6.6 inches of all other CEAs in its group.	12 hours
SR 3.1.5.2	Verify that, for each CEA, its OPERABLE CEA position indicator channels indicate within 5.2 inches of each other.	12 hours
SR 3.1.5.3	Verify full length CEA freedom of movement (trippability) by moving each individual full length CEA that is not fully inserted in the core at least 5 inches.	92 days
SR 3.1.5.4	Perform a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter channel.	18 months
SR 3.1.5.5	Verify each full length CEA drop time $\leq$ 4.0 seconds.	Prior to reactor criticality, after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Shutdown Control Element Assembly (CEA) Insertion Limits

LCO 3.1.6 All shutdown CEAs shall be withdrawn to ≥ 144.75 inches.

APPLICABILITY: MODE 1,
MODE 2 with any regulating CEA not fully inserted.

---------------------------NOTE---------------------------
This LCO is not applicable while performing SR 3.1.5.3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One shutdown CEA not within limit.	A.1 Restore shutdown CEA(s) to within limit.	2 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify each shutdown CEA is withdrawn ≥ 144.75 inches.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Regulating Control Element Assembly (CEA) Insertion Limits

LCO 3.1.7 The power dependent insertion limit (PDIL) alarm circuit shall be OPERABLE, and with the Core Operating Limit Supervisory System (COLSS) in service or with COLSS out of service, the regulating CEA groups shall be limited to the withdrawal sequence and insertion limits specified in the COLR and the associated time restraints.

APPLICABILITY: MODES 1 and 2.

---------------------------NOTE---------------------------
This LCO is not applicable while conducting SR 3.1.5.3 or for up to 2 hours following a reactor power cutback operation.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Regulating CEA groups inserted beyond the transient insertion limit with COLSS in service or with COLSS out of service.	A.1 Restore regulating CEA groups to within limits.	2 hours
	<u>OR</u>	
	A.2 Reduce THERMAL POWER to less than or equal to the fraction of RTP allowed by the CEA group position and insertion limits specified in the COLR.	2 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Regulating CEA groups inserted between the short term steady state insertion limit and the transient insertion limit for > 4 hours per 24 hour interval with COLSS in service or with COLSS out of service.	B.1 Restrict increases in THERMAL POWER to ≤ 5% RTP per hour.	15 minutes
C. Regulating CEA groups inserted between the long term steady state insertion limit and the transient insertion limit for intervals > 5 effective full power days (EFPD) per 30 EFPD interval or > 14 EFPD per 365 EFPD interval with COLSS in service or with COLSS out of service.	C.1 Restore regulating CEA groups to within limits.	2 hours
D. PDIL alarm circuit inoperable.	D.1 Perform SR 3.1.7.1.	1 hour AND Once per 4 hours thereafter
E. Required Actions and associated Completion Times not met.	E.1 Be in MODE 3.	6 hours

[illegible] [illegible] [illegible]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	-------------------NOTE------------------- This Surveillance is not required to be performed prior to entry into MODE 2. -- Verify each regulating CEA group position is within its insertion limits.	12 hours
SR 3.1.7.2	Verify the accumulated times during which the regulating CEA groups are inserted beyond the steady state insertion limits but within the transient insertion limits.	24 hours
SR 3.1.7.3	Verify PDIL alarm circuit is OPERABLE.	31 days

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 Part Length Control Element Assembly (CEA) Insertion Limits

LCO 3.1.8 The part length CEA groups shall be limited to the insertion limits specified in the COLR.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Part length CEA groups inserted beyond the transient insertion limit.	A.1 Restore part length CEA groups to within the limit.	2 hours
	OR	
	A.2 Reduce THERMAL POWER to less than or equal to that fraction of RTP specified in the COLR.	2 hours
B. Part length CEA groups inserted between the long term steady state insertion limit and the transient insertion limit for intervals ≥ 7 effective full power days (EFPD) per 30 EFPD or ≥ 14 EFPD per 365 EFPD interval.	B.1 Restore part length CEA groups to within the long term steady state insertion limit.	2 hours

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.8.1 Verify part length CEA group position.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.9 Special Test Exception (STE) – SHUTDOWN MARGIN (SDM)

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

LCO 3.1.2, "SHUTDOWN MARGIN (SDM)-Reactor Trip Breakers Closed";
LCO 3.1.6, "Shutdown Control Element Assembly (CEA) Insertion Limits", and
LCO 3.1.7 "Regulating Control Element Assembly (CEA) Insertion Limits"

may be suspended for measurement of CEA worth, provided shutdown reactivity equivalent to at least the highest estimated CEA worth (of those CEAs actually withdrawn) is available for trip insertion or the reactor is subcritical by at least the reactivity equivalent of the highest CEA worth.

APPLICABILITY: MODES 2 and 3 during PHYSICS TESTS.

---------------------------NOTE---------------------------
Operation in MODE 3 shall be limited to 6 consecutive hours.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Any full length CEA not fully inserted and less than the required shutdown reactivity available for trip insertion. OR All full length CEAs inserted and the reactor subcritical by less than the above required shutdown reactivity equivalent.	A.1 Initiate boration to restore required shutdown reactivity.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify that the position of each CEA not fully inserted is within the acceptance criteria for available negative reactivity addition.	2 hours
SR 3.1.9.2	Verify each full length CEA not fully inserted is capable of full insertion when tripped from at least the 50% withdrawn position.	Within 7 days prior to reducing SDM requirements to less than the limits of LCO 3.1.2
SR 3.1.9.3	------------------NOTE------------------- Only required to be performed in Mode 3. --------------------------------------- Verify that with all full length CEAs fully inserted, the reactor is subcritical within the acceptance criteria.	2 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.10 Special Test Exceptions (STE) – MODES 1 and 2

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

LCO 3.1.4, "Moderator Temperature Coefficient (MTC)";
LCO 3.1.5, "Control Element Assembly (CEA) Alignment";
LCO 3.1.6, "Shutdown Control Element Assembly (CEA) Insertion Limits";
LCO 3.1.7, "Regulating Control Element Assembly (CEA) Insertion Limits";
LCO 3.1.8, "Part Length CEA Insertion Limits";
LCO 3.2.2, "Planar Radial Peaking Factors (Fxy)";
LCO 3.2.3, "AZIMUTHAL POWER TILT (Tq)";
LCO 3.2.5, "AXIAL SHAPE INDEX (ASI)"; and
LCO 3.3.3, "Control Element Assembly Calculators (CEACs)"

may be suspended, provided THERMAL POWER is restricted to the test power plateau, which shall not exceed 85% RTP.

APPLICABILITY: MODES 1 and 2 during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Test power plateau exceeded.	A.1 Reduce THERMAL POWER to less than or equal to the test power plateau.	15 minutes
B. Required Action and associated Completion Time not met.	B.1 Suspend PHYSICS TESTS.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.10.1	Verify THERMAL POWER equal to or less than the test power plateau.	1 hour

3.1 REACTIVITY CONTROL SYSTEMS

3.1.11 Special Test Exceptions (STE) — Reactivity Coefficient Testing

LCO 3.1.11 During performance of PHYSICS TESTS, the requirements of:

LCO 3.1.7, "Regulating Control Element Assembly (CEA) Insertion Limits";
LCO 3.1.8, "Part Length Control Element Assembly (CEA) Insertion Limits;" and
LCO 3.4.1, "RCS Pressure, Temperature and Flow limits" (LCO 3.4.1.b, RCS Cold Leg Temperature only)

may be suspended, provided LHR and DNBR do not exceed the limits in the COLR.

APPLICABILITY: MODE 1 with Thermal Power > 20% RTP during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LHR or DNBR outside the limits specified in the COLR.	A.1 Reduce THERMAL POWER to restore LHR and DNBR to within limits.	15 minutes
B. Required Action and associated Completion Time not met.	B.1 Suspend PHYSICS TESTS.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.11.1 Verify LHR and DNBR do not exceed limits by performing SR 3.2.1.1 and SR 3.2.4.1.	Continuously

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Linear Heat Rate (LHR)

LCO 3.2.1 LHR shall not exceed the limits specified in the COLR.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Core Operating Limit Supervisory System (COLSS) calculated core power exceeds the COLSS calculated core power operating limit based on LHR.	A.1 Restore LHR to within limits.	1 hour
B. LHR not within region of acceptable operation when the COLSS is out of service.	B.1 Determine trend in LHR. AND B.2.1 With an adverse trend, restore LHR to within limit. OR B.2.2 With no adverse trend, restore LHR to within limits.	Once per 15 minutes 1 hour 4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	-------------------NOTE------------------- 1. Only applicable when COLSS is out of service. With COLSS in service, LHR is continuously monitored. 2. Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. -- Verify LHR, as indicated on any OPERABLE local power density channel, is within its limits.	2 hours
SR 3.2.1.2	Verify the COLSS margin alarm actuates at a THERMAL POWER equal to or less than the core power operating limit based on LHR.	31 days

3.2 POWER DISTRIBUTION LIMITS

3.2.2 Planar Radial Peaking Factors (F_{xy})

LCO 3.2.2 The measured Planar Radial Peaking Factors (F_{xy}^{M}) shall be equal to or less than the Planar Radial Peaking Factors (F_{xy}^{C}). (These factors are used in the Core Operating Limit Supervisory System (COLSS) and in the Core Protection Calculators (CPCs)).

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. $F_{xy}^{M} > F_{xy}^{C}$.	A.1.1	Adjust addressable CPC constants to increase the multiplier applied to planar radial peaking by a factor $\geq F_{xy}^{M}/F_{xy}^{C}$.	6 hours
		AND	
	A.1.2	Maintain a margin to the COLSS operating limits of $[(F_{xy}^{M}/F_{xy}^{C})-1.0] \times 100\%$.	6 hours
	OR		
	A.2	Adjust the affected F_{xy}^{C} used in the COLSS and CPCs to a value greater than or equal to the measured F_{xy}^{M}.	6 hours
	OR		
	A.3	Reduce THERMAL POWER to $\leq$ 20% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify measured F_{xy}^{M} obtained using the Incore Detector System is equal to or less than the value of F_{xy}^{C} used in the COLSS and CPCs.	Once after each fuel loading with THERMAL POWER > 40% RTP but prior to operations above 70% RTP <u>AND</u> 31 EFPD thereafter

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AZIMUTHAL POWER TILT (T_q)

LCO 3.2.3 The measured T_q shall be less than or equal to the T_q allowance used in the Core Protection Calculators (CPCs).

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Measured T_q greater than the allowance used in the CPCs and within the limit in the COLR with COLSS in service OR Measured T_q greater than the allowance in the CPCs and $\leq$ 0.03 with COLSS out of service.	A.1 Restore measured T_q. OR A.2 Adjust the T_q allowance in the CPCs to greater than or equal to the measured value.	2 hours 2 hours
B. Measured T_q not within the limit in the COLR with COLSS in service. OR Measured T_q > 0.03 with COLSS out of service.	------------NOTE------------ Required Action B.5 must be completed if power reduction commences prior to restoring T_q to within the limit. ---------------------------- B.1 Reduce THERMAL POWER to ≤ 50% RTP. AND	 4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Reduce Variable Overpower trip setpoints to ≤ 55% RTP.	16 hours
	<u>AND</u>		
	B.3	Restore the measured T_q to less than the T_q allowance used in the CPCs.	Prior to increasing THERMAL POWER
	<u>AND</u>		
	B.4	Correct the cause for measured T_q not within limit.	Prior to increasing THERMAL POWER > 50% RTP.
	<u>AND</u>		
	B.5	Subsequent to power operation > 50% RTP, verify measured T_q is within the limit.	Once per hour for 12 hours <u>OR</u> Until verified at ≥ 95% RTP
C. Required Actions and associated Completion Times not met.	C.1	Reduce THERMAL POWER to ≤ 20%.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	-------------------NOTES------------------- 1. Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. 2. Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. --- Calculate T_q and verify it is within the limit.	12 hours
SR 3.2.3.2	Verify COLSS azimuthal tilt alarm is actuated at a T_q value less than the T_q value used in the CPCs.	31 days
SR 3.2.3.3	Independently confirm the validity of the COLSS calculated T_q by use of the incore detectors.	31 EFPD

3.2 POWER DISTRIBUTION LIMITS

3.2.4 Departure From Nucleate Boiling Ratio (DNBR)

LCO 3.2.4 The DNBR shall be maintained by one of the following methods:

a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both Control Element Assembly Calculators (CEACs) are OPERABLE);

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR (when COLSS is in service and neither CEAC is OPERABLE);

c. Operating within the region of acceptable operation specified in the COLR using any OPERABLE Core Protection Calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE); or

d. Operating within the region of acceptable operation specified in the COLR using any OPERABLE CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. COLSS calculated core power not within limit.	A.1 Restore the DNBR to within limit.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. DNBR outside the region of acceptable operation when COLSS is out of service.	B.1 Determine trend in DNBR. AND B.2.1 With an adverse trend, restore DNBR to within limit. OR B.2.2 With no adverse trend, restore DNBR to within limit.	Once per 15 minutes 1 hour 4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	-------------------NOTE------------------- 1. Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. 2. Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. -- Verify DNBR, as indicated on any OPERABLE DNBR channels, is within the limit of the COLR, as applicable.	2 hours
SR 3.2.4.2	Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	31 days

3.2 POWER DISTRIBUTION LIMITS

3.2.5 AXIAL SHAPE INDEX (ASI)

LCO 3.2.5 ASI shall be within the limits specified in the COLR.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Core average ASI not within limits.	A.1 Restore ASI to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 20% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.5.1 ------------------NOTE------------------- Not required to be performed until 2 hours after MODE 1 with THERMAL POWER > 20% RTP. --- Verify ASI is within limits.	12 hours

3.3 INSTRUMENTATION

3.3.1 Reactor Protective System (RPS) Instrumentation — Operating

LCO 3.3.1 Four RPS trip and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one automatic RPS trip channel inoperable.	A.1	Place channel in bypass or trip.	1 hour
	<u>AND</u>		
	A.2	Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
B. One or more Functions with two automatic RPS trip channels inoperable.	B.1	--------NOTE-------- LCO 3.0.4 is not applicable. -------------------- Place one channel in bypass and the other in trip.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with one automatic bypass removal channel inoperable.	C.1 Disable bypass channel.	1 hour
	OR	
	C.2.1 Place affected automatic trip channel in bypass or trip.	1 hour
	AND	
	C.2.2 Restore bypass removal channel and associated automatic trip channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
D. One or more Functions with two automatic bypass removal channels inoperable.	------------NOTE------------ LCO 3.0.4 is not applicable. ----------------------------	
	D.1 Disable bypass channels.	1 hour
	OR	
	D.2 Place one affected automatic trip channel in bypass and place the other in trip.	1 hour
E. One or more core protection calculator (CPC) channels with a cabinet high temperature alarm.	E.1 Perform CHANNEL FUNCTIONAL TEST on affected CPC.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. One or more CPC channels with three or more autorestarts during a 12 hour period.	F.1	Perform CHANNEL FUNCTIONAL TEST on affected CPC.	24 hours
G. Required Action and associated Completion Time not met.	G.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------
Refer to Table 3.3.1-1 to determine which SR shall be performed for each RPS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform a CHANNEL CHECK of each RPS instrument channel.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2	-------------------NOTE------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 70% RTP. -- Verify total Reactor Coolant System (RCS) flow rate as indicated by each CPC is less than or equal to the RCS total flow rate. If necessary, adjust the CPC addressable constant flow coefficients such that each CPC indicated flow is less than or equal to the RCS flow rate.	12 hours
SR 3.3.1.3	Check the CPC autorestart count.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.4	-------------------NOTES------------------ 1. Not required to be performed until 12 hours after THERMAL POWER ≥ 20% RTP. 2. The daily calibration may be suspended during PHYSICS TESTS, provided the calibration is performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau. -- Perform calibration (heat balance only) and adjust the linear power level signals and the CPC addressable constant multipliers to make the CPC ΔT power and CPC nuclear power calculations agree with the calorimetric, if the absolute difference is ≥ 2% when THERMAL POWER is ≥ 80% RTP. Between 20% and 80% RTP the maximum difference is -0.5% to 10%.	24 hours
SR 3.3.1.5	-------------------NOTE------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 70% RTP. -- Verify total RCS flow rate indicated by each CPC is less than or equal to the RCS flow determined either using the reactor coolant pump differential pressure instrumentation and the ultrasonic flow meter adjusted pump curves or by calorimetric calculations.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.6	-------------------NOTE------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 15% RTP. -- Verify linear power subchannel gains of the excore detectors are consistent with the values used to establish the shape annealing matrix elements in the CPCs.	31 days
SR 3.3.1.7	-------------------NOTES------------------- 1. The CPC CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC. 2. Not required to be performed for logarithmic power level channels until 2 hours after reducing THERMAL POWER below 1E-4% RTP. -- Perform CHANNEL FUNCTIONAL TEST on each channel.	92 days
SR 3.3.1.8	-------------------NOTE------------------- Neutron detectors are excluded from the CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION of the power range neutron flux channels.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	------------------NOTE------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION on each channel, including bypass removal functions.	18 months
SR 3.3.1.10	Perform a CHANNEL FUNCTIONAL TEST on each CPC channel.	18 months
SR 3.3.1.11	Using the incore detectors, verify the shape annealing matrix elements to be used by the CPCs.	Once after each refueling prior to exceeding 70% RTP
SR 3.3.1.12	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	Once within 92 days prior to each reactor startup
SR 3.3.1.13	------------------NOTE------------------ Neutron detectors are excluded. -- Verify RPS RESPONSE TIME is within limits.	18 months on a STAGGERED TEST BASIS

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Variable Over Power	1,2	SR 3.3.1.1 SR 3.3.1.4 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.8 SR 3.3.1.9 SR 3.3.1.13	Ceiling ≤ 111.0% RTP Band ≤ 9.9% RTP Incr. Rate ≤ 11.0%/min RTP Decr. Rate > 5%/sec RTP
2. Logarithmic Power Level – High[(a)]	2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	≤ 0.011%
3. Pressurizer Pressure – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 2388 psia
4. Pressurizer Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.12 SR 3.3.1.13	≥ 1821 psia
5. Containment Pressure – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 3.2 psig
6. Steam Generator #1 Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 890 psia
7. Steam Generator #2 Pressure – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 890 psia

(continued)

(a) Trip may be bypassed when THERMAL POWER is > 1E-4% RTP. Bypass shall be automatically removed when THERMAL POWER is ≤ 1E-4% RTP.

Table 3.3.1-1 (page 2 of 3)
Reactor Protective System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8. Steam Generator #1 Level – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
9. Steam Generator #2 Level – Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≥ 43.7%
10. Steam Generator #1 Level – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
11. Steam Generator #2 Level – High	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	≤ 91.5%
12. Reactor Coolant Flow, Steam Generator #1-Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.118 psid/sec. Floor: ≥ 11.7 psid Step: ≤ 10.2 psid
13. Reactor Coolant Flow, Steam Generator #2-Low	1,2	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.13	Ramp: ≤ 0.118 psid/sec. Floor: ≥ 11.7 psid Step: ≤ 10.2 psid

(continued)

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
14. Local Power Density – High[b]	1,2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.11 SR 3.3.1.12 SR 3.3.1.13	≤ 21.0 kW/ft
15. Departure From Nucleate Boiling Ratio (DNBR) – Low[b]	1,2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.7 SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.11 SR 3.3.1.12 SR 3.3.1.13	≥ 1.30

(b) Trip may be bypassed when THERMAL POWER is < 1E-4% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ 1E-4% RTP.

3.3 INSTRUMENTATION

3.3.2 Reactor Protective System (RPS) Instrumentation – Shutdown

LCO 3.3.2 Four RPS trip and bypass removal channels for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

------------------------------------NOTE------------------------------------
Separate condition entry is allowed for each RPS Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more functions with one automatic RPS trip channel inoperable.	A.1 Place channel in bypass or trip.	1 hour
	AND	
	A.2 Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
B. One or more functions with two automatic RPS trip channels inoperable.	B.1 --------NOTE-------- LCO 3.0.4 is not applicable. -------------------- Place one channel in bypass and place the other in trip.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more functions with one automatic bypass removal channel inoperable.	C.1	Disable bypass channel.	1 hour
	OR		
	C.2.1	Place affected channel in bypass or trip.	1 hour
	AND		
	C.2.2	Restore bypass removal channel and associated automatic trip channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
D. One or more functions with two automatic bypass removal channels inoperable.	------------NOTE------------ LCO 3.0.4 is not applicable. ----------------------------		
	D.1	Disable bypass channels.	1 hour
	OR		
	D.2	Place one affected automatic trip channel bypass and place the other in trip.	1 hour
E. Required Action and associated Completion Time not met.	E.1	Open all RTCBs.	1 hour

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.2-1 to determine which SR shall be performed for each RPS function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform a CHANNEL CHECK of each RPS instrument channel.	12 hours
SR 3.3.2.2	Perform a CHANNEL FUNCTIONAL TEST on each channel.	92 days
SR 3.3.2.3	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	Once within 92 days prior to each reactor startup
SR 3.3.2.4	------------------NOTE------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform a CHANNEL CALIBRATION on each channel, including bypass removal function.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.5	-------------------NOTE------------------- Neutron detectors are excluded. -- Verify RPS RESPONSE TIME is within limits.	18 months on a STAGGERED TEST BASIS

Table 3.3.2-1
Reactor Protective System Instrumentation - Shutdown

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALVE
1. Logarithmic Power Level-High[(d)]	3[(a)], 4[(a)], 5[(a)]	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.5	≤ 0.011% RTP[(c)]
2. Steam Generator #1 Pressure-Low[(b)]	3[(a)]	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.5	≥ 890 psia
3. Steam Generator #2 Pressure-Low[(b)]	3[(a)]	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.5	≥ 890 psia

(a) With any Reactor Trip Circuit Breakers (RTCBs) closed and any control element assembly capable of being withdrawn.

(b) The setpoint may be decreased as steam pressure is reduced, provided the margin between steam pressure and the setpoint is maintained ≤ 200 psig. The setpoint shall be automatically increased to the normal setpoint as steam pressure is increased.

(c) The setpoint must be reduced to ≤ 1E-4% RTP when less than 4 RCPs are running.

(d) Trip may be bypassed when THERMAL POWER is > 1E-4% RTP. Bypass shall be automatically removed when THERMAL POWER is ≤ 1E-4% RTP.

3.3 INSTRUMENTATION

3.3.3 Control Element Assembly Calculators (CEACs)

LCO 3.3.3 Two CEACs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CEAC inoperable.	A.1 Perform SR 3.1.5.1. AND A.2 Restore CEAC to OPERABLE status.	Once per 4 hours 7 days
B. Required Action and associated Completion Time of Condition A not met. OR Both CEACs inoperable.	B.1 Verify the departure from nucleate boiling ratio requirement of LCO 3.2.4, "Departure from Nucleate Boiling Ratio (DNBR)," is met. AND	4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Verify all full length and part length control element assembly (CEA) groups are fully withdrawn and maintained fully withdrawn, except during Surveillance testing pursuant to SR 3.1.5.3 or for control, when CEA group #5 may be inserted to a maximum of 127.5 inches withdrawn.	4 hours
	<u>AND</u>		
	B.3	Verify the "RSPT/CEAC Inoperable" addressable constant in each core protection calculator (CPC) is set to indicate that both CEACs are inoperable.	4 hours
	<u>AND</u>		
	B.4	Verify the Control Element Drive Mechanism Control System is placed in "STANDBY MODE" and maintained in "STANDBY MODE," except during CEA motion permitted by Required Action B.2.	4 hours
	<u>AND</u>		
	B.5	Perform SR 3.1.5.1.	Once per 4 hours
	<u>AND</u>		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.6	Disable the Reactor Power Cutback System (RPCS)	4 hours
C. Receipt of a CPC channel B or C cabinet high temperature alarm.	C.1	Perform CHANNEL FUNCTIONAL TEST on affected CEAC(s).	12 hours
D. One or two CEACs with three or more auto restarts during a 12 hour period.	D.1	Perform CHANNEL FUNCTIONAL TEST on affected CEAC.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform a CHANNEL CHECK.	12 hours
SR 3.3.3.2	Check the CEAC auto restart count.	12 hours
SR 3.3.3.3	Perform a CHANNEL FUNCTIONAL TEST.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.3.4	Perform a CHANNEL CALIBRATION.	18 months
SR 3.3.3.5	Perform a CHANNEL FUNCTIONAL TEST.	18 months
SR 3.3.3.6	Verify the isolation characteristics of each CEAC isolation amplifier.	18 months

3.3 INSTRUMENTATION

3.3.4 Reactor Protective System (RPS) Logic and Trip Initiation

LCO 3.3.4 Six channels of RPS Matrix Logic, four channels of RPS Initiation Logic, four channels of reactor trip circuit breakers (RTCBs), and four channels of Manual Trip shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Matrix Logic channel inoperable. OR Three Matrix Logic channels inoperable due to a common power source failure de-energizing three matrix power supplies.	A.1 Restore channel to OPERABLE status.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- RTCBs associated with one inoperable channel may be closed for up to 1 hour for the performance of an RPS CHANNEL FUNCTIONAL TEST. --------------------- One channel of Manual Trip, RTCB, or Initiation Logic inoperable in MODE 1 or 2.	B.1 Open the affected RTCB. OR B.2.1 Open the redundant RTCB in the affected Trip Leg. AND B.2.2 Open the affected RTCB.	1 hour 1 hour 48 hours
C. ---------NOTE--------- RTCBs associated with one inoperable channel may be closed for up to 1 hour for the performance of an RPS CHANNEL FUNCTIONAL TEST. --------------------- One channel of Manual Trip, RTCB, or Initiation Logic inoperable in MODE 3, 4, or 5.	C.1 Open the affected RTCB.	48 hours
D. Two channels of RTCBs, Manual Trip or Initiation Logic affecting the same trip leg inoperable.	D.1 Open the affected RTCBs.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, or D not met. OR One or more Functions with more than one Manual Trip, Matrix Logic, Initiation Logic, or RTCB channel inoperable for reasons other than Condition A or D.	E.1 Be in MODE 3. AND E.2 Open all RTCBs.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform a CHANNEL FUNCTIONAL TEST on each RPS Logic channel and Manual Trip channel.	92 days
SR 3.3.4.2	Perform a CHANNEL FUNCTIONAL TEST, including separate verification of the undervoltage and shunt trips, on each RTCB.	18 months
SR 3.3.4.3	Perform a CHANNEL FUNCTIONAL TEST on each RTCB.	31 days

3.3 INSTRUMENTATION

3.3.5 Engineered Safety Features Actuation System (ESFAS) Instrumentation

LCO 3.3.5 Four ESFAS trip and bypass removal channels for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5-1.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one automatic ESFAS trip channel inoperable.	A.1	Place channel in bypass or trip.	1 hour
	AND		
	A.2	Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
B. One or more Functions with two automatic ESFAS trip channels inoperable.	B.1	--------NOTE--------- LCO 3.0.4 is not applicable. ---------------------	
		Place one channel in bypass and the other in trip.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more Functions with one automatic bypass removal channel inoperable.	C.1	Disable bypass channel.	1 hour
	OR		
	C.2.1	Place affected automatic trip channel in bypass or trip.	1 hour
	AND		
	C.2.2	Restore bypass removal channel and associated automatic trip channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
D. One or more Functions with two automatic bypass removal channels inoperable.	-----------NOTE----------- LCO 3.0.4 is not applicable. ---------------------------		
	D.1	Disable bypass channels.	1 hour
	OR		
	D.2	Place one affected automatic trip channel in bypass and place the other in trip.	1 hour
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform a CHANNEL CHECK of each ESFAS channel.	12 hours
SR 3.3.5.2	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS channel.	92 days
SR 3.3.5.3	Perform a CHANNEL CALIBRATION of each ESFAS channel, including bypass removal functions.	18 months
SR 3.3.5.4	Verify ESF RESPONSE TIME is within limits.	18 months on a STAGGERED TEST BASIS
SR 3.3.5.5	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal channel.	Once within 92 days prior to each reactor startup

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	ALLOWABLE VALUE
1. Safety Injection Actuation Signal		
a. Containment Pressure – High	1,2,3	≤ 3.2 psig
b. Pressurizer Pressure – Low[(a)]		≥ 1821 psia
2. Containment Spray Actuation Signal		
a. Containment Pressure – High High	1,2,3	≤ 8.9 psig
3. Containment Isolation Actuation Signal		
a. Containment Pressure – High	1,2,3	≤ 3.2 psig
b. Pressurizer Pressure – Low[(a)]		≥ 1821 psia
4. Main Steam Isolation Signal[(c)]		
a. Steam Generator #1 Pressure–Low[(b)]	1,2,3	≥ 890 psia
b. Steam Generator #2 Pressure–Low[(b)]		≥ 890 psia
c. Steam Generator #1 Level-High		≤ 91.5%
d. Steam Generator #2 Level-High		≤ 91.5%
e. Containment Pressure-High		≤ 3.2 psig
5. Recirculation Actuation Signal		
a. Refueling Water Storage Tank Level–Low	1,2,3	≥ 6.9 and ≤ 7.9%
6. Auxiliary Feedwater Actuation Signal SG #1 (AFAS-1)		
a. Steam Generator #1 Level–Low	1,2,3	≥ 25.3%
b. SG Pressure Difference–High		≤ 192 psid
7. Auxiliary Feedwater Actuation Signal SG #2 (AFAS-2)		
a. Steam Generator #2 Level–Low	1,2,3	≥ 25.3%
b. SG Pressure Difference–High		≤ 192 psid

(a) The setpoint may be decreased to a minimum value of 100 psia, as pressurizer pressure is reduced, provided the margin between pressurizer pressure and the setpoint is maintained ≤ 400 psia or ≥ 140 psia greater than the saturation pressure of the RCS cold leg when the RCS cold leg temperature is ≥ 485°F. Trips may be bypassed when pressurizer pressure is < 400 psia. Bypass shall be automatically removed when pressurizer pressure is ≥ 500 psia. The setpoint shall be automatically increased to the normal setpoint as pressurizer pressure is increased.

(b) The setpoint may be decreased as steam pressure is reduced, provided the margin between steam pressure and the setpoint is maintained ≤ 200 psig. The setpoint shall be automatically increased to the normal setpoint as steam pressure is increased.

(c) The Main Steam Isolation Signal (MSIS) Function (Steam Generator Pressure – Low, Steam Generator Level-High and Containment Pressure – High signals) is not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed.

3.3 INSTRUMENTATION

3.3.6 Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip

LCO 3.3.6 Six channels of ESFAS Matrix Logic, four channels of ESFAS Initiation Logic, two channels of Actuation Logic, and four channels of Manual Trip shall be OPERABLE for each Function in Table 3.3.6-1.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one Matrix Logic channel inoperable. OR Three Matrix Logic channels are inoperable due to a common power source failure de-energizing three matrix power supplies.	A.1 Restore channel to OPERABLE status.	48 hours
B. One or more Functions with one Manual Trip or Initiation Logic channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more Functions with two Initiation Logic channels or Manual Trip channels affecting the same trip leg inoperable.	C.1	Open at least one contact in the affected trip leg of both ESFAS Actuation Logics.	Immediately
	<u>AND</u>		
	C.2	Restore channels to OPERABLE status.	48 hours
D. One or more Functions with one Actuation Logic channel inoperable.	D.1	--------NOTE--------- One channel of Actuation Logic may be bypassed for up to 1 hour for Surveillances, provided the other channel is OPERABLE. --------------------	
		Restore inoperable channel to OPERABLE status.	48 hours
E. Required Action and associated Completion Time of Conditions for Containment Spray Actuation Signal, Main Steam Isolation Signal or Auxiliary Feedwater Actuation Signal not met.	E.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	E.2	Be in MODE 4.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. Required Action and associated Completion Time of Conditions for Safety Injection Actuation Signal, Containment Isolation Actuation Signal, or Recirculation Actuation Signal not met.	F.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	F.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	------------------NOTE------------------ Testing of Actuation Logic shall include the verification of the proper operation of each initiation relay. --- Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel and Manual Trip channel.	92 days
SR 3.3.6.2	------------------NOTE------------------ Relays exempt from testing during operation shall be tested each 18 months. --- Perform a subgroup relay test of each Actuation Logic channel, which includes the de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay.	9 months on a STAGGERED TEST BASIS

Table 3.3.6-1 (page 1 of 1)
Engineered Safety Features Actuation System Logic and Manual Trip Applicability

FUNCTION	APPLICABLE MODES
1. Safety Injection Actuation Signal	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3,4
c. Actuation Logic	1,2,3,4
d. Manual Trip	1,2,3,4
2. Containment Isolation Actuation Signal	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3,4
c. Actuation Logic	1,2,3,4
d. Manual Trip	1,2,3,4
3. Recirculation Actuation Signal	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3,4
c. Actuation Logic	1,2,3,4
d. Manual Trip	1,2,3,4
4. Containment Spray Actuation Signal	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3
c. Actuation Logic	1,2,3
d. Manual Trip	1,2,3
5. Main Steam Isolation Signal[a]	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3
c. Actuation Logic	1,2,3
d. Manual Trip	1,2,3
6. Auxiliary Feedwater Actuation Signal SG #1 (AFAS-1)	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3
c. Actuation Logic	1,2,3
d. Manual Trip	1,2,3
7. Auxiliary Feedwater Actuation Signal SG #2 (AFAS-2)	
a. Matrix Logic	1,2,3
b. Initiation Logic	1,2,3
c. Actuation Logic	1,2,3
d. Manual Trip	1,2,3

(a) The MSIS Function is not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed.

3.3 INSTRUMENTATION

3.3.7 Diesel Generator (DG) – Loss of Voltage Start (LOVS)

LCO 3.3.7 Four channels of Loss of Voltage Function and Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LOVS channel per DG inoperable.	A.1 Place channel in bypass or trip. AND A.2 Restore channel to OPERABLE status.	1 hour Prior to entering MODE 2 following next MODE 5 entry

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two LOVS channels per DG inoperable.	B.1	Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG – LOVS instrumentation.	1 hour
	<u>OR</u>		
	B.2	--------NOTE--------- LCO 3.0.4 is not applicable. --------------------	
		Place one channel in bypass and the other channel in trip.	1 hour
C. More than two LOVS channels per DG inoperable.	C.1	Restore all but two channels to OPERABLE status.	1 hour
D. Required Action and associated Completion Time not met.	D.1	Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG – LOVS instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2	Perform CHANNEL FUNCTIONAL TEST.	18 months
SR 3.3.7.3	Perform CHANNEL CALIBRATION with setpoint Allowable Values as follows: a. Degraded Voltage Function ≥ 3697 V and ≤ 3786 V Time delay: ≤ 35 seconds at 3744 V; and b. Loss of Voltage Function ≥ 3250 V Time delay: ≤ 11.4 seconds at 2929.5 V.	18 months

3.3 INSTRUMENTATION

3.3.8 Containment Purge Isolation Actuation Signal (CPIAS)

LCO 3.3.8 One CPIAS channel shall be OPERABLE.

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

--------------------------NOTE--------------------------
Only required when the penetration is not isolated by at least one closed automatic valve, closed manual valve, or blind flange.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CPIAS Manual Trip, Actuation Logic, or radiation monitor inoperable in MODES 1, 2, 3, and 4.	A.1	Place and maintain containment purge and exhaust valves in closed position.	Immediately
B. Required Action and associated Completion Time not met.	B.1	Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3 "Containment Isolation Valves" made inoperable by CPIAS instrumentation.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. CPIAS Manual Trip, Actuation Logic, or radiation monitor inoperable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment.	C.1 Place and maintain containment purge and exhaust valves in closed position.	Immediately
	OR	
	C.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.2.2 Suspend movement of irradiated fuel assemblies in containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform a CHANNEL CHECK on required radiation monitor channel.	12 hours
SR 3.3.8.2	Perform a CHANNEL FUNCTIONAL TEST on each required radiation monitor channel, and Verify the setpoint ≤ 2.5 mR/hr.	92 days
SR 3.3.8.3	-------------------NOTE------------------- Surveillance of Actuation Logic shall include the verification of the proper operation of each actuation relay. -- Perform a CHANNEL FUNCTIONAL TEST on required CPIAS Actuation Logic channel.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.4	Perform a CHANNEL CALIBRATION on required radiation monitor channel.	18 months
SR 3.3.8.5	Perform CHANNEL FUNCTIONAL TEST on required CPIAS Manual Trip channel.	18 months

3.3 INSTRUMENTATION

3.3.9 Control Room Essential Filtration Actuation Signal (CREFAS)

LCO 3.3.9 One CREFAS channel shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CREFAS Manual Trip, Actuation Logic, or radiation monitor inoperable in MODE 1, 2, 3, or 4.	A.1 Place one CREFS train in operation.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. CREFAS Manual Trip, Actuation Logic, or radiation monitor inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1 Place one CREFS train in operation.	Immediately
	<u>OR</u>	
	C.2.1 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	C.2.2 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	C.2.3 Suspend CORE ALTERATIONS.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform a CHANNEL CHECK on the required control room radiation monitor channel.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.9.2	Perform a CHANNEL FUNCTIONAL TEST on required CREFAS radiation monitor channel. Verify CREFAS high radiation setpoint is $\leq 2 \times 10^{-5}$ μCi/cc.	92 days
SR 3.3.9.3	-------------------NOTES----------------- 1. Surveillance of Actuation Logic shall include the verification of the proper operation of each Actuation relay. 2. Relays associated with plant equipment that cannot be operated during plant operation are required to be tested during each MODE 5 entry exceeding 24 hours unless tested within the previous 6 months. --- Perform a CHANNEL FUNCTIONAL TEST on required CREFAS Actuation Logic channel.	18 months
SR 3.3.9.4	Perform a CHANNEL CALIBRATION on required CREFAS radiation monitor channel.	18 months
SR 3.3.9.5	Perform a CHANNEL FUNCTIONAL TEST on required CREFAS Manual Trip channel.	18 months
SR 3.3.9.6	Verify that response time of required CREFAS channel is within limits.	18 months on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.10 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.10 The PAM instrumentation for each Function in Table 3.3.10-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

------------------------------------NOTES------------------------------------
1. LCO 3.0.4 not applicable.

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.6.	Immediately
C. ---------NOTE--------- Not applicable to hydrogen monitor channels. -------------------- One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two hydrogen monitor channels inoperable.	D.1 Restore one hydrogen monitor channel to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Enter the Condition referenced in Table 3.3.10-1 for the channel.	Immediately
F. As required by Required Action E.1 and referenced in Table 3.3.10-1.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	6 hours 12 hours
G. As required by Required Action E.1 and referenced in Table 3.3.10-1.	G.1 Initiate action in accordance with Specification 5.6.6.	Immediately

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
These SRs apply to each PAM instrumentation Function in Table 3.3.10-1.

SURVEILLANCE		FREQUENCY
SR 3.3.10.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.10.2	------------------NOTE------------------ Neutron detectors are excluded from the CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	18 months

Table 3.3.10-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION E.1
1.	Logarithmic Neutron Flux	2	F
2.	Reactor Coolant System Hot Leg Temperature	2 per loop	F
3.	Reactor Coolant System Cold Leg Temperature	2 per loop	F
4.	Reactor Coolant System Pressure (wide range)	2	F
5.	Reactor Vessel Water Level	2(d)	G
6.	Containment Sump Water Level (wide range)	2	F
7.	Containment Pressure (wide range)	2	F
8.	Containment Isolation Valve Position	2 per penetration flow path(a)(b)	F
9.	Containment Area Radiation (high range)	2	G
10.	Containment Hydrogen Monitors	2	F
11.	Pressurizer Level	2	F
12.	Steam Generator Water Level (wide range)	2 per steam generator	F
13.	Condensate Storage Tank Level	2	F
14.	Core Exit Temperature – Quadrant 1	2(c)	F
15.	Core Exit Temperature – Quadrant 2	2(c)	F
16.	Core Exit Temperature – Quadrant 3	2(c)	F
17.	Core Exit Temperature – Quadrant 4	2(c)	F
18.	Steam Generator Pressure	2 per steam generator	F
19.	Reactor Coolant System Subcooling Margin Monitoring	2	F
20.	Reactor Coolant System Activity	2	G

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

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) A channel consists of two or more core exit thermocouples.

(d) A channel is eight sensors in a probe. A channel is OPERABLE if four or more sensors, two or more in the upper four and two or more in the lower four, are OPERABLE.

3.3 INSTRUMENTATION

3.3.11 Remote Shutdown System

LCO 3.3.11 The Remote Shutdown System Instrumentation Functions in Table 3.3.11-1 and each Remote Shutdown System disconnect switch and control circuit shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

1. LCO 3.0.4 is not applicable.

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions in Table 3.3.11.1 inoperable.	A.1 Restore required Functions to OPERABLE status.	30 days
B. One or more remote shutdown system disconnect switches or control circuits inoperable.	B.1 Restore required switch(s)/circuit(s) to OPERABLE status	30 days
	<u>OR</u>	
	B.2 Issue procedure changes that identify alternate disconnect methods or control circuits	30 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.11.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.11.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	18 months
SR 3.3.11.3	-------------------NOTE-------------------- Neutron detectors are excluded from the CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	18 months

Table 3.3.11-1 (page 1 of 1)
Remote Shutdown System Instrumentation and Controls

FUNCTION/INSTRUMENT	REQUIRED NUMBER OF CHANNELS
1. Reactivity Control	
a. Log Power Neutron Flux	2
2. Reactor Coolant System Pressure Control	
a. Pressurizer Pressure	1
b. Refueling Water Tank Level	2
c. Charging Line Pressure	1
d. Charging Line Flow	1
3. Decay Heat Removal (via Steam Generators)	
a. Reactor Coolant Hot Leg Temperature	1 per loop
b. Reactor Coolant Cold Leg Temperature	1 per loop
c. Steam Generator Pressure	2 per steam generator
d. Steam Generator Level	2 per steam generator
e. Auxiliary Feedwater Flow	2 per steam generator
4. Decay Heat Removal (via Shutdown Cooling System)	
a. Shutdown Cooling Heat Exchanger Temperature	2
b. Shutdown Cooling Flow	2
5. Reactor Coolant System Inventory Control	
a. Pressurizer Level	2

3.3 INSTRUMENTATION

3.3.12 Boron Dilution Alarm System (BDAS)

LCO 3.3.12 Two channels of BDAS shall be OPERABLE.

APPLICABILITY: MODES 3, 4 and 5.

---------------------------NOTE---------------------------
Required in MODE 3 within 1 hour after the neutron flux is within the startup range following a reactor shutdown.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required channel inoperable.	A.1	Determine the RCS boron concentration.	Immediately <u>AND</u> At the monitoring Frequency specified in the CORE OPERATING LIMITS REPORT
B. Two required channels inoperable.	B.1	Determine the RCS boron concentration by redundant methods.	Immediately <u>AND</u> At the monitoring frequency specified in the CORE OPERATING LIMITS REPORT

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time not met.	C.1	Suspend all operations involving positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	---NOTE--- Not required to be performed until 1 hour after neutron flux is within the startup range. ------ Perform CHANNEL CHECK.	12 hours
SR 3.3.12.2	---NOTE--- Not required to be performed until 72 hours after neutron flux is within the startup range. ------ Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.12.3	---NOTE--- Neutron detectors are excluded from CHANNEL CALIBRATION. ------ Perform CHANNEL CALIBRATION.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

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

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

a. Pressurizer pressure ≥ 2130 psia and ≤ 2295 psia; and

b. RCS cold leg temperature (T_c) shall be within the area of acceptable operation shown in Figure 3.4.1-1; and

c. RCS total flow rate ≥ 155.8 E6 lbm/hour.

APPLICABILITY: MODE 1 for RCS total flow rate,

MODES 1 and 2 for pressurizer pressure,

MODE 1 for RCS cold leg temperature (Tc),

MODE 2 with K_{eff} ≥ 1 for RCS cold leg temperature (Tc).

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

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

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RCS flow rate not within limit.	A.1	Restore RCS flow rate to within limit.	2 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 2.	6 hours

(continued)

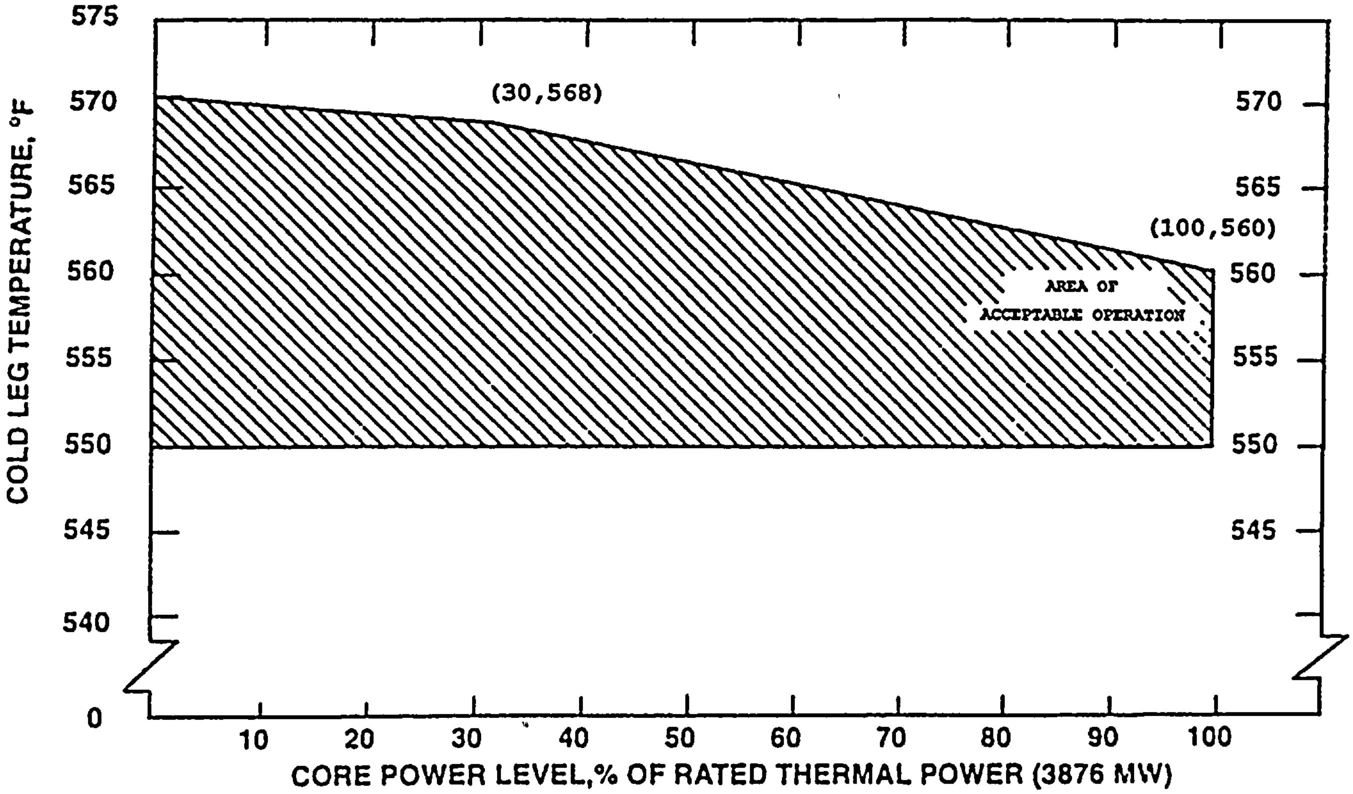
ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Pressurizer pressure or RCS cold leg temperature not within limits.	C.1 Restore parameter(s) to within limits.	2 hours
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure ≥ 2130 psia and ≤ 2295 psia.	12 hours
SR 3.4.1.2	Verify RCS cold leg temperature within limits as shown in Figure 3.4.1-1.	12 hours
SR 3.4.1.3	------------------NOTE------------------ Required to be met in MODE 1 with all RCPs running. -- Verify RCS total flow rate ≥ 155.8 E6 lbm/hour.	12 hours

Figure 3.4.1-1
Reactor Coolant Cold Leg Temperature vs. Core Power Level



REACTOR COOLANT COLD LEG TEMPERATURE vs. CORE POWER LEVEL

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS loop temperature (T_{cold}) shall be ≥ 545°F.

APPLICABILITY: MODE 1,
MODE 2 with K_{eff} ≥ 1.0.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 Verify RCS T_{cold} in each loop ≥ 545°F.	------NOTE----- Only required if any RCS loop T_{cold} < 550°F. --------------- 30 minutes AND Once within 30 minutes prior to reaching criticality

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 limited in accordance with the limits shown in Figures 3.4.3-1 or 3.4.3-2 during heatup, cooldown criticality, and inservice leak and hydrostatic testing with:

a. Maximum heatup and cooldown specified in Table 3.4.3-1.

b. A maximum temperature change of 10°F in any 1-hour period during inservice hydrostatic testing operations.

APPLICABILITY: At all times; except when reactor vessel head is fully detensioned such that the RCS cannot be pressurized.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Required Action A.2 shall be completed whenever this Condition is entered. --------------------- Requirements of LCO not met in MODE 1, 2, 3, or 4.	A.1 Restore parameter(s) to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5 with RCS pressure < 500 psia.	6 hours 36 hours

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	-----------------NOTE------------------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. --------------------------------------- Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates within limits specified in Table 3.4.3-1, and Figures 3.4.3-1 and 3.4.3-2.	30 minutes

TABLE 3.4.3-1
Maximum Allowable Heatup and Cooldown Rates

≤8 Effective Full Power Years

Heatup

T_c^x (°F)	Rate (°F/HR)
< 128°F	20°F/HR
128°F - 180°F	30°F/HR
181° - 230°F	50°F/HR
> 230°F	75°F/HR

Cooldown

T_c^x (°F)	Rate (°F/HR)
≤ 93°F	See Figure 3.4.3-3
94°F - 114°F	10°F/HR
115°F - 148°F	20°F/HR
> 148°F	100°F/HR

8-32 Effective Full Power Years

Heatup

T_c^x (°F)	Rate (°F/HR)
< 116°F	10°F/HR
117°F - 150°F	20°F/HR
151° - 199°F	30°F/HR
200°F - 246°F	50°F/HR
> 246°F	75°F

Cooldown

T_c^x (°F)	Rate (°F/HR)
≤ 108°F	See Figure 3.4.3-4
109° - 126°F	10°F/HR
127°F - 147°F	20°F/HR
148°F - 162°F	40°F/HR
>162°F	100°F/HR

^{x} Indicated Cold Leg Temperature

Figure 3.4.3-1
Reactor Coolant System Pressure/Temperature
Limitations for Less Than 8 Effective
Full Power Years of Operation

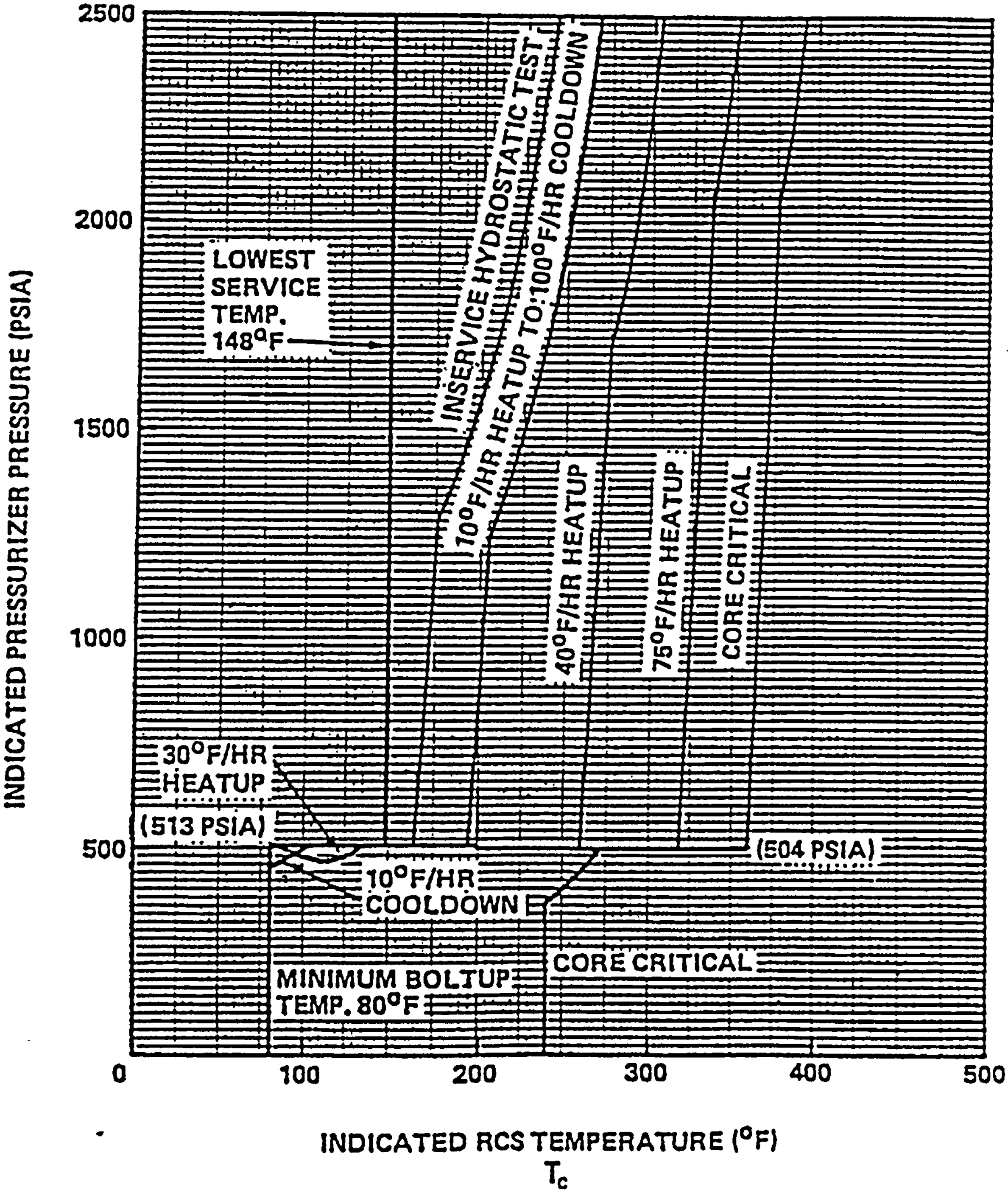


Figure 3.4.3-2
Reactor Coolant System Pressure/Temperature
Limitations for 8 to 32 Effective Full
Power Years of Operation

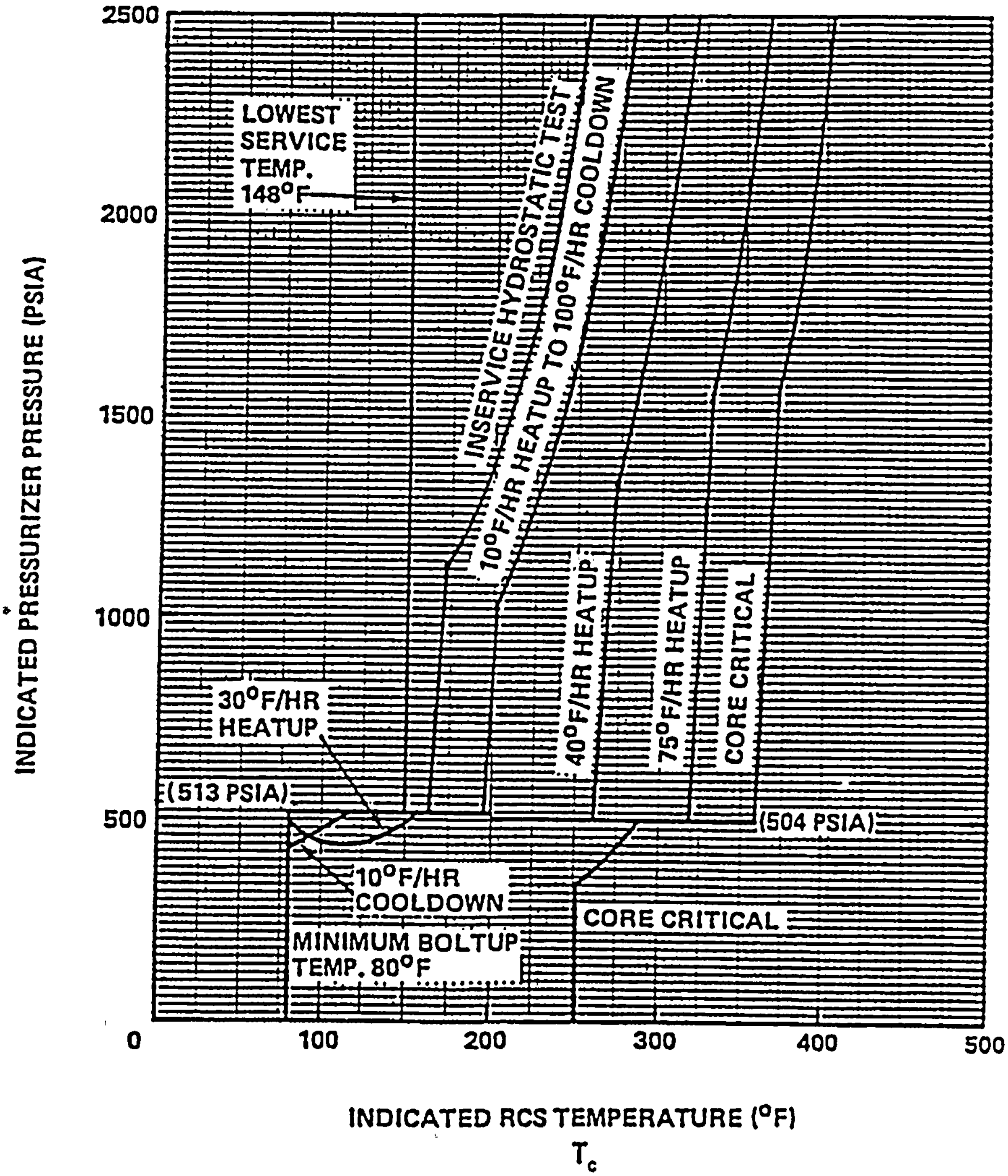


Figure 3.4.3-3
Maximum Allowable Cooldown Rates
< 8 EFPY

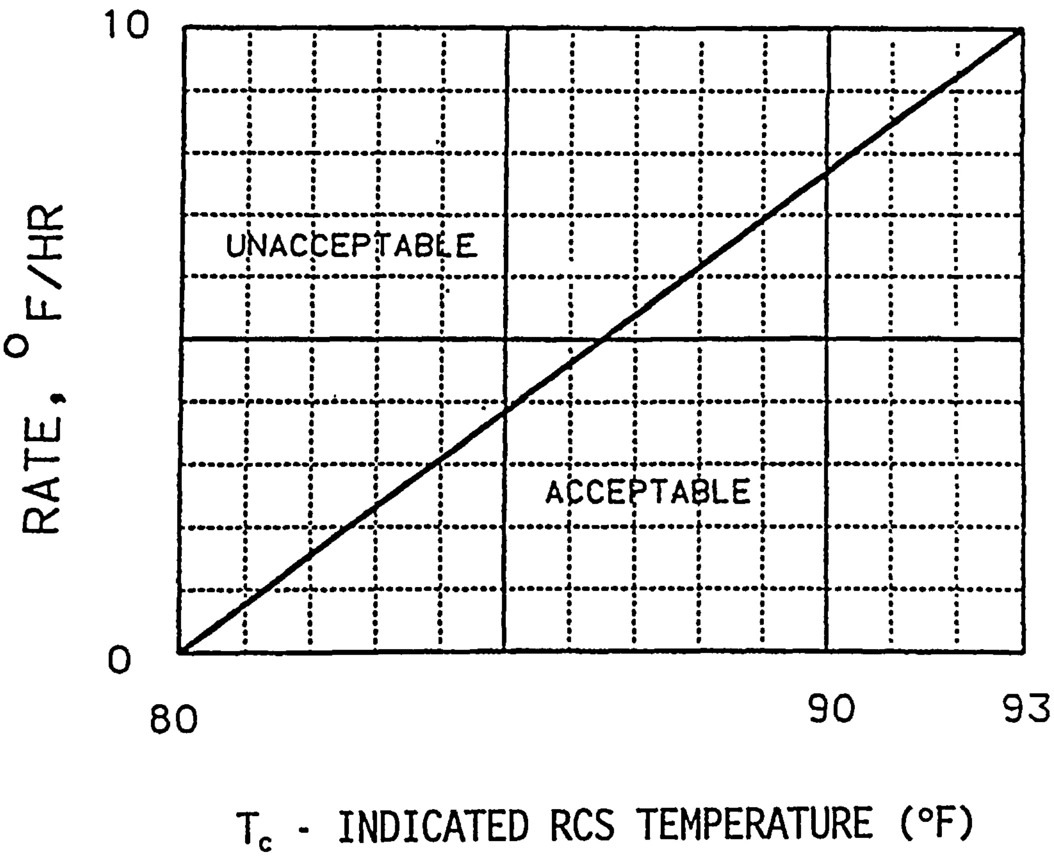
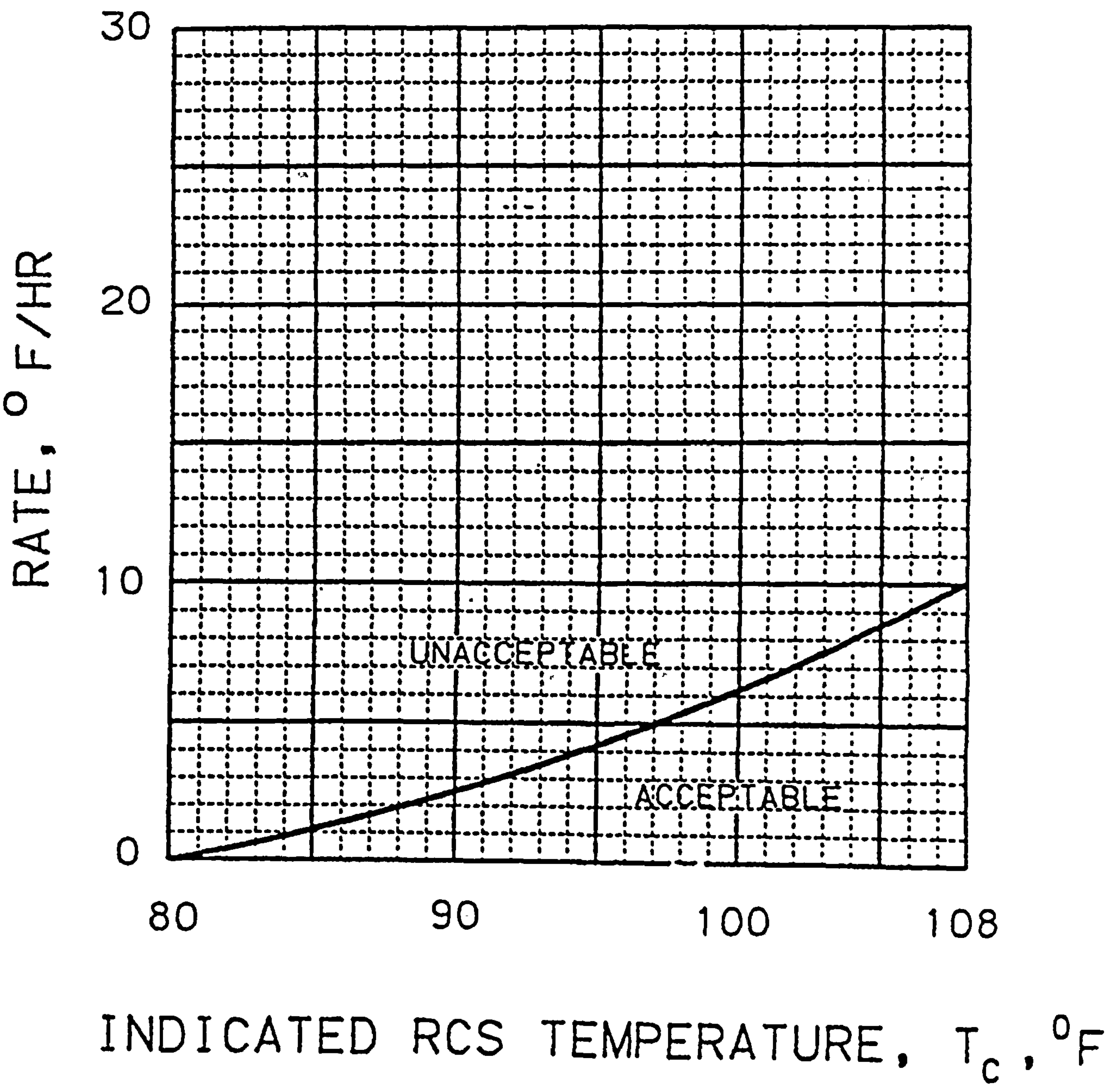


Figure 3.4.3-4
Maximum Allowable Cooldown Rates
8 - 32 EFPY



3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops – MODES 1 and 2

LCO 3.4.4 Two RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops — MODE 3

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

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

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

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

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

APPLICABILITY: MODE 3.

ACTIONS

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

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loop is in operation.	12 hours
SR 3.4.5.2	Verify secondary side water level in each steam generator ≥ 25%.	12 hours
SR 3.4.5.3	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops – MODE 4

LCO 3.4.6 Two loops or trains consisting of any combination of RCS loops and shutdown cooling (SDC) trains shall be OPERABLE and at least one loop or train shall be in operation.

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

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

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

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

2. No RCP shall be started with any RCS cold leg temperature ≤ 214°F during cooldown, or ≤ 291°F during heatup, unless the secondary side water temperature in each Steam Generator (SG) is < 100°F above each of the RCS cold leg temperatures.

3. No more than 2 RCPs may be in operation with RCS cold leg temperature ≤ 200°F. No more than 3 RCPs may be in operation with RCS cold leg temperature > 200°F but ≤ 500°F.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RCS loop inoperable. AND Two SDC trains inoperable.	A.1 Initiate action to restore a second loop or train to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required SDC train inoperable. AND Two required RCS loops inoperable.	B.1 Be in MODE 5.	24 hours
C. No RCS loop or SDC train OPERABLE. OR No RCS loop or SDC train in operation.	C.1 Suspend all operations involving reduction of RCS boron concentration. AND C.2 Initiate action to restore one loop or train to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RCS loop or SDC train is in operation.	12 hours
SR 3.4.6.2	Verify secondary side water level in required SG(s) is ≥ 25%.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops — MODE 5, Loops Filled

LCO 3.4.7 One Shutdown Cooling (SDC) train shall be OPERABLE and in operation, and either:

a. One additional SDC train shall be OPERABLE; or

b. The secondary side water level of each Steam Generator (SG) shall be ≥ 25%.

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

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

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

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

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

3. No Reactor Coolant Pump (RCP) shall be started with one or more of the RCS cold leg temperatures ≤ 214°F during cooldown, or ≤ 291°F during heatup unless the secondary side water temperature in each SG is < 100°F above each of the RCS cold leg temperatures.

4. No more than 2 RCPs may be in operation with RCS cold leg temperature ≤ 200°F. No more than 3 RCPs may be in operation with RCS cold leg temperature > 200°F but ≤ 500°F.

5. All SDC trains may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One SDC train inoperable. AND Any SG with secondary side water level not within limit.	A.1	Initiate action to restore a second SDC train to OPERABLE status.	Immediately
	OR		
	A.2	Initiate action to restore SG secondary side water levels to within limits.	Immediately
B. Required SDC train inoperable. OR No SDC train in operation.	B.1	Suspend all operations involving reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore one SDC train to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one SDC train is in operation.	12 hours
SR 3.4.7.2	Verify required SG secondary side water level is ≥ 25%.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required SDC pump that is not in operation.	7 days

3:4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops — MODE 5, Loops Not Filled

LCO 3.4.8 Two Shutdown Cooling (SDC) trains shall be OPERABLE and one SDC train shall be in operation.

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

1. All SDC pumps may be de-energized for ≤ 1 hour per 8 hour period:
   a. The core outlet temperature is maintained > 10°F below saturation temperature;
   b. No operations are permitted that would cause a reduction of the RCS boron concentration; and
   c. No draining operations to further reduce the RCS water volume are permitted.
2. One SDC train may be inoperable for ≤ 2 hours for surveillance testing provided the other SDC train is OPERABLE and in operation.

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC train inoperable.	A.1 Initiate action to restore SDC train to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required SDC trains inoperable. OR No SDC train in operation.	B.1 Suspend all operations involving reduction of RCS boron concentration.	Immediately
	AND	
	B.2 Initiate action to restore one SDC train to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one SDC train is in operation.	12 hours
SR 3.4.8.2	Verify correct breaker alignment and indicated power available to the required SDC pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

a. Pressurizer water level ≥ 27% and ≤ 56%; and

b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 125 kW and capable of being powered from an emergency power supply.

APPLICABILITY: MODES 1, 2, and 3.

---------------------------NOTE---------------------------
The pressurizer water level limit does not apply during:

a. THERMAL POWER ramp > 5% RTP per minute; or
b. THERMAL POWER step > 10% RTP.

ACTIONS

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	C.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≥ 27% and ≤ 56%.	12 hours
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters ≥ 125 kW.	92 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves - Modes 1, 2 and 3

LCO 3.4.10 Four pressurizer safety valves shall be OPERABLE with lift settings ≥ 2450.25 psia and ≤ 2549.25 psia.

APPLICABILITY: MODES 1, 2, and 3.

----------------------------NOTE----------------------------
The lift settings are not required to be within LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 72 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. OR Two or more pressurizer safety valves inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Safety Valves-MODE 4

LCO 3.4.11 One pressurizer safety valve shall be OPERABLE with a lift setting ≥ 2450.25 psia and ≤ 2549.25 psia.

APPLICABILITY: MODE 4 with all RCS cold leg temperatures > 214°F during cooldown, or

MODE 4 with all RCS cold leg temperatures > 291°F during heatup.

---------------------------NOTE---------------------------
The lift settings are not required to be within LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 72 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. All pressurizer safety valves inoperable.	A.1	Be in MODE 4 with one Shutdown Cooling System suction line relief valve in service.	Immediately
	<u>AND</u>		
	A.2	Perform SR 3.4.11.2 and SR 3.4.11.3 for the required Shutdown Cooling System suction line relief valve to comply with Action A.1.	Immediately
	<u>AND</u>		
	A.3	Be in MODE 4 with any RCS cold leg temperatures ≤ 214°F during cooldown or ≤ 291°F during heatup.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify the required pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within ± 1%.	In accordance with the Inservice Testing Program
SR 3.4.11.2	--------------------NOTE------------------- Only required to be performed when a Shutdown Cooling System suction line relief valve is being used for overpressure protection. -- Verify the required Shutdown Cooling System suction line relief valve is aligned to provide overpressure protection for the RCS.	12 hours for unlocked, not sealed, or otherwise not secured open pathway vent valve(s) AND 31 days for locked, sealed, or otherwise secured open pathway vent valve(s)
SR 3.4.11.3	Verify the required Shutdown Cooling System suction line relief valve is OPERABLE with the required setpoint.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Pressurizer Vents

LCO 3.4.12 Four pressurizer vent paths shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.
MODE 4 with RCS pressure ≥ 385 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two or three required pressurizer vent paths inoperable.	A.1 Restore required pressurizer vent paths to OPERABLE status.	72 hours
B. All pressurizer vent paths inoperable.	B.1 Restore one pressurizer vent path to OPERABLE status.	6 hours
C. Required Action and associated Completion Time of Condition A, or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4 with RCS pressure < 385 psia.	6 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Perform a complete cycle of each Pressurizer Vent Valve.	18 months
SR 3.4.12.2	Verify flow through each pressurizer vent path.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.13 An LTOP System shall be OPERABLE consisting of:

a. Two OPERABLE Shutdown Cooling System suction line relief valves with lift settings ≤ 467 psig aligned to provide overpressure protection for the RCS; or

b. The RCS depressurized and an RCS vent of ≥ 16 square inches.

---------------------------NOTE---------------------------
No RCP shall be started unless the secondary side water temperature in each steam generator (SG) is ≤ 100°F above each of the RCS cold leg temperatures.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ 214°F during cooldown,
MODE 4 when any RCS cold leg temperature is ≤ 291°F during heatup,
MODE 5,
MODE 6 when the reactor vessel head is on.

---------------------------NOTE---------------------------
When one or more cold legs reach 214°F, this LCO remains applicable during periods of steady state temperature conditions until all RCS cold leg temperature reach 291°F. If a cooldown is terminated prior to reaching 214°F and a heatup is commenced, this LCO is applicable until all RCS cold leg temperatures reach 291°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required Shutdown Cooling System suction line relief valve inoperable in MODE 4.	------------NOTE------------ LCO 3.0.4 is not applicable ---------------------------- A.1 Restore required Shutdown Cooling System suction line relief valve to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required Shutdown Cooling System suction line relief valve inoperable in MODE 5 or 6.	B.1	Restore required Shutdown Cooling System suction line relief valve to OPERABLE status.	24 hours
C. Two required Shutdown Cooling System suction line relief valves inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A, or B not met.	C.1	Depressurize RCS and establish RCS vent of ≥ 16 square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	Verify RCS Vent ≥ 16 square inches is open.	12 hours for unlocked, not sealed, or otherwise not secured open vent pathway(s) AND 31 days for locked, sealed, or otherwise secured open vent pathway(s)
SR 3.4.13.2	Verify each Shutdown Cooling System suction line relief valve is aligned to provide overpressure protection for the RCS.	12 hours for unlocked, not sealed, or otherwise not secured open pathway vent valve(s) AND 31 days for locked, sealed, or otherwise secured open pathway vent valve(s).
SR 3.4.13.3	Verify each Shutdown Cooling System suction line relief valve is OPERABLE with the required setpoint.	In accordance with the Inservice Testing Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 RCS Operational LEAKAGE

LCO 3.4.14 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 1 gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE;

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

e. 720 gallons per day primary to secondary LEAKAGE through any one SG.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. OR Pressure boundary LEAKAGE exists.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
C. One or more SGs inoperable.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.14.1	------------------NOTE------------------- Not required to be performed in MODE 3 or 4 until 12 hours of steady state operation. -- Perform RCS water inventory balance.	-----NOTE------ Only required to be performed during steady state operation -------------- 72 hours
SR 3.4.14.2	Verify SG tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	In accordance with the Steam Generator Tube Surveillance Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Pressure Isolation Valve (PIV) Leakage

LCO 3.4.15 Leakage from each RCS PIV shall be within limits.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4, except valves in the shutdown cooling (SDC) flow path when in, or during the transition to or from, the SDC mode of operation.

ACTIONS

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

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

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with leakage from one or more RCS PIVs not within limit	------------NOTE------------ Each valve used to satisfy Required Action A.1 and required Action A.2 must have been verified to meet SR 3.4.15.1 and be on the RCS pressure boundary. ---------------------------	
	A.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of one closed manual, deactivated automatic, or check valve.	4 hours
	AND	
	A.2 Restore RCS PIV to within limits	72 hours

(continued)

ACTIONS (Continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	-------------------NOTES------------------- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the SDC flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. ---	
	Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2230 psia and ≤ 2270 psia.	18 months AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months, except for SDC PIVs AND (continued)

SURVEILLANCE REQUIREMENTS (Continued)

SURVEILLANCE		FREQUENCY
SR 3.4.15.1 (continued)		Within 24 hours following valve actuation due to automatic or manual action or flow through the valve, except for SDC PIVs.
SR 3.4.15.2	Verify SDC System open permissive interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 410 psia.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Leakage Detection Instrumentation

LCO 3.4.16 Both of the following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor; and

b. One containment atmosphere radioactivity monitor (gaseous and particulate).

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required containment sump monitor inoperable.	------------NOTE------------ LCO 3.0.4 is not applicable. ---------------------------	
	A.1 Perform SR 3.4.14.1.	Once per 24 hours
	<u>AND</u>	
	A.2 Restore containment sump monitor to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	------------NOTE------------ LCO 3.0.4 is not applicable. ------------------------------	
	B.1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	OR	
	B.1.2 Perform SR 3.4.14.1.	Once per 24 hours
	AND	
	B.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	30 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	AND	
	C.2 Be in MODE 5.	36 hours
D. All required monitors inoperable.	D.1 Enter LCO 3.0.3	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	12 hours
SR 3.4.16.2	Perform CHANNEL FUNCTIONAL TEST of the required containment atmosphere radioactivity monitor.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.16.3	Perform CHANNEL CALIBRATION of the required containment sump monitor.	18 months
SR 3.4.16.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 RCS Specific Activity

LCO 3.4.17 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS cold leg temperature (T_{cold}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 1.0 μCi/gm.	----------NOTE---------- LCO 3.0.4 is not applicable. -------------------------	
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.17-1.	Once per 4 hours
	<u>AND</u>	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.17-1.	B.1 Be in MODE 3 with T_{cold} < 500°F.	6 hours
C. Gross specific activity of the reactor coolant not within limit.	C.1 Perform SR 3.4.17.2. AND C.2 Be in MODE 3 with T_{cold} < 500°F.	4 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.17.1 Verify reactor coolant gross specific activity ≤ 100/Ē μCi/gm.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.17.2	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity $\leq$ 1.0 μCi/gm.	-------NOTE------ Only required to be performed in MODE 1. ---------------- 14 days AND Between 2 and 6 hours after THERMAL POWER change of $\geq$ 15% RTP within a 1 hour period
SR 3.4.17.3	------------------NOTE--------------- Not required to be performed until 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for $\geq$ 48 hours. ------------------------------------ Determine $\bar{E}$ from a sample taken in MODE 1 after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for $\geq$ 48 hours.	184 days

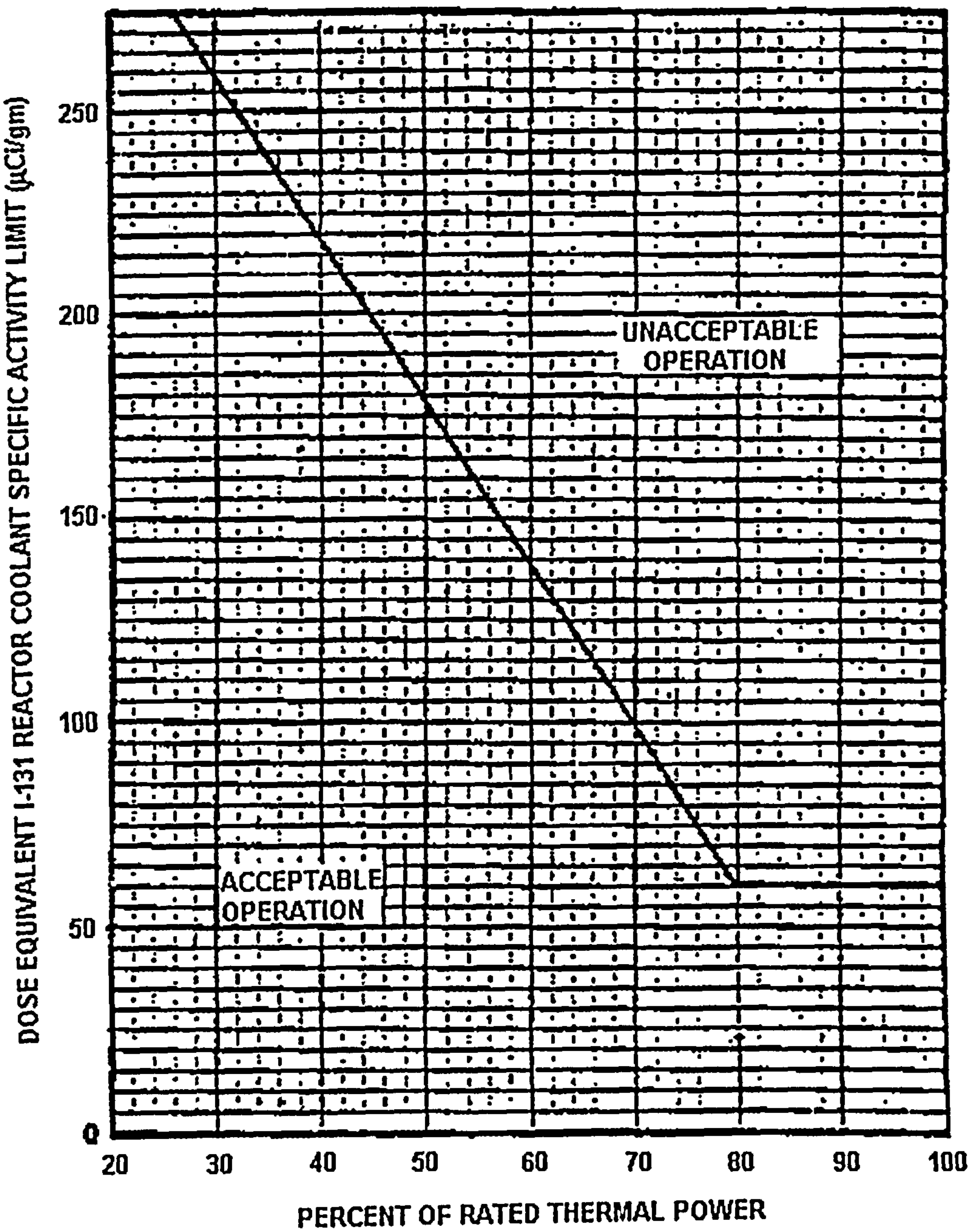


Figure 3.4.17-1 (page 1 of 1)
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity Limit Versus Percent of RATED THERMAL POWER With Reactor Coolant Specific Activity > 1.0 µCi/gm DOSE EQUIVALENT I-131

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Safety Injection Tanks (SITs) - Operating

LCO 3.5.1 Four SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3 and 4 with pressurizer pressure ≥ 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SIT inoperable due to boron concentration not within limits.	A.1 Restore SIT to OPERABLE status.	72 hours
B. One SIT inoperable for reasons other than Condition A.	B.1 Restore SIT to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Reduce pressurizer pressure to < 1837 psia.	6 hours 12 hours
D. Two or more SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each SIT isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each SIT is ≥ 28% narrow range and ≤ 72% narrow range.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each SIT is ≥ 600 psig and ≤ 625 psig.	12 hours
SR 3.5.1.4	Verify boron concentration in each SIT is ≥ 2300 ppm and ≤ 4400 ppm.	31 days AND -----NOTE------ Only required to be performed for affected SIT --------------- Once within 6 hours, whenever a SIT is drained to maintain the contained borated water level within the limits of SR 3.5.1.2.
SR 3.5.1.5	Verify power is removed from each SIT isolation valve operator.	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 Safety Injection Tanks (SITs)-Shutdown

LCO 3.5.2 Four SITs shall be OPERABLE with a borated water volume > 39% wide range indication and < 83% wide range indication;

<u>OR</u>

Three SITS shall be OPERABLE with a borated water volume > 60% wide range indication and < 83% wide range indication.

APPLICABILITY: MODES 3 and 4 with pressurizer pressure < 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SIT inoperable due to boron concentration not within limits.	A.1 Restore required SIT to OPERABLE status.	72 hours
B. One required SIT inoperable for reasons other than Condition A.	B.1 Restore required SIT to OPERABLE status.	1 hour
C. Inoperability of the required SIT was discovered but not restored while in ITS 3.5.1, "SITs-Operating" <u>OR</u> Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 5.	24 hours
D. Two or more required SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each required SIT isolation valve is fully open when pressurizer pressure is ≥ 430 psia.	12 hours
SR 3.5.2.2	Verify borated water volume in each required SIT is: a. For four OPERABLE SITs, > 39% wide range indication and < 83% wide range indication. OR b. For three OPERABLE SITs, > 60% wide range indication and < 83% wide range indication.	12 hours
SR 3.5.2.3	Verify nitrogen cover pressure in each required SIT is ≥ 260 psig and ≤ 625 psig.	12 hours
SR 3.5.2.4	Verify boron concentration in each required SIT is ≥ 2300 ppm and ≤ 4400 ppm.	31 days AND -----NOTE------ Only required to be performed for affected SIT -------------- Once within 6 hours, whenever a required SIT is drained to maintain the contained borated water level within the limits of SR 3.5.2.2.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify power is removed from each required SIT isolation valve operator when pressurizer pressure is ≥ 1500 psia.	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS – Operating

LCO 3.5.3 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.
MODE 3 with pressurizer pressure ≥ 1837 psia or with RCS T_c ≥ 485°F.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One LPSI subsystem inoperable.	A.1	Restore subsystem to OPERABLE status.	72 hours
B. One or more trains inoperable for reasons other than Condition A. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1	Restore train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Reduce pressurizer pressure to < 1837 psia.	12 hours
	AND		
	C.3	Reduce RCS T_c to < 485°F.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.3.2	Verify ECCS piping is full of water.	31 days
SR 3.5.3.3	Verify each ECCS pump develops the required differential pressure at the flow test point.	In accordance with the Inservice Testing Program
SR 3.5.3.4	Verify each ECCS automatic valve that is not locked, sealed, or otherwise secured in position, in the flow path actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.5.3.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.5.3.6	Verify each LPSI pump stops on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.7	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position. LPSI System Valve Number: SIB-UV 615, SIB-UV 625, SIA-UV 635, SIA-UV 645, SIA-HV 306, SIB-HV 307 Hot Leg Injection Valve Numbers: SIC-HV 321, SID-HV 331	18 months
SR 3.5.3.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 ECCS – Shutdown

LCO 3.5.4 One High Pressure Safety Injection (HPSI) train shall be OPERABLE.

APPLICABILITY: MODE 3 with pressurizer pressure < 1837 psia and with RCS T_c < 485°F,
MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Required HPSI train inoperable.	A.1	Restore required HPSI train to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	The following SRs are applicable: SR 3.5.3.1 SR 3.5.3.5 SR 3.5.3.2 SR 3.5.3.7 SR 3.5.3.3 SR 3.5.3.8 SR 3.5.3.4	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Refueling Water Tank (RWT)

LCO 3.5.5 The RWT shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWT boron concentration not within limits. OR RWT borated water temperature not within limits.	A.1 Restore RWT to OPERABLE status.	8 hours
B. RWT inoperable for reasons other than Condition A.	B.1 Restore RWT to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours