ITS

A1

3.1.2 Heatup and Cooldown

3.1.2.1 The reactor coolant pressure and the system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figure 3.1-1 and Figure 3.1-2 (for vessel exposure up to 24 EFPY). These limitations are as follows:

a. Over the temperature range from cold shutdown to hot operating conditions, the heatup rate shall not exceed 60°F/hr. in any one hour.

See 3.4.3

b. Allowable combinations of pressure and temperature for a specific cooldown rate are below and to the right of the limit lines for that rate as shown on Figure 3.1-2. This rate shall not exceed 100°F/hr. in any one hour. The limit lines for cooling rates between those shown in Figure 3.1-2 may be obtained by interpolation.

c. Primary system hydrostatic leak tests may be performed as necessary, provided the temperature limitation as noted on Figure 3.1-1 is not violated. Maximum hydrostatic test pressure should remain below 2350 psia.

[LCO 3.4.12.a.1] d. The overpressure protection system shall be OPERABLE[1], with both power operated relief valves OPERABLE with a lift setting of less than or equal to 420 psi whenever any RCS

9

M35

400 psig and an allowable value of ≤ 418

[1] The overpressure protection system shall not be considered inoperable solely because either the normal or emergency power source for the PORV block valves is inoperable.

A8

Supplement 3

A1

[LCO 3.4.12.a.1] cold leg temperature is less than or equal to 350°F and when the head is on the reactor vessel and the RCS is not vented to the containment.

[ACTION E] 1. With one PORV inoperable and T_{avg} greater than 200°F and any RCS cold leg temperature less than 350°F:

A. Restore the inoperable PORV to OPERABLE status within 7 days; or

[ACTION G] B. Depressurize and vent the RCS to the CV within the next ~~12~~ 8 hours.

[ACTION F] 2. With one PORV inoperable and T_{avg} less than or equal to 200°F:

A. Restore the inoperable PORV to OPERABLE status within 24 hours; or

[ACTION G] B. Complete depressurization and venting of the RCS to the CV within an additional ~~12~~ 8 hours.

[ACTION G] 3. With both PORVs inoperable, complete depressurization and venting of the RCS to the CV within ~~12~~ 8 hours. M24

[SR 3.4.12.4] [NOTE] 4. With the RCS vented per 1, 2, or 3, verify the vent pathway:

A. At least once per 31 days when the pathway is provided by a valve(s) that is locked, sealed, or otherwise secured in the open position; or

B. At least once per ~~shift~~ 12 hours.

Add LCO 3.4.12.b
Add Applicability NOTE
ACTIONS A, B, C, D
SR [illegible]
SR [illegible]
SR 3.4.12.3

M25

A23

Add LCO 3.4.12.d

Add LCO 3.4.12.a.2 M37

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Specification 3.4.12

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A1

3.3.1.3 When the reactor is in the hot shutdown condition, the requirements of 3.3.1.1 and 3.3.1.2 shall be met. Except that the accumulators may be isolated or otherwise inoperable relative to the requirements of 3.3.1.1.b. In addition, any one component as defined in 3.3.1.2 may be inoperable for a period equal to the time period specified in the subparagraphs of 3.3.1.2 plus 48 hours, after which the plant shall be placed in the cold shutdown condition utilizing normal operating procedures. The safety injection pump power supply breakers must be racked out when the reactor coolant system temperature is below 350°F and the system is not vented to containment atmosphere.

See 3.5.1, 3.5.2, 3.5.3 & 3.5.4

All but one

L8

with the RCS temperature ≥175°

[LCO 3.4.12.c]

3.3.1.4 When the reactor is in the cold shutdown condition (except refueling operation when Specification 3.8.1.e applies), both residual heat removal loops must be operable. Except that either the normal or emergency power source to both residual heat removal loops may be inoperable.

M26

MODE 4, 5, & 6

3.4.7
3.4.8

a. If one residual heat removal loop becomes inoperable during cold shutdown operation, within 24 hours verify the existence of a method to add make-up water to the reactor coolant system such as charging pumps, safety injection pumps (under adequate operator control to prevent system overpressurization), or primary water (if the reactor coolant system is open for maintenance) as back-up decay heat removal method. Restore the inoperable RHR loop to operable status within 14 days or prepare and submit a Special Report to the Commission within the next 30 days outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the loop to operable status.

b. If both residual heat removal loops become inoperable during cold shutdown operation, close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere prior to the reactor coolant average temperature exceeding 200°F, restore at least one residual

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F11

TABLE 4.1-3 (Continued)
FREQUENCIES FOR EQUIPMENT TESTS

		Check	Frequency	Maximum Time Between Test
13.	~~Deleted~~			
14.	~~Fans and associated charcoal and Absolute Filters for Residual Heat Removal Compartments (HVE-5a and 5b)~~	~~Fans functioning. Laboratory tests on charcoal must show ≥ 99% iodine removal. In-place test must show ≥ 99% removal of polydispersed DOP particles by the HEPA filters and Freon by the charcoal filters.~~	~~Once per operating cycle.~~	~~NA~~
15.	Isolation Seal Water System	Functioning	Each refueling shutdown	NA
[SR 3.4.12.7] 16.	Overpressure Protection System	Functioning	~~Each refueling shutdown~~ 18 MO	NA
17.	Primary Coolant System check valves	Functioning	1. Periodic leakage testing[a][b] on each [c]valve listed in Table 3.1-1 shall be accomplished prior to entering reactor operation condition (1) after every time the plant is placed in the cold shutdown condition for refueling. (2) after each time the plant is placed in a cold shutdown condition for 72 hours if testing has not been accomplished in the preceding 9 months. (3) after maintenance. repair or replacement work is performed.	

LA8

See 3.6.8

See 3.4.14

[a] To satisfy ALARA requirements. leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

[b] Minimum test differential pressure shall not be less than 150 psid.

[c] More than one valve may be tested in parallel. The combined leakage shall not exceed 5.0 gpm. Redundant valves in each line shall not be tested in series.

ITS

TABLE 4.1-1 (Continued)

	Channel Description	Check	Calibrate	Test		Remarks
30.	Reactor Trip Breakers	N.A.	N.A..	M(1)	(1)	The reactor trip breaker trip actuating device operational test shall verify the operability of the UV trip attachment and the shunt trip attachment, individually.
[SR3.4.12.6] [SR3.4.12.7] 31.	Overpressure Protection System	~~N.A.~~	~~R~~ (18 months)	~~M~~ (31 days)		

SR 3.3.1

Specification 3.4.12

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ITS

A1

c. Operating the solenoid air control valves and check valves for their associated accumulators in PORV control systems through one complete cycle of full travel or function testing of individual components.

4.2.4.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed in order to meet the requirements of Specification 3.1.1.5.b. or c.

4.2.4.3 The accumulator for the PORVs shall be demonstrated OPERABLE at each refueling by isolating the normal air and nitrogen supplies and operating the valves through a complete cycle of full travel.

4.2.5 Low-Temperature Overpressure Protection

4.2.5.1 Each PORV shall be demonstrated OPERABLE by:

[SR 3.4.12.6] a. Performance of an ANALOG CHANNEL OPERATIONAL TEST on the actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE; and

[SR 3.4.12.7] b. Performance of a CHANNEL CALIBRATION at ~~each refueling shutdown~~ 18 months; and

[SR 3.4.12.5] c. Verifying the PORV block valve is open at least once per 72 hours when the PORV is being used for overpressure protection.

and need not be repeated here. This change is administrative, and has no adverse impact on safety.

A20 CTS Specification 3.1.2.1.d.6, which permits startup operations to continue with inoperable PORVs, is not retained in the ITS. Such operational situations are adequately addressed in ITS Specification 3.0.2. This change is administrative, and has no adverse impact on safety.

A21 The CTS is revised to adopt ISTS SR 3.4.13.2, which requires verification of SG tube integrity in accordance with the SG Tube Surveillance Program. This SR emphasizes the importance of SG tube integrity. Since the SG Tube Surveillance Program already exists in CTS Specification 4.2.1.1, and does not impose any new requirements, this change is administrative and has no adverse impact on safety.

A22 CTS Specification 3.1.5.4 requires pressure isolation valve (PIV) leakage to be maintained within limits. ITS Specification 3.4.14 requires each PIV to be OPERABLE. This is a change to the nomenclature used in the ISTS to more appropriately describe the Specification. This change is administrative, and has no adverse impact on safety.

A23 CTS Specification 3.1.2.1 is modified to add LCO 3.4.12.d to the LCO. LCO 3.4.12.d requires no SI pump be capable of injecting into the RCS with any RCS cold leg temperature less than 175°F. Since this requirement existed in the CTS prior to the change to CTS, for the plant condition when any RCS cold leg temperature is less than 175°F, this change is administrative, and has no adverse impact on safety.

A24 CTS Table 4.1-2, Item 9 and Note 3 requires periodic sampling of stack iodine and particulate. This sampling requirement duplicates sampling required by CTS Table 4.10-2 which is relocated (DOC R1 in Relocated Specifications). Since this requirement duplicates relocated CTS requirements, its elimination is considered to be administrative.

A25 Consistent with existing plant design and operations, a change to the Applicability of CTS 3.1.5.4.a has been proposed which limits applicability of the specification to exclude the valves in the RHR flow path when in or during the transition to or from the RHR mode of operation. This is an administrative change because the existing specification has never been applied to these valves when the flow path described above is in use. This is acceptable practice because when the plant is in the transition to or from RHR operation, the RCS pressure is low and the RHR interlock is no longer required to protect the piping from a manual opening of the RHR valves. Normally, ITS LCO 3.4.14 is met when both PIV leakage is within limits and when the RHR interlock is operable. Below the RHR interlock setpoint, the interlock is not

M21 CTS Specifications 3.1.1.5.a.2, 3.1.1.5.b.3, 3.1.1.5.c.2, and 3.1.1.5.d.4 require that, under certain conditions related to inoperable PORVs, the unit be placed in HOT SHUTDOWN within 12 hours and cooled down to T_{avg} < 350°F within the following 12 hours. ITS Specification 3.4.11 requires that the unit be in MODE 3 within 6 hours, and MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. This change imposes more restrictive requirements, and has no adverse impact on safety.

M22 CTS Specification 3.1.1.5.a.2, Footnote 2, which permits power operation to continue under certain conditions with a PORV block valve closed, is not retained in the ITS. CTS Footnote 2 applies to RCS leakage that has been detected through the PORV that does not exceed the CTS requirements of Specification 3.1.5.2. Since the ITS does not allow closure of the PORV block valve except in accordance with Required Actions A.1 and E.1, the elimination of the requirements of CTS 3.1.1.5 note 2 is more restrictive, and has no adverse impact on safety.

M23 CTS Specification 3.1.1.5.f, which allows that PORV valve trains need not be declared inoperable during surveillance testing of the PORVs and their associated block valves, is not retained in the ITS. During the performance of surveillances that result in the inoperability of the PORVs or their associated block valves, ITS 3.4.11 requires appropriate Conditions to be entered and Required Actions to be taken. This change represents an additional restriction on plant operation necessary to ensure, during the performance of surveillances, that an unrecognized loss of the PORV relief function does not occur and that the duration of any PORV or associated block valve inoperabilities are limited to those approved Completion Times associated with ITS 3.4.11 ACTIONS. This change imposes more restrictive requirements, and has no adverse impact on safety.

M24 CTS Specifications 3.1.2.1.d.1.B, 3.1.2.1.d.2.B and 3.1.2.1.d.3 require that, under certain conditions, the RCS be depressurized and vented to the containment within 12 hours. ITS Specification 3.4.12 requires that the depressurization and venting actions be completed within 8 hours. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel. The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements. This change imposes more restrictive requirements, and has no adverse impact on safety.

M25 The CTS is revised to adopt LCO 3.4.12.b (accumulator isolation); ITS Specification 3.4.12 Applicability Note; ACTIONS A, B, C, D and G (last two conditions); and SRs 3.4.12.1 and Note, 3.4.12.2 and Note, and

3.4.12.3 to require that the RCS be adequately protected from excessive mass input capability during low temperature operation. LCO 3.4.12.b and the Applicability Note requires the accumulators to be isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature. These restrictions are necessary to limit the coolant input capability consistent with assumptions of the analysis. With two or more SI pumps capable of injection when RCS cold leg temperature ≥ 175°F, Action A requires immediately initiating action to limit the number of SI pumps capable of injection. With one or more SI pumps capable of injection when RCS cold leg temperature ≤ 175°F, Action B requires immediately initiating action to disable any SI pump capable of injection. To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition. With an accumulator not isolated when required, Action C requires isolation of the accumulator within one hour. If isolation is needed and cannot be accomplished in 1 hour, Required Action D.1 and Required Action D.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to > 350°F, an accumulator pressure of 600 psig cannot exceed the LTOP limits if the accumulators are fully injected. Depressurizing the accumulators below the LTOP limit also gives this protection. The Completion Times are based on operating experience that these activities can be accomplished in these time periods consideration that an event requiring LTOP is not likely in the allowed times.

Action G requires the RCS be depressurized and a vent must be established within 8 hours when:

a. Both required PORVs are inoperable; or

b. A Required Action and associated Completion Time of Condition A, B, C, D, E or F is not met; or

c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E, or F.

The vent must be sized ≥ 3 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed

to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel. The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

The SRs require verification that the LCO requirements are met. The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

Since this change imposes new requirements, it is more restrictive, and has no adverse impact on safety.

M26 CTS Specification 3.3.1.3 requires that the SI pump breakers be racked out when RCS temperature is below 350°F and the system is not vented to containment atmosphere. The provisional statement regarding venting the system to containment atmosphere is not retained in the ITS This restriction is necessary to limit the coolant input capability consistent with assumptions of the analysis. This change is therefore more restrictive, and have no adverse impact on safety.

M27 CTS Specifications 3.1.5.1, 3.1.5.2, and 3.1.5.3, which provide requirements for unidentified, identified, and primary to secondary RCS operational leakage, are revised to adopt the ISTS Specification 3.4.13 Completion Times associated with the Required Actions. The four hour Completion Time for Action A allows time to verify leakage rates and either identify unidentified LEAKAGE or reduce LEAKAGE to within limits before the reactor must be shut down. The Action B Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. These Completion Times are either more restrictive than those in the CTS, or are added as new requirements where no time limits exist. This change therefore imposes more restrictive requirements, and has no adverse impact on safety.

M28 The CTS is revised to adopt LCO 3.4.13.a to require that reactor coolant pressure boundary leakage not be permitted. No pressure boundary LEAKAGE is allowed, being indicative of material deterioration. LEAKAGE of this type is unacceptable as the leak itself could cause further deterioration, resulting in higher LEAKAGE Since this change imposes new requirements, it is more restrictive and has no adverse impact on safety.

M29 The CTS is revised to adopt ISTS Specification 3.4.14 ACTIONS Notes, ACTION B and SR 3.4.14.2 to require that intersystem leakage be

containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions. SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation. SR 3.4.15.4 requires the performance of a CHANNEL CALIBRATION for each of the containment atmosphere radiation monitor instrumentation channel. The calibration verifies the accuracy of the instrument string. The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable. This change constitutes a more restrictive change necessary to help ensure these instruments are maintained OPERABLE.

M33 Not Used.

M34 CTS Specification 3.1.4 requires, when the specific activity of the reactor coolant exceeds 1.0 μCi/gram DOSE EQUIVALENT I-131 or 100/$\bar{E}$ μCi/gram, that certain sampling and analysis activities be performed until the specific activity is restored to within limits. ITS Specification 3.4.16 requires these activities be performed only when the reactor coolant specific activity exceeds 1.0 μCi/gram DOSE EQUIVALENT I-131. With the gross specific activity in excess of the allowed limit, the unit must be placed in a MODE in which the requirement does not apply. The change within 6 hours to MODE 3 and RCS average temperature < 500°F lowers the saturation pressure of the reactor coolant below the setpoints of the main steam safety valves and prevents venting the SG to the environment in an SGTR event. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 below 500°F from full power conditions in an orderly manner and without challenging plant systems. This change therefore imposes more restrictive requirements, and has no adverse impact on safety.

M35 CTS Specification 3.1.2.1.d, which requires that the LTOP setpoint be less than or equal to 420 psig, is revised in LCO 3.4.12.a.1 to require the setpoint to be ≤ 400 psig and an allowable value of ≤ 418 psig. The lower setpoint is necessary to support the overpressure transient analysis that permits utilization of a single OPERABLE SI train in MODE 4. The allowable value imposes a maximum allowable drift for the setpoint that was not previously included in the CTS. As stated in the CP&L Letter dated February 18, 1997, the actual nominal trip setpoint entered into the bistable is more conservative than that specified by the allowable value to account for changes in random measurement errors

detectable by a Channel Operational Test (COT). One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the allowable value, the channel is considered OPERABLE.

This change therefore imposes more restrictive requirements, and has no adverse impact on safety.

M36 CTS Specification 3.1.1.2 requires two steam generators to be operable whenever the average primary coolant temperature is above 350°F. ITS Specification 3.4.5 requires two RCS loops to be OPERABLE in MODE 3. The ITS Bases for Specification 3.4.5 describes that an OPERABLE RCS loop consists of one OPERABLE reactor coolant pump and one OPERABLE steam generator in accordance with the Steam Generator Tube Surveillance Program, which has a water level within required limits. This LCO ensures forced circulation of the reactor coolant to remove decay heat from the core and to provide proper boron mixing. As a result, the ITS Specification 3.4.5 requirement constitutes an additional restriction on plant operation necessary to help ensure decay heat removal capability is maintained.

M37 CTS Specification 3.1.2.1.d requires the overpressure protection system to be OPERABLE whenever RCS temperature is less than or equal to 350°F and the reactor vessel head is on the reactor vessel and the RCS is not vented. Implicit in CTS Specification 3.1.2.1.d is the allowance that adequate overpressure protection is provided by removal of the reactor vessel head or venting the RCS. ITS Specification 3.4.12.a.2 is added to provide the details of what constitutes acceptable low temperature overpressure protection (the RCS depressurized and an RCS vent of $\geq$ 3 square inches). Adding these details into the Technical Specifications represents an additional restriction on unit operation and is necessary to ensure protection of the reactor coolant pressure boundary from a low temperature overpressure event.

M38 The CTS is revised by adopting ISTS Specification 3.4.5 LCO "Note," Specification 3.4.6 LCO "Note 1," and Specification 3.4.7 LCO "Note 1." These Notes permit all RCPs or RHR pumps to be de-energized for up to 1 hour in any 8 hour period, to permit tests that are designed to validate various accident analyses values. CTS Specification 3.1.1.1.a currently allows operation with less than two RCPs in operation when the conditions set forth in CTS Specifications 3.1.1.1.a.1, 3.1.1.1.a.2, and 3.1.1.1.a.3 are met. The CTS has no time restriction for operation in in this condition. Because these notes impose a time restriction on operation with one or no RCPs in operation, this change is a more restrictive change. This change is acceptable, however, because unlimited operation with no RCPs in operation could permit boron stratification. In addition, the Note may only be used if no operations which could cause a reduction of RCS boron concentration are being performed, core outlet temperature reduction of RCS boron concentration

are being performed, core outlet temperature is maintained at least 10 degrees F below saturation temperature, and measures are taken to preclude a power excursion resulting from an inadvertent control rod withdrawal event (for Specifications 3.4.5 and 3.4.6). Industry operating experience has also shown that boron stratification is not a problem during this short period with no forced flow.

M39 CTS Specification 3.3.1.4.a, which requires the inoperable RHR loop to be restored within 14 days if one RHR loop is inoperable, is revised in ITS LCO 3.4.7 Required Actions A.1 and A.2 to require a Completion Time of immediately. This change imposes a more restrictive completion time. If one RHR train is inoperable and the required SG has secondary side water level < 16% or the RCS is vented, redundancy for heat removal is lost. Action must be initiated immediately to restore a second RHR train to OPERABLE status or to restore the required SG secondary side water level and the RCS pressure boundary. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal. Therefore, this change has no adverse impact on safety.

conditions are present, prior to assuming the SG is capable of replacing an RHR loop, are contained in the normal operating procedures and are not provided in the specification. This change provides more flexibility in operation, and is therefore less restrictive. This change is acceptable, however, because with either choice, redundant decay heat removal systems are OPERABLE and available for use. In MODE 5 with the RCS loops filled, the primary function of the reactor coolant is the removal of decay heat and transfer this heat either to the steam generator (SG) secondary side coolant or the component cooling water via the residual heat removal (RHR) heat exchangers. While the principal means for decay heat removal is via the RHR System, the SGs are specified as a backup means for redundancy when the RCS is not vented. Even though the SGs cannot produce steam in this MODE, they are capable of being a heat sink due to their large contained volume of secondary water. As long as the SG secondary side water is at a lower temperature than the reactor coolant, heat transfer will occur. The rate of heat transfer is directly proportional to the temperature difference. This change is consistent with NUREG-1431.

L7 CTS Specification 3.1.1.3.c.1 requires that pressurizer code safety valve lift settings be between 2485 psig and 2560 psig. ITS Specification 3.4.10 requires that safety valve lift settings be between 2410 psig and 2560 psig. This is a relaxation of requirements, and is less restrictive. This change is acceptable, however, since the same level of overpressure protection is provided. The wider OPERABILITY range of 2485 psig ± 3% allows for drift during valve setpoint test intervals, as permitted by Section III of the ASME Code. During setpoint testing, the valves are reset to 2485 psig ± 1%, as required by Section XI of the ASME Code. This change is consistent with NUREG-1431.

L8 CTS Specification 3.3.1.3 requires that the SI pump breakers be racked out when RCS temperature is below 350°F and the system is not vented to containment atmosphere. ITS LCO 3.4.12.c requires all but one SI pump to be made incapable of injecting into the RCS when the RCS temperature is ≥ 175°F. This is a relaxation of requirements, and is less restrictive. This change is acceptable based on a new overpressure protection analysis that has been performed to allow OPERABILITY of one train of SI in MODE 4. This analysis assumes one SI pump capable of injection into the RCS with RCS temperature ≥ 175°F and < 350°F.

L9 CTS Specification 3.1.1.3.c, which requires that all three pressurizer code safety valves be operable when RCS temperature is above 350°F, is revised to add ITS LCO 3.4.10 NOTE, which allows the safety valve lift settings to be outside the LCO limits for the purpose of setting the safety valves under ambient (hot) conditions. Because this note allows the pressurizer safety valves to be potentially inoperable in MODE 3 until the safety valves can be tested and set, this change is less

LESS RESTRICTIVE CHANGES
("L8" Labeled Comments/Discussions)

Carolina Power & Light Company has evaluated the proposed Technical Specification change and has concluded it does not involve a significant hazards consideration. Our conclusion is in accordance with the criteria set forth in 10 CFR 50.92. The bases for the conclusion that the proposed change does not involve a significant hazards consideration are discussed below.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change does not involve any physical alteration of plant systems, structures or components. The proposed change allows one SI pump to be capable of injection into the RCS when the RCS temperature is ≥ 175°F and < 350°F. The change is acceptable since an analysis has been performed that shows adequate margin to required limits is provided by the Low Temperature Overpressure Protection (LTOP) system in the event of an inadvertent actuation of the SI pump under these conditions. Therefore, the consequences and probability of an accident previously evaluated is not changed.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve any physical alteration of plant systems, structures or components. The proposed change will assure that the assumptions of the LTOP analysis are maintained. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

   Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does this change involve a significant reduction in a margin of safety?

   An analysis has been performed which resulted in adequate margin to the reactor vessel pressure temperature limits curves for the plant configuration associated with this change. This analysis supports automatic safety injection capability in MODE 4, which was not previously supported by analysis and was therefore restricted in the Technical Specifications. This analysis has resulted in a reduction in the available margin to the 10 CFR 50 Appendix G limit in the event of an overpressure event of the RCS. However, the overall reduction in safety margin is at least partially offset by the increased margin of safety associated with permitting automatic safety injection capability in MODE 4. Therefore, this change does not involve a significant reduction in a margin of safety.

CTS

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

[3.1.2.1.d] LCO 3.4.12 [3.3.1.3]

An LTOP System shall be OPERABLE with a maximum of one [high pressure injection (HPI)] pump [and one charging pump] capable of injecting into the RCS and the accumulators isolated and either a or b below. (15) (2)

Insert 3.4.12-1

a. Two RCS relief valves, as follows:

1. Two power operated relief valves (PORVs) with lift settings within the limits specified in the RTLR or (4)

[2. Two residual heat removal (RHR) suction relief valves with setpoints ≥ [436.5] psig and ≤ [463.5] psig, or] (21)

[3. One PORV with a lift setting within the limits specified in the PTLR and one RHR suction relief valve with a setpoint ≥ [436.5] psig and ≤ [463.5] psig].

b. The RCS depressurized and an RCS vent of ≥ [2.07] square inches. (15)

[3.1.2.1.d] APPLICABILITY: MODE 4 (5) when all RCS cold leg temperature is ≤ [275]°F and 5 (15)
MODE 5
MODE 6 when the reactor vessel head is on.

[M25]

----------NOTE----------
Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the RTLR (4)

Figures 3.4.3-1 and 3.4.3-2

An LTOP System shall be OPERABLE with the following requirements met:

a. 1. Two power operated relief valves (PORVs) with the lift settings of ≤ 400 psig and an allowable value ≤ 418 psig,

OR

2. The RCS depressurized and an RCS vent of ≥ 3 square inches;

b. The accumulator isolation valves closed and deenergized;

c. A maximum of one Safety Injection (SI) pump capable of injecting into the RCS when all cold leg temperatures are ≥ 175°F; and

d. No SI pumps capable of injecting into the RCS when any cold leg temperature is < 175°F.

CTS

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
[M25]	A. Two or more ~~HPI~~ SI pumps capable of injecting ~~into the~~ RCS with all RCS cold leg temperature ≥ 175°F.	A.1 Initiate action to verify a maximum of ~~one~~ ~~HPI~~ SI pump is capable of injecting into the RCS. 51	Immediately
[M25]	~~B. Two or more charging pumps capable of injecting into the RCS.~~	~~B.1 ---NOTE--- Two charging pumps may be capable of injecting into the RCS during pump swap operation for ≤ 15 minutes. ---~~ ~~Initiate action to verify a maximum of [one] charging pump is capable of injecting into the RCS.~~	~~Immediately~~
[M25]	C. ~~An~~ isolation valve accumulator not ~~isolated~~ when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in ~~the PTLR.~~ Figures 3.4.3-1 and 3.4.3-2	C.1 ~~Isolate~~ Closed and deenergized affected accumulator isolation valve. Close and deenergize	1 hour

(continued)

15 15 15 2 4

Insert 3.4.2-2

Supplement 3

ITS INSERT 3.4.12-2 (LTOP System)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more SI pumps capable of injecting into the RCS with any RCS cold leg temperature < 175°F.	B.1 Initiate action to verify no SI pumps capable of injecting into the RCS.	Immediately

ITS INSERT 3.4.12-3 (LTOP System)

Not used.

GTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M25] D. Required Action and associated Completion Time of Condition B or C not met.	D.1 Increase RCS cold leg temperature to > 275 °F. 350 OR D.2 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	12 hours 12 hours Figures 3.4.3-1 and 3.4.3-2
[3.1.2.1.d] E. One required RCS relief valve (PORV) inoperable in MODE 4.	E.1 Restore required RCS relief valve (PORV) to OPERABLE status.	7 days
[3.1.2.1.d] F. One required RCS relief valve (PORV) inoperable in MODE 5 or 6.	F.1 Restore required RCS relief valve (PORV) to OPERABLE status.	24 hours

(continued)

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[3.1.2.1.d] G. Two required RCS ~~relief valves~~ PORV inoperable. (3)	G.1 Depressurize RCS and establish RCS vent of ≥ ~~[illegible]~~ square inches. (3)	8 hours
OR Required Action and associated Completion Time of Condition A. ~~B.~~ D. E. or F not met.		
OR LTOP System inoperable for any reason other than Condition A. ~~B.~~ C. D. E. or F.		

SURVEILLANCE REQUIREMENTS

NOTE
Only required to be met when all RCS Cold leg temperatures ≥ 175°F

SURVEILLANCE		FREQUENCY
[M25] SR 3.4.12.1	Verify a maximum of ~~one~~ ~~NPI~~ (SI) pump is capable of injecting into the RCS.	12 hours INSERT 3.4.12-5
[M25] ~~SR 3.4.12.2~~	~~Verify a maximum of one charging pump is capable of injecting into the RCS.~~	~~12 hours~~ (15)
[M25] SR 3.4.12.3	Verify each accumulator is ~~isolated.~~ closed and deenergized (isolation valve)	12 hours (2)

(continued)

Supplement 3

ITS Insert 3.4.12-4 (LTOP)

Not Used.

ITS Insert 3.4.12-5 (LTOP)

SURVEILLANCE		FREQUENCY
SR 3.4.12.2	----------NOTE---------- Only required to be met when any RCS cold leg temperature is <175°F. ---------- Verify no SI pumps capable of injecting into the RCS.	 12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
[SR 3.4.12.4	Verify RHR suction valve is open for each required RHR suction relief valve.	12 hours]
[3.1.2.1.4] SR 3.4.12.5	----------NOTE---------- Only required to be performed when complying with LCO 3.4.12 ---------- Verify RCS vent ≥ [2.07] square inches open.	12 hours for unlocked open vent valve(s) AND 31 days for locked open vent valve(s)
[4.2.5.1.c] SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	72 hours
[SR 3.4.12.7	Verify associated RHR suction isolation valve is locked open with operator power removed for each required RHR suction relief valve.	31 days]
[4.2.5.1.a] [T4.1-1 (31)] SR 3.4.12.8	----------NOTE---------- Not required to be met until 12 hours after decreasing RCS cold leg temperature to ≤ [275]°F. ---------- Perform a COT on each required PORV, excluding actuation.	31 days thereafter

(continued)

Once within 31 days prior to entering Mode 4, 5, or 6 when the reactor vessel head is on AND

Supplement 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
[4.2.5.b] [T4.1-1 (31)] [T4.1-3(16)] SR 3.4.12.9 Perform CHANNEL CALIBRATION for each required PORV actuation channel.	18 months

1 In the conversion of the HBRSEP current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes which involve the insertion of plant specific terms or parameters are used to preserve consistency with the CTS and licensing basis.

2 ISTS LCO 3.4.12, Required Action C.1, and SR 3.4.12.3 are modified in ITS to include the requirement to deenergize the accumulator isolation valves when closed in accordance with the specification. Deenergization of the valves is necessary to assure that the valves do not open and overpressurize the RCS during a postulated inadvertent Safety Injection signal event that occurs when LCO 3.4.12 is applicable.

3 TSTF-60 revisions are not incorporated in HBRSEP ITS 3.4.15 (NUREG-1431 Specification 3.4.15) since HBRSEP ITS 3.4.15 Required Action F.1 does not allow continued operation when all required RCS leakage detection systems are inoperable (Required Action F.1 requires immediate entry into LCO 3.0.3). As a result, it is inappropriate to allow the requirements of LCO 3.0.4 to not be applicable for Condition F of HBRSEP ITS 3.4.15. Moving the placement of the "LCO 3.0.4 is not applicable" Note to prior to the start of the ACTIONS Table (per TSTF-60), would allow the requirements of LCO 3.0.4 to not be applicable while complying with Required Action F.1 of HBRSEP ITS 3.4.15.

4 ITS Specifications 3.4.3 and 3.4.12 are modified by removing references to the Pressure and Temperature Limits Report (PTLR), and retaining CTS Figures 3.1-1 and 3.1-2, which provide RCS heatup and cooldown limitations, respectively, consistent with current licensing basis. The curves depicted in these figures were updated in 1994 to cover operation up to 24 effective full power years (EFPY).

5 ITS Specifications 3.4.5, 3.4.6, and 3.4.7 contain a Note, permitting RCPs and RHR pumps to be de-energized for ≤ 1 hour per 8 hour period. This Note is modified by changing the phrase, "per 8 hour period," to "in any 8 hour period," to eliminate any interpretation that these pumps can be de-energized for consecutive 1 hour periods in two 8 hour periods.

6 ITS Specifications 3.4.5 and 3.4.6 are modified to reinforce and clarify the requirements for forced RCS circulation when the Rod Control System is capable of rod withdrawal. HBRSEP control rods are withdrawn 5 steps during all normal heatup and cooldown operations to eliminate thermal binding in the dashpots. This requires some modification to these Specifications to recognize this condition, and the potential for an inadvertent rod withdrawal accident. In addition, LCO 3.4.5 is revised

to reflect the allowances of CTS 3.1.1.1.a which were approved in Amendment No. 87 dated November 7, 1984. Commensurate changes have also been made to the Actions and Surveillance Requirements.

7 ITS Specifications 3.4.6, 3.4.7 and 3.4.8 are modified by replacing the term, "loop," with the term, "train," when referring to the RHR System. Plant design basis consists of 2 RHR pumps and heat exchangers (and attendant power, instrumentation and control functions), arranged in parallel in a single piping circuit, thereby not having full redundancy for passive failures, as the term "loop" would imply.

8 ITS Specifications 3.4.6 and 3.4.7 are modified, consistent with current licensing basis, to require a steam bubble in the pressurizer, or SG temperature < 50oF above RCS temperature, prior to starting a reactor coolant pump during all modes of operation.

9 ITS Specification 3.4.6 is modified to clarify the Actions to be taken under specified conditions of applicability regarding those loops or trains which are OPERABLE and operating. This change was proposed because the ISTS does not include a Required Action for the conditions where only one required RCS Loop or one required RHR train is inoperable. This change is generic, has been accepted by the Westinghouse Owners Group, and is currently being reviewed by the Technical Specifications Task Force (TSTF).

10 ITS Specifications 3.4.7 and 3.4.8 are modified in LCO Note 2 to eliminate reference to one RHR train being in operation when the other is inoperable and de-energized for surveillance testing. Plant design basis is such that the active components of the RHR System are redundant, but the piping is not. Surveillance testing can not be performed on one train while the other train is operating.

11 ITS Specification text presentation is modified for clarity, or to correct a typographical or grammatical error.

12 ITS Specification 3.4.9 is modified to require that a water level of ≤ 63.3%, which is the upper end of the normal water level control band (53.3 ± 10%), be maintained in MODE 1. This level requirement is consistent with initial condition assumptions used in the accident analysis for the load rejection accident as described in Updated Final Safety Analysis Report (UFSAR) Section 15.2.2. The results of the accident analyses (i.e., UFSAR Figure 15.2.2-10) show that there is a high probability that the pressurizer would become water solid in the event that the initial conditions of the accident assumed an initial pressurizer level of 92% as included in the ISTS. The Specification is also modified to require that a water level of ≤ 92% be maintained in MODES 2 and 3. A higher water level is necessary in the pressurizer during cooldown to maintain pressurizer cooldown limits. This level

requirement also assures that the reactor does not go solid when criticality is achieved. Subsequent requirements are renumbered as a result of this change.

This change may be generic, depending upon the bandwidth in percent for pressurizer level. At HBRSEP, Unit No. 2, the instrumentation is best characterized as "wide range," effectively covering the entire range of the pressurizer. A generic change to the ISTS was proposed to the Westinghouse Owners Group, and the generic change was rejected.

13 ITS Specification 3.4.9 is modified, consistent with current licensing basis, to reflect that 125 kW of pressurizer heaters are required, and that they are not specifically arranged in two distinct and separate groups. Additionally, the Frequency for verification of heater capacity in SR 3.4.9.2 is changed from 92 days to 18 months. The pressurizer design capacity for the pressurizer heaters is 1300 kw. The heaters are divided into two 450 kw backup banks and one 400 kw control bank. The pressurizer heaters are load shed from the buses during a loss of offsite power, after which 150 kw of heaters are manually loaded from one of the backup banks and 150 kw of heaters are manually loaded from the control bank. This procedure is demonstrated in SR 3.4.9.3. Lack of installed instrumentation mandates the need to use portable instrumentation, which creates a personnel safety hazard during operation. The Frequency of 18 months is considered adequate to detect heater degradation since considerable margin exists within each heater bank from which heaters to be powered from the emergency bus are be selected. Operating experience has shown that that the operational restraints from reduced pressurizer heater capacity would necessitate restoration of heater capacity prior to the requirement for 125 kw of heater capacity being challenged.

14 ITS Specification 3.4.10 is modified to reflect a safety valve OPERABILITY setpoint tolerance of + 3% to allow for drift, in accordance with Section III of the ASME Boiler and Pressure Vessel Code.

15 ITS Specifications 3.4.10 and 3.4.12 are modified to reflect assumptions in the LTOP analysis. These assumptions are as follows:

a. The LTOP arming temperature is 350°F;

b. One SI pump is capable of injecting into the RCS when RCS cold leg temperature is ≥ 175°F;

c. No SI pumps are capable of injecting into the RCS when RCS any cold leg temperature is < 175°F;and

Required Action B is added to ITS 3.4.12 to address the additional requirements of LCO 3.4.12 when the LCO is not met, and SR 3.4.12.2 is

added to ITS 3.4.12 to verify that the additional LCO requirements are met. ISTS SR 3.4.12.2 is not included in ITS because the current LTOP analysis supporting an automatic SI capability in MODE 4 does not require restrictions on charging pump OPERABILITY.

The LTOP analyses are described in detail in Enclosure 5 to CP&L letter dated August 27, 1996, in CP&L letter dated February 18, 1997, as modified by additional information submitted with Supplement 3 to the CP&L letter dated August 27, 1996

The analyses for LTOP covers the range of RCS temperatures up to 350°F. LTOP provides overpressure protection for the RHR System in addition to the RCS. This protection is required because the RHR relief valve capacity is sized in accordance with United States of America Standards (USAS) Code, which is insufficient to withstand the postulated overpressure event of an inadvertant actuation of the SI pump.

The remaining assumptions are consistent with an analysis performed for the purposes of converting the Current Technical Specifications (CTS) to the ITS to permit Operability of a single ECCS train in MODE 4, consistent with the ISTS LCO 3.5.3.

16 ITS Specification 3.4.11 is modified with the addition of a NOTE to SR 3.4.11.2, which states that this Surveillance is not required to be performed until 12 hours after entry into MODE 3. Testing of PORVs in MODE 3 is required in order to simulate the temperature and pressure environmental effects on PORVs. In many PORV designs, testing in MODE 4 or MODE 5 is not considered to be a representative test for assessing PORV performance under normal plant operating conditions. This is consistent with CTS Specification 4.2.4.1.b, which allows RCS temperature to exceed 350°F in order to perform the Surveillance Requirement.

17 ITS SR 3.4.11.3 is modified by removing the word "air" as being associated with the term "accumulator," since plant configuration is such that nitrogen is used in the accumulators.

18 ITS Specification is modified in SR 3.4.11.3 by changing "air" accumulators to "nitrogen" accumulators to reflect plant design.

19 ITS Specification 3.4.11 is modified by deleting SR 3.4.11.4, since the PORVs and associated block valves are all permanently powered from vital buses.

20 ITS Specification 3.4.11 is modified by adding a new SR 3.4.11.4 to verify that accumulators are capable of operating the PORVs through a complete cycle, which is consistent with current licensing basis.

unnecessary burden, since the plant is required to be in MODE 3 with Tavg < 500°F within 6 hours, thereby exiting the MODE of Applicability.

28 ITS SR 3.4.12.4 requires that an RCS vent ≥ 3 square inches is open. SR 3.4.12.4 is modified by a Note which states that this SR is only required to be "met" when complying with LCO 3.4.12.a.2. LCO 3.4.12 provides two options for complying with LCO 3.4.12.a. As a result, consistent with ITS 1.4, "Frequency," if LCO 3.4.12 is required to be complied with, then LCO 3.4.12.a.1 or LCO 3.4.12.a.2 is required to be met. ITS 1.4 uses the term "performed" to avoid SR 3.0.4 conflicts. In this case, no SR 3.0.4 conflicts exist. Therefore, the term "performed" is not replaced with "met".

29 SR 3.4.12.8 of the ISTS includes a Note that allows the completion of the performance of the Channel Operational Test for each required PORV to be delayed until 12 hours after entering into the applicable MODE in which the PORVs are required to provide Low Temperature Overpressure Protection (LTOP). The purpose of this Note is to provide time to establish the conditions necessary to perform the Surveillance since at some plants the required Channel Operational Test cannot be performed until the plant is in the LTOP MODES. HBRSEP Unit No.2 ITS Specification 3.4.12 is modified to delete this Note. At HBRSEP Unit No. 2, the design of the LTOP System is such that this Surveillance can be performed prior to entering the LTOP MODES. As a result of this change and the incorporation of ITS SR 3.0.4, the Frequency of SR 3.4.12.6 is modified to reflect the current licensing basis approved in Amendment No. 162.

30 LCO 3.4.9.b of the ISTS requires pressurizer heaters to be OPERABLE with a specified capacity (in kW) and be capable of being powered from an emergency power supply. The ISTS ACTIONS of Specification 3.4.9 address inoperable pressurizer heaters but do not address pressurizer heaters not capable of being powered from an emergency power supply. As a result of the definition of OPERABLE-OPERABILITY in ITS 1.1, Definitions, the pressurizer heaters would not be considered inoperable if they were incapable of being powered from an emergency power supply provided they were powered from a normal power supply. Therefore, Condition C is provided for the condition of the required pressurizer heaters not capable of being powered from an emergency power supply. This change is consistent with the current licensing basis approved in Amendment No. 59. HBRSEP Unit No.2 ITS Specification 3.4.9 Condition C requires restoration of the capability to power the required pressurizer heaters from an emergency power supply within 72 hours. The subsequent Condition is renumbered as a result of this change.

31 To meet the LCO requirements for ISTS Specification 3.4.7 (RCS Loops-MODE 5, Loops Filled), ISTS LCO 3.4.7.b provides the allowance to utilize the secondary side water level of the required plant specific

BASES

(Chemical and Volume Control System (CVCS)) 1

BACKGROUND (continued) - With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the makeup control system deactivated or the safety injection (SI) actuation circuits blocked. Due to the lower pressures in the LTOP MODES and the expected core decay heat levels, the makeup system can provide adequate flow via the makeup control valve. If conditions require the use of more than one (RHR) or charging pump for makeup in the event of loss of inventory, then pumps can be made available through manual actions. 41 41 SI

the single SI pump and CVCS can provide adequate makeup and core cooling in the event of a loss of inventory or core cooling.

The LTOP System for pressure relief consists of two PORVs with reduced lift settings, or two residual heat removal (RHR) suction relief valves, or one PORV and one RHR suction relief valve, or a depressurized RCS and an RCS vent of sufficient size. Two RCS relief valves are required for redundancy. One RCS relief valve has adequate relieving capability to keep from overpressurization for the required coolant input capability. 25

PORV Requirements

As designed for the LTOP System, each PORV is signaled to open if the RCS pressure approaches a limit determined by the LTOP actuation logic. The LTOP actuation logic monitors both RCS temperature and RCS pressure and determines when a condition not acceptable in the PTLR limits is approached. The wide range RCS temperature indications are auctioneered to select the lowest temperature signal. 6 P/T

The LTOP setpoint is biased to a minimum value at 350°F. The reduction in temperature below 350°F does not result in a lower setpoint.

The lowest temperature signal is processed through a function generator that calculates a pressure limit for that temperature. The calculated pressure limit is then compared with the indicated RCS pressure from a wide range pressure channel. If the indicated pressure meets or exceeds the calculated value, a PORV is signaled to open. 42

The PTLR presents the PORV setpoints for LTOP. The setpoints are normally staggered so only one valve opens during a low temperature overpressure transient. Having the setpoints of both valves within the limits in the PTLR ensures that the Reference 1 limits will not be exceeded in any analyzed event. 6 26

Insert B 3.4.12-1a 46

(continued)

Supplement 3

ITS Insert B.3.4.12-1a (LTOP)

The Trip Setpoint is the nominal value at which the LTOP bistable is set. The bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy (i.e., ± rack calibration + comparator setting accuracy). The trip setpoint and allowable value is based upon the analytical limit (i.e., the 10 CFR 50, Appendix G limit, less effects for dynamic head of operating Reactor Coolant Pumps (RCPs) and RHR pumps, static head due to location of pressure transmitters, and the pressure overshoot due to the mass and heat addition overpressure events). To account for the calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in the trip setpoint. The OPERABILITY of each transmitter or sensor can be evaluated when its "as found" calibration data are compared against its documented acceptance criteria. The LCO specifies both the instrument setpoint and an allowable value for the setpoint that represents the maximum allowable "as found" value for the instrument to be considered OPERABLE during calibration. The actual nominal trip setpoint entered into the bistable is more conservative than that specified by the allowable value to account for changes in random measurement errors detectable by a Channel Operational Test (COT). One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the allowable value, the channel is considered OPERABLE. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in the CP&L setpoint methodology procedure which is based upon current Instrument Society of America (ISA) standards.

BASES

BACKGROUND

PORV Requirements (continued)

When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

25

RHR Suction Relief Valve Requirements

During LTOP MODES, the RHR System is operated for decay heat removal and low pressure letdown control. Therefore, the RHR suction isolation valves are open in the piping from the RCS hot legs to the inlets of the RHR pumps. While these valves are open and the RHR suction valves are open, the RHR suction relief valves are exposed to the RCS and are able to relieve pressure transients in the RCS.

The RHR suction isolation valves and the RHR suction valves must be open to make the RHR suction relief valves OPERABLE for RCS overpressure mitigation. Autoclosure interlocks are not permitted to cause the RHR suction isolation valves to close. The RHR suction relief valves are spring loaded, bellows type water relief valves with pressure tolerances and accumulation limits established by Section III of the American Society of Mechanical Engineers (ASME) Code (Ref. 3) for Class 2 relief valves.

RCS Vent Requirements

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be capable of relieving the flow resulting from the limiting LTOP mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

For an RCS vent to meet the flow capacity requirement, it requires removing a pressurizer safety valve, removing a PORV's internals or physically blocking the valve stem of the PORV in the open position, and disabling its block valve in the open

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(continued)

BASES

BACKGROUND

RCS Vent Requirements (continued)

position or similarly establishing a vent by opening an RCS vent valve. The vent path(s) must be above the level of reactor coolant, so as not to drain the RCS when open.

APPLICABLE SAFETY ANALYSES

Safety analyses (Ref. 4) demonstrate that the reactor vessel is adequately protected against exceeding the Reference 1 P/T limits. In MODES 1, 2, and 3, and in MODE 4 with RCS cold leg temperature exceeding [275]°F, the pressurizer safety valves will prevent RCS pressure from exceeding the Reference 1 limits. At about [275]°F and below, overpressure prevention falls to two OPERABLE RCS relief valves or to a depressurized RCS and a sufficient sized RCS vent. Each of these means has a limited overpressure relief capability.

The actual temperature at which the pressure in the P/T limit curve falls below the pressurizer safety valve setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the PTLR curves are revised, the LTOP System must be re-evaluated to ensure its functional requirements can still be met using the RCS relief valve method or the depressurized and vented RCS condition.

The PTLR contains the acceptance limits that define the LTOP requirements. Any change to the RCS must be evaluated against the Reference 4 analyses to determine the impact of the change on the LTOP acceptance limits.

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

Mass Input Type Transients

a. Inadvertent safety injection; or

b. Charging/letdown flow mismatch.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Heat Input Type Transients

a. Inadvertent actuation of pressurizer heaters;

b. Loss of RHR cooling; or

c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following restrictions are required during the LTOP MODES to ensure that mass and heat input transients do not occur, which either of the LTOP overpressure protection means cannot handle:

a. Rendering all but ~~one~~ [HPI] pump ~~[and one charging pump]~~ incapable of injection; with all RCS cold leg temperatures ≥ 175°F

b. Deactivating the accumulator discharge isolation valves in their closed positions; ~~and~~

c. Disallowing start of an RCP if secondary temperature is more than ~~50~~°F above primary temperature in any one loop. LCO 3.4.6, "RCS Loops – MODE 4," and LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled," provide this protection; and

INSERT B 3.4.12-2

The Reference 4 analyses demonstrate that either one RCS relief valve or the depressurized RCS and RCS vent can maintain RCS pressure below limits when only one [HPI] pump ~~[and one charging pump are]~~ is [are] actuated. Thus, the LCO allows only ~~[one]~~ [HPI] pump ~~[and one charging pump]~~ OPERABLE during the LTOP MODES. Since neither one RCS relief valve nor the RCS vent can handle the pressure transient need from accumulator injection, when RCS temperature is low, the LCO also requires the accumulators to be isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the ~~PTLR~~ LTOP analyses.

~~The isolated accumulators must have their discharge valves closed and the valve power supply breakers fixed in their open positions. The analyses show the effect of accumulator discharge is over a narrower RCS temperature range ([175]°F and below) than that of the LCO ([275]°F and below).~~

INSERT B 3.4.12-3

(continued)

INSERT B 3.4.12-4

ITS Insert B.3.4.12-2 (LTOP System)

d. Rendering all SI pumps incapable of injection with any cold leg temperature < 175°F.

ITS Insert B.3.4.12-3 (LTOP System)

The analyses did not consider the accumulators as a credible mass input mechanism because there are multiple administrative controls to ensure isolation, including de-energizing valve control circuits (Ref. 7). Therefore, the ...

ITS Insert B.3.4.12-4 (LTOP System)

The P/T Limit Curve includes an instrument uncertainty margin of 60 psig. The P/T Limit Curve does not include static head and dynamic head corrections from the reactor vessel beltline pressure to the pressure transmitter. The actual instrument uncertainty has been determined to be 45.9 psig. The combination of the instrument uncertainty and static head and dynamic head corrections, is less than the 60 psig margin in the P/T Limit Curve.

BASES

APPLICABLE SAFETY ANALYSES

Heat Input Type Transients (continued)

Fracture mechanics analyses established the temperature of LTOP Applicability at [275]°F.

The consequences of a small break loss of coolant accident (LOCA) in LTOP MODE 4 conform to 10 CFR 50.46 and 10 CFR 50, Appendix K (Refs. 5 and 6), requirements by having a maximum of one [HPSI] pump and one charging pump OPERABLE and SI actuation enabled.

PORV Performance

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the limit shown in the PTLR. The setpoints are derived by analyses that model the performance of the LTOP System, assuming the limiting LTOP transient of one [HPSI] pump and one charging pump injecting into the RCS. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or below the derived limit ensures the Reference 1 P/T limits will be met.

The PORV setpoints in the PTLR will be updated when the revised P/T limits conflict with the LTOP analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," discuss these examinations.

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

[RHR Suction Relief Valve Performance]

The RHR suction relief valves do not have variable pressure and temperature lift setpoints like the PORVs. Analyses must show that one RHR suction relief valve with a setpoint at or between [436.5] psig and [463.5] psig will pass flow greater than that required for the limiting LTOP transient while maintaining RCS pressure less than the P/T limit curve. Assuming all relief flow requirements during the limiting LTOP event, an RHR suction relief valve will maintain RCS pressure to within the valve rated lift setpoint, plus an accumulation ≤ 10% of the rated lift setpoint.

Although each RHR suction relief valve may itself meet single failure criteria, its inclusion and location within the RHR System does not allow it to meet single failure criteria when spurious RHR suction isolation valve closure is postulated. Also, as the RCS P/T limits are decreased to reflect the loss of toughness in the reactor vessel materials due to neutron embrittlement, the RHR suction relief valves must be analyzed to still accommodate the design basis transients for LTOP.

The RHR suction relief valves are considered active components. Thus, the failure of one valve is assumed to represent the worst case single active failure.

25

RCS Vent Performance

With the RCS depressurized, analyses show a vent size of 2.07 square inches is capable of mitigating the allowed LTOP overpressure transient. The capacity of a vent this size is greater than the flow of the limiting transient for the LTOP configuration, one RHR pump and one charging pump OPERABLE, maintaining RCS pressure less than the maximum pressure on the P/T limit curve.

3

SI

6

in the LTOP analysis.

The RCS vent size will be re-evaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

The RCS vent is passive and is not subject to active failure.

(continued)

BASES

APPLICABLE SAFETY ANALYSES

RCS Vent Performance (continued)

The LTOP System satisfies Criterion 2 of the NRC Policy Statement.

LCO

This LCO requires that the LTOP System is OPERABLE. The LTOP System is OPERABLE when the minimum coolant input and pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the Reference 1 limits as a result of an operational transient.

To limit the coolant input capability, the LCO requires [one] [HPI] pump [and one charging pump] capable of injecting into the RCS and all accumulator discharge isolation valves closed and immobilized when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the PTLR.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. Two RCS relief valves, as follows:

1. Two OPERABLE PORVs; or

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set to the limit required by the PTLR and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits.

[2. Two OPERABLE RHR suction relief valves; or]

[An RHR suction relief valve is OPERABLE for LTOP when its RHR suction isolation valve and its RHR suction valve are open, its setpoint is at or between [436.5] psig and [463.5] psig, and testing has proven its ability to open at this setpoint.]

(continued)

no more than one SI pump be capable of injecting into the RCS with all RCS cold leg temperatures ≥ 175°F, and no SI pumps be capable of injecting into the RCS with any RCS cold leg temperature < 175°F.

BASES

LCO (continued)

[3. One OPERABLE PORV and one OPERABLE RHR suction relief valve; or]

b. A depressurized RCS and an RCS vent.

An RCS vent is OPERABLE when open with an area of ≥ [2.07] square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting LTOP transient.

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is ≤ [275]°F, in MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above [275]°F. When the reactor vessel head is off, overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the OPERABILITY of the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3 and MODE 4 above [275]°F.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure when little or no time allows operator action to mitigate the event.

The Applicability is modified by a Note stating that accumulator isolation is only required when the accumulator pressure is more than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves. This Note permits the accumulator discharge isolation valve Surveillance to be performed only under these pressure and temperature conditions.

(continued)

BASES (continued)

ACTIONS

A.1 and B.1

With two or more HPSI pumps capable of injecting into the RCS, RCS overpressurization is possible.

To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition.

Required Action B.1 is modified by a Note that permits two charging pumps capable of RCS injection for ≤ 15 minutes to allow for pump swaps.

C.1, D.1, and D.2

An unisolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

If isolation is needed and cannot be accomplished in 1 hour, Required Action D.1 and Required Action D.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to > [275]°F, an accumulator pressure of [600] psig cannot exceed the LTOP limits if the accumulators are fully injected. Depressurizing the accumulators below the LTOP limit from the PTLR also gives this protection.

The Completion Times are based on operating experience that these activities can be accomplished in these time periods and on engineering evaluations indicating that an event requiring LTOP is not likely in the allowed times.

E.1

In MODE 4 when any RCS cold leg temperature is ≤ [275]°F, with one required RCS relief valve inoperable, the RCS relief valve must be restored to OPERABLE status within a Completion Time of 7 days. Two RCS relief valves [in any combination of the PORVs and the RHR suction relief valves] are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

(continued)

ITS Insert B.3.4.12-6 (LTOP System)

. . . and all RCS cold leg temperatures ≥ 175°F, or one or more SI pumps capable of injecting into the RCS with any cold leg temperature < 175°F, RCS overpressurization is possible.

ITS Insert 3.4.12-7 (LTOP System)

Not used.

BASES

ACTIONS

E.1 (continued)

The Completion Time considers the facts that only one of the ~~RCS relief valves~~ PORVs is required to mitigate an overpressure transient and that the likelihood of an active failure of the remaining valve path during this time period is very low.

F.1

The consequences of operational events that will overpressurize the RCS are more severe at lower temperature (Ref. 8). Thus, with one of the two ~~RCS relief valves~~ PORVs inoperable in MODE 5 or in MODE 6 with the head on, the Completion Time to restore two valves to OPERABLE status is 24 hours.

The Completion Time represents a reasonable time to investigate and repair several types of relief valve failures without exposure to a lengthy period with only one OPERABLE ~~RCS relief valve~~ PORV to protect against overpressure events.

G.1

The RCS must be depressurized and a vent must be established within 8 hours when:

a. Both required ~~RCS relief valves~~ PORVs are inoperable: or

b. A Required Action and associated Completion Time of Condition A, B, D, E, or F is not met: or

c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E, or F.

The vent must be sized ≥ 2.07 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

(continued)

BASES

ACTIONS

G.1 (continued)

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of one HPSI pump and a maximum of one charging pump are verified incapable of injecting into the RCS, and the accumulator discharge isolation valves are verified closed and locked out.

The HPSI pumps and charging pumps are rendered incapable of injecting into the RCS through removing the power from the pumps by racking the breakers out under administrative control. An alternate method of LTOP control may be employed using at least two independent means to prevent a pump start such that a single failure or single action will not result in an injection into the RCS. This may be accomplished through the pump control switch being placed in "pull to lock" and at least one valve in the discharge flow path being closed.

The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.4

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction valve and RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. (Refer to SR 3.4.12.7 for the RHR suction isolation valve Surveillance.) This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet this LCO.

(continued)

Supplement 3

ITS Insert B.3.4.12-8 (LTOP System)

In addition, when any RCS cold leg temperature is < 175 °F, it must be verified that no SI pumps are capable of injecting into the RCS.

ITS Insert B.3.4.12-9 (LTOP System)

SR 3.4.12.1 is modified by a Note indicating that this SR is only required to be met when all RCS cold leg temperatures ≥ 175°F. Below an RCS temperature of 175°F, all SI pumps must be incapable of injection into the RCS as required by SR 3.4.12.2.

SR 3.4.12.2 is modified by a Note indicating that this SR is only required to be met when any RCS cold leg temperature is < 175°F. Below an RCS temperature of 175°F, all SI pumps must be incapable of injection into the RCS. Above an RCS temperature of 175 °F, only one SI pump may be capable of injecting into the RCS as required by SR 3.4.12.1.

BASES

SURVEILLANCE REQUIREMENTS

~~SR 3.4.12.4 (continued)~~

~~The RHR suction valve is verified to be opened every 12 hours. The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction valve remains open.~~

~~The ASME Code, Section XI (Ref. 8), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.~~

SR 3.4.12.~~5~~ 4

The RCS vent of ≥ ~~2.02~~ 3 square inches is proven OPERABLE by verifying its open condition either:

a. Once every 12 hours for a valve that cannot be locked.

b. Once every 31 days for a valve that is locked, sealed, or secured in position. A removed pressurizer safety valve fits this category.

The passive vent arrangement must only be open to be OPERABLE. This Surveillance is required to be ~~performed~~ met if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.12~~b~~ a.2.

SR 3.4.12.~~6~~ 5

The PORV block valve must be verified open every 72 hours to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

(continued)

Supplement 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.5 (continued)

The 72 hour Frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.

SR 3.4.12.7

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction valve and RHR suction isolation valve are open and by testing it in accordance with the Inservice Testing Program. (Refer to SR 3.4.12.4 for the RHR suction valve Surveillance and for a description of the requirements of the Inservice Testing Program.) This Surveillance is only performed if the RHR suction relief valve is being used to satisfy this LCO.

Every 31 days the RHR suction isolation valve is verified locked open, with power to the valve operator removed, to ensure that accidental closure will not occur. The "locked open" valve must be locally verified in its open position with the manual actuator locked in its inactive position. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve position.

SR 3.4.12.8

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ [275]°F and every 31 days on each required PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the PTLR allowed maximum limits in the PTLR. PORV actuation could depressurize the RCS and is not required.

The 12 hour Frequency considers the unlikelihood of a low temperature overpressure event during this time.

A Note has been added indicating that this SR is required to be met 12 hours after decreasing RCS cold leg temperature to ≤ [275]°F. The COT cannot be performed until in the LTOP MODES when the PORV lift setpoint can be reduced to the LTOP

(continued)

The Frequency of "Once within 31 days prior to entering MODE 4, 5, or 6 when the reactor vessel head is on AND 31 days thereafter" ensures that SR 3.4.12.6 is performed prior to entry into the MODES or specified condition of the Applicability and has been proven to be acceptable based on operating experience.

BASES

SURVEILLANCE REQUIREMENTS

~~SR 3.4.12.8~~ (continued)

~~setting. The test must be performed within 12 hours after entering the LTOP MODES.~~

SR 3.4.12.9

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required every 18 months to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. FSAR, Chapter 15.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. Generic Letter 90-06.
8. ASME, Boiler and Pressure Vessel Code, Section XI.

INSERT B3.4.12-10

INSERT B3.4.12-11

23 Not used.

24 Bases for ITS 3.4.11 are modified by adding a new SR 3.4.11.4 to verify that accumulators are capable of operating the PORVs through a complete cycle, consistent with current licensing basis.

25 Bases for ITS 3.4.12 and 3.4.14 are modified by deleting information related to RHR System suction relief valves, since such valves are not part of the plant design basis.

26 Bases for ITS 3.4.12 are modified by deleting reference to staggered setpoints for the PORVs in LTOP mode. Both PORVs are set at the same setpoint, and each valve alone has sufficient relieving capacity to prevent exceeding the LTOP pressure limit.

27 Bases for ITS 3.4.12 are modified by deleting reference to analyses of the effects of accumulator discharge, as no reference is provided. Appropriate text and reference to specific Westinghouse analyses is added.

28 Bases for ITS 3.4.12 are modified by removing reference to "pull to lock" pump control switch. Such a component is not a part of plant design basis. Additionally, Bases are modified to allow an equivalent means of preventing an SI pump from discharging into the RCS without disabling the pump. This change to the Bases is necessary to allow filling the accumulators while meeting the requirements of LCO 3.4.12. The NRC approved isolation of the SI injection lines as an alternative method in its Safety Evaluation to Amendment No. 42 to Technical Specifications, dated September 14, 1979.

29 HBRSEP was designed and licensed to the proposed Appendix A to 10 CFR 50, which was published in the Federal Register on July 11, 1967 (32FR10213). Appendix A to 10 CFR 50, which became effective in 1971, and was subsequently amended, is somewhat different from the proposed 1967 criteria. UFSAR section 3.1 includes an evaluation of HBRSEP with respect to the proposed 1967 criteria. ISTS statements concerning the general design criteria are modified in the ITS to reference the current licensing basis description in UFSAR Section 3.1.

30 Bases for ITS 3.4.13 and 3.4.15 are modified by removing reference to Regulatory Guide 1.45. HBRSEP is not committed to Regulatory Guide 1.45.

31 Bases for ITS 3.4.13 and 3.4.14 are modified to reflect a change in nomenclature for ITS Specification 3.4.14 from "RCS Pressure Isolation Valve (PIV) Leakage," to "RCS Pressure Isolation Valves (PIVs)," to more appropriately describe the Specification, which also includes requirements for the RHR interlock.

32 Not used.

33 Not used.

34 Bases for ITS 3.4.14 are modified by removing the term "typically," since the design pressure of the RHR System is 600 psig.

35 Bases for ITS 3.4.14 are modified to reflect a revision where Required Actions involving both PIV leakage and RHR interlock inoperability are made subject to shutdown actions if Completion Times are not met.

36 Bases for ITS 3.4.14 are modified by removing reference to the RHR System "autoclosure" function. This "autoclosure" as such function is not part of the plant design basis. The RHR interlock serves to prevent the RHR valves from opening when the RCS pressure is above the setpoint, but has no automatic closure function.

37 Bases for ITS 3.4.15 are modified to provide specific clarification with regard to what constitutes the minimum channel requirements for leakage detection.

38 Bases for ITS 3.4.16 are modified for ACTION B to reflect elimination of requirement to perform SR 3.4.16.2 when RCS gross specific activity is not within limit. SR 3.4.16.2 must be performed in order to verify "restoration" of the specific activity to within limits, and does not need to be otherwise performed. Further, if the Condition is entered and the plant is in MODE 2 in 4 hours or less, the Required Action is in conflict with the NOTE to SR 3.4.16.2, which states that the SR is only required to be performed in MODE 1. Performance of the SR is also an unnecessary burden, since the plant is required to be in MODE 3 with Tavg < 500oF within 6 hours, thereby exiting the MODE of APPLICABILITY.

39 Bases for ITS 3.4.12 are modified to reflect the assumptions of the RCS overpressure analysis which have been reflected in the ITS. These assumptions are as follows:

a. The LTOP arming temperature is 350°F;

b. One SI pump is capable of injecting into the RCS when RCS cold leg temperature is ≥ 175°F and < 350°F; and

c. No SI pumps are capable of injecting into the RCS when any RCS cold leg temperature is < 175°F.

Required Action B is added to ITS 3.4.12 to address the additional requirements of LCO 3.4.12 when the LCO is not met, and SR 3.4.12.2 is added to ITS 3.4.12 to verify that the additional LCO requirements are met.

40 Bases for ITS 3.4.1 are modified to reflect that uncertainties in the precision heat balance are accounted for in procedures.

41 Bases for ITS 3.4.12 are modified to reflect that makeup to the RCS is performed by the CVCS. HBRSEP is not equipped with a "makeup control system," as described in NUREG-1431.

42 Bases for ITS 3.4.12 are modified to reflect a constant pressure setpoint for LTOP.

43 Bases for ITS 3.4.12 are modified to reflect a current method for blocking open the PORVs to establish a vent path without disassembly of valve internals.

44 Bases for ITS 3.4.12 are modified to reflect that HBRSEP has no means of "fixing" a breaker in the open position other than opening the breaker. Opening the breaker prevents the accumulator isolation valve from opening on an SI signal, or being inadvertently opened from the control room.

45 TSTF-60 revisions are not incorporated in the Bases of HBRSEP ITS 3.4.15 (NUREG-1431 Specification 3.4.15) since HBRSEP ITS 3.4.15 Required Action F.1 does not allow continued operation when all required RCS leakage detection systems are inoperable (Required Action F.1 requires immediate entry into LCO 3.0.3). As a result, it is inappropriate to allow the requirements of LCO 3.0.4 to not be applicable for Condition F of HBRSEP ITS 3.4.15. Moving the placement of the "LCO 3.0.4 is not applicable" Note to prior to the start of the ACTIONS Table (per TSTF-60), would allow the requirements of LCO 3.0.4 to be not applicable while complying with Required Action F.1 of HBRSEP ITS 3.4.15.

46 Bases are modified to add a discussion of the LTOP setpoint and allowable values consistent with information provided to the NRC by letter dated February 18, 1997.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12 An LTOP System shall be OPERABLE with the following requirements met:

a. 1. Two power operated relief valves (PORVs) with the lift settings of ≤ 400 psig and an allowable value of ≤ 418 psig,

OR

2. The RCS depressurized and an RCS vent of ≥ 3 square inches;

b. The accumulator isolation valves closed and deenergized;

c. A maximum of one Safety Injection (SI) pump capable of injecting into the RCS when all cold leg temperatures are ≥ 175°F; and

d. No SI pumps capable of injecting into the RCS when any cold leg temperature is < 175°F.

APPLICABILITY: MODES 4 and 5,
MODE 6 when the reactor vessel head is on.

----------NOTE----------
Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in Figures 3.4.3-1 and 3.4.3-2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two or more SI pumps capable of injecting into the RCS with all RCS cold leg temperatures ≥ 175°F.	A.1 Initiate action to verify a maximum of one SI pump is capable of injecting into the RCS.	Immediately
B. One or more SI pumps capable of injecting into the RCS with any RCS cold leg temperature < 175°F.	B.1 Initiate action to verify no SI pumps capable of injecting into the RCS.	Immediately
C. An accumulator isolation valve not closed and deenergized when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in Figures 3.4.3-1 and 3.4.3-2.	C.1 Close and deenergize affected accumulator isolation valve.	1 hour
D. Required Action and associated Completion Time of Condition C not met.	D.1 Increase RCS cold leg temperature to > 350°F. OR	12 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. (continued)	D.2 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in Figures 3.4.3-1 and 3.4.3-2.	12 hours
E. One required PORV inoperable in MODE 4.	E.1 Restore required PORV to OPERABLE status.	7 days
F. One required PORV inoperable in MODE 5 or 6.	F.1 Restore required PORV to OPERABLE status.	24 hours
G. Two required PORVs inoperable. OR Required Action and associated Completion Time of Condition A, B, D, E, or F not met. OR LTOP System inoperable for any reason other than Condition A, B, C, D, E, or F.	G.1 Depressurize RCS and establish RCS vent of ≥ 3 square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	----------NOTE---------- Only required to be met when all RCS cold leg temperatures ≥ 175°F. ---------- Verify a maximum of one SI pump is capable of injecting into the RCS.	12 hours
SR 3.4.12.2	----------NOTE---------- Only required to be met when any RCS cold leg temperature < 175°F. ---------- Verify no SI pumps capable of injecting into the RCS.	12 hours
SR 3.4.12.3	Verify each accumulator isolation valve is closed and deenergized.	12 hours
SR 3.4.12.4	----------NOTE---------- Only required to be met when complying with LCO 3.4.12.a.2. ---------- Verify RCS vent ≥ 3 square inches open.	12 hours for unlocked open vent valve(s) <u>AND</u> 31 days for locked open vent valve(s)

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.5	Verify PORV block valve is open for each required PORV.	72 hours
SR 3.4.12.6	Perform a COT on each required PORV, excluding actuation.	Once within 31 days prior to entering MODE 4, 5, or 6, when reactor vessel head is on AND 31 days thereafter
SR 3.4.12.7	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	18 months

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B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.12 Low Temperature Overpressure Protection (LTOP) System

BASES

BACKGROUND

The LTOP System controls RCS pressure at low temperatures so the integrity of the reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature (P/T) limits of 10 CFR 50, Appendix G. The reactor vessel is the limiting RCPB component for demonstrating such protection. The maximum allowed PORV setpoint for LTOP is derived by analyses which model the performance of the LTOP System, assuming various mass input and heat input transients. Operation with a PORV setpoint less than or equal to the maximum setpoint ensures that Reference 1 criteria will not be violated with consideration for a maximum pressure over-shoot beyond the PORV setpoint which can occur as a result of time delays in signal processing and valve opening, instrument uncertainties, and single failure. The maximum allowed PORV setpoint for the LTOP is updated based on the results of examinations of reactor vessel material irradiation surveillance specimens performed as required by 10 CFR 50, Appendix H.

The reactor vessel material is less tough at low temperatures than at normal operating temperature. As the vessel neutron exposure accumulates, the material toughness decreases and becomes less resistant to pressure stress at low temperatures (Ref. 2). RCS pressure, therefore, is maintained low at low temperatures and is increased only as temperature is increased.

The potential for vessel overpressurization is most acute when the RCS is water solid, occurring only while shutdown; a pressure fluctuation can occur more quickly than an operator can react to relieve the condition. Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel. LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," requires administrative control of RCS pressure and temperature during heatup and cooldown to prevent exceeding the P/T limits.

This LCO provides RCS overpressure protection by having a minimum coolant input capability and having adequate pressure relief capacity. Limiting coolant input capability

(continued)

BASES

BACKGROUND (continued)

requires compliance with the requirements of LCO 3.4.12, items b, c, and d. The pressure relief capacity requires either two redundant RCS relief valves or a depressurized RCS and an RCS vent of sufficient size. One RCS relief valve or the open RCS vent is the overpressure protection device that acts to terminate an increasing pressure event.

With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the Chemical and Volume Control System (CVCS) deactivated or the SI actuation circuits blocked. Due to the lower pressures in the LTOP MODES and the expected core decay heat levels, the single SI pump and CVCS can provide adequate makeup and core cooling in the event of a loss of inventory or core cooling. If conditions require the use of more than one SI pump for makeup in the event of loss of inventory, then pumps can be made available through manual actions.

The LTOP System for pressure relief consists of two PORVs with reduced lift settings, or a depressurized RCS and an RCS vent of sufficient size. Two RCS relief valves are required for redundancy. One RCS relief valve has adequate relieving capability to keep from overpressurization for the required coolant input capability.

PORV Requirements

As designed for the LTOP System, each PORV is signaled to open if the RCS pressure approaches a limit determined by the LTOP actuation logic. The LTOP actuation logic monitors both RCS temperature and RCS pressure and determines when a condition not acceptable in the P/T limits is approached. The LTOP setpoint is biased to a minimum value at 350°F. The reduction in temperature below 350°F does not result in a lower setpoint. The wide range RCS temperature indications are auctioneered to select the lowest temperature signal.

The lowest temperature signal is processed through a function generator that calculates a pressure limit for that

(continued)

BASES

BACKGROUND

PORV Requirements (continued)

temperature. The calculated pressure limit is then compared with the indicated RCS pressure from a wide range pressure channel. If the indicated pressure meets or exceeds the calculated value, a PORV is signaled to open.

The Trip Setpoint is the nominal value at which the LTOP bistable is set. The bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy (i.e., ± rack calibration + comparator setting accuracy). The trip setpoint and allowable value is based upon the analytical limit (i.e., the 10 CFR 50, Appendix G limit, less effects for dynamic head of operating Reactor Coolant Pumps (RCPs) and RHR pumps, static head due to location of pressure transmitters, and the pressure overshoot due to the mass and heat addition overpressure events). To account for the calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in the trip setpoint. The OPERABILITY of each transmitter or sensor can be evaluated when its "as found" calibration data are compared against its documented acceptance criteria. The LCO specifies both the instrument setpoint and an allowable value for the setpoint that represents the maximum allowable "as found" value for the instrument to be considered OPERABLE during calibration. The actual nominal trip setpoint entered into the bistable is more conservative than that specified by the allowable value to account for changes in random measurement errors detectable by a Channel Operational Test (COT). One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the allowable value, the channel is considered OPERABLE. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in the CP&L setpoint methodology procedure which is based upon current Instrument Society of America (ISA) standards (Ref. 1).

When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

(continued)

BASES

BACKGROUND (continued)

RCS Vent Requirements

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be capable of relieving the flow resulting from the limiting LTOP mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

For an RCS vent to meet the flow capacity requirement, it requires removing a pressurizer safety valve, removing a PORV's internals or physically blocking the valve stem of the PORV in the open position, and disabling its block valve in the open position. The vent path(s) must be above the level of reactor coolant, so as not to drain the RCS when open.

APPLICABLE SAFETY ANALYSES

Safety analyses (Ref. 3) demonstrate that the reactor vessel is adequately protected against exceeding the Reference 1 P/T limits. In MODES 1, 2, and 3, the pressurizer safety valves will prevent RCS pressure from exceeding the Reference 1 limits. At about 350°F and below, overpressure prevention falls to two OPERABLE RCS relief valves or to a depressurized RCS and a sufficient sized RCS vent. Each of these means has a limited overpressure relief capability.

The actual temperature at which the pressure in the P/T limit curve falls below the pressurizer safety valve setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the P/T limit curves are revised, the LTOP System must be re-evaluated to ensure its functional requirements can still be met using the RCS relief valve method or the depressurized and vented RCS condition.

Any change to the RCS must be evaluated against the Reference 3 analyses to determine the impact of the change on the LTOP acceptance limits.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

Mass Input Type Transients

a. Inadvertent safety injection; or

b. Charging/letdown flow mismatch.

Heat Input Type Transients

a. Inadvertent actuation of pressurizer heaters;

b. Loss of RHR cooling; or

c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following restrictions are required during the LTOP MODES to ensure that mass and heat input transients do not occur, which either of the LTOP overpressure protection means cannot handle:

a. Rendering all but one SI pump incapable of injection with all RCS cold leg temperatures ≥ 175°F;

b. Deactivating the accumulator discharge isolation valves in their closed positions;

c. Disallowing start of an RCP if there is no steam bubble in the pressurizer, or if secondary temperature is more than 50°F above primary temperature in any one loop. LCO 3.4.6, "RCS Loops – MODE 4," and LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled," provide this protection; and

d. Rendering all SI pumps incapable of injection with any cold leg temperature < 175°F.

References 4, 5, 6, and 7 analyses demonstrate that either one RCS relief valve or the depressurized RCS and RCS vent can maintain RCS pressure below limits when the restrictions

(continued)

BASES

APPLICABLE SAFETY ANALYSES

Heat Input Type Transients (continued)

on mass and heat input described above are assumed. Thus, the LCO provides restrictions consistent with the mass and heat input assumptions of this analysis during the LTOP MODES. Since neither one RCS relief valve nor the RCS vent can handle the pressure transient need from accumulator injection, when RCS temperature is low, the LCO also requires the accumulators be isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the LTOP analyses.

The analyses did not consider the accumulators as a credible mass input mechanism because there are multiple administrative controls to ensure isolation, including de-energizing valve control circuits (Ref. 7). Therefore, the accumulators must have their discharge valves closed and the valve power supply breakers in their open positions.

The P/T Limit Curve includes an instrument uncertainty margin of 60 psig. The P/T Limit Curve does not include static head and dynamic head corrections from the reactor vessel beltline pressure to the pressure transmitter. The actual instrument uncertainty has been determined to be 45.9 psig. The combination of the instrument uncertainty and static head and dynamic head corrections, is less than the 60 psig margin in the P/T Limit Curve.

The consequences of a small break loss of coolant accident (LOCA) in LTOP MODE 4 conform to 10 CFR 50.46 and 10 CFR 50, Appendix K (Refs. 8 and 9), requirements by having a maximum of one SI pump OPERABLE and SI actuation enabled.

PORV Performance

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below 400 psig. The setpoints are derived by analyses that model the performance of the LTOP System, assuming the limiting LTOP transient of one SI pump injecting into the RCS. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or

(continued)

BASES

APPLICABLE SAFETY ANALYSES

PORV Performance (continued)

below the derived limit ensures the Reference 1 P/T limits will be met.

The PORV setpoints will be updated when the revised reactor vessel P/T limits conflict with the LTOP analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," discuss these examinations.

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

RCS Vent Performance

With the RCS depressurized, analyses show a vent size of 3 square inches is capable of mitigating the allowed LTOP overpressure transient. The capacity of a vent this size is greater than the flow of the limiting transient for the LTOP

(continued)

BASES

APPLICABLE SAFETY ANALYSES

RCS Vent Performance (continued)

configuration, one SI pump OPERABLE, maintaining RCS pressure less than the maximum pressure in the LTOP analysis.

The RCS vent size will be re-evaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

The RCS vent is passive and is not subject to active failure.

The LTOP System satisfies Criterion 2 of the NRC Policy Statement.

LCO

This LCO requires that the LTOP System be OPERABLE. The LTOP System is OPERABLE when the minimum coolant input and pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the Reference 1 limits as a result of an operational transient.

To limit the coolant input capability consistent with assumptions of the analysis, the LCO requires all accumulator discharge isolation valves closed and immobilized when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the LTOP analyses, no more than one SI pump be capable of injecting into the RCS with all RCS cold leg temperatures ≥ 175°F, and no SI pumps be capable of injecting into the RCS with any RCS cold leg temperature < 175°F.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. Two OPERABLE PORVs; or

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set to the limit required by the LTOP analyses and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits.

(continued)

BASES

LCO (continued)

b. A depressurized RCS and an RCS vent.

An RCS vent is OPERABLE when open with an area of ≥ 3 square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting LTOP transient.

APPLICABILITY

This LCO is applicable in MODE 4, MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above 350°F. When the reactor vessel head is off, overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the OPERABILITY of the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure when little or no time allows operator action to mitigate the event.

The Applicability is modified by a Note stating that accumulator isolation is only required when the accumulator pressure is more than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves. This Note permits the accumulator discharge isolation valve Surveillance to be performed only under these pressure and temperature conditions.

ACTIONS

A.1 and B.1

With two or more SI pumps capable of injecting into the RCS, and all RCS cold leg temperatures ≥ 175°F, or one or more SI pumps capable of injecting into the RCS with any cold leg temperature < 175°F, RCS overpressurization is possible.

(continued)

BASES

ACTIONS

A.1 and B.1 (continued)

To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition.

C.1, D.1, and D.2

An improperly isolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

If isolation is needed and cannot be accomplished in 1 hour, Required Action D.1 and Required Action D.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to > 350°F, an accumulator pressure of 600 psig cannot exceed the LTOP limits if the accumulators are fully injected.

Depressurizing the accumulators below the LTOP limit also gives this protection.

The Completion Times are based on operating experience that these activities can be accomplished in these time periods and on engineering evaluations indicating that an event requiring LTOP is not likely in the allowed times.

E.1

In MODE 4, with one required PORV inoperable, the PORV must be restored to OPERABLE status within a Completion Time of 7 days. Two PORVs are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

The Completion Time considers the facts that only one of the PORVs is required to mitigate an overpressure transient and that the likelihood of an active failure of the remaining valve path during this time period is very low.

(continued)

BASES

ACTIONS (continued)

F.1

The consequences of operational events that will overpressurize the RCS are more severe at lower temperature (Ref. 10). Thus, with one of the two PORVs inoperable in MODE 5 or in MODE 6 with the head on, the Completion Time to restore two valves to OPERABLE status is 24 hours.

The Completion Time represents a reasonable time to investigate and repair several types of relief valve failures without exposure to a lengthy period with only one OPERABLE PORV to protect against overpressure events.

G.1

The RCS must be depressurized and a vent must be established within 8 hours when:

a. Both required PORVs are inoperable; or

b. A Required Action and associated Completion Time of Condition A, B, D, E, or F is not met; or

c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E, or F.

The vent must be sized ≥ 3 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of one SI pump is verified capable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and locked out. In addition when any RCS cold leg temperature is < 175°F, it must be verified that no SI pumps are capable of injecting into the RCS.

The SI pump is rendered incapable of injecting into the RCS through removing the power from the pumps by racking the breakers out under administrative control. An alternate method of LTOP control may be employed using at least two independent means to prevent a pump start or to isolate the injection flow paths into the RCS such that a single failure or single action will not result in an injection into the RCS. This may be accomplished through removal of control power fuses and at least one valve in the injection flow paths being closed, or at least one valve in the injection flow paths being locked closed or closed and deenergized.

The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.1 is modified by a Note indicating that this SR is only required to be met when all RCS cold leg temperatures are ≥ 175°F. Below an RCS temperature of 175°F, all SI pumps must be incapable of injection into the RCS, as required by SR 3.4.12.2.

SR 3.4.12.2 is modified by a Note indicating that this SR is only required to be met when any RCS cold leg temperature is < 175°F. Below an RCS temperature of 175°F, all SI pumps must be incapable of injection into the RCS. Above an RCS temperature of 175°F, only one SI pump may be capable of injecting into the RCS as required by SR 3.4.12.1.

SR 3.4.12.4

The RCS vent of ≥ 3 square inches is proven OPERABLE by verifying its open condition either:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.4 (continued)

a. Once every 12 hours for a valve that cannot be locked.

b. Once every 31 days for a valve that is locked, sealed, or secured in position. A removed pressurizer safety valve fits this category.

The passive vent arrangement must only be open to be OPERABLE. This Surveillance is required to be met if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.12.a.2.

SR 3.4.12.5

The PORV block valve must be verified open every 72 hours to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

The 72 hour Frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.

SR 3.4.12.6

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ 350°F and every 31 days on each required PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the allowed maximum limits in the LTOP analyses. PORV actuation could depressurize the RCS and is not required.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.6 (continued)

The Frequency of "Once within 31 days prior to entering MODE 4, 5, or 6 when the reactor vessel head is on AND 31 days thereafter" ensures that SR 3.4.12.6 is performed prior to entry into the MODES or specified condition of the Applicability and has been proven to be acceptable based on operating experience.

SR 3.4.12.7

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required every 18 months to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

REFERENCES

1. 10 CFR 50, Appendix G.

2. Generic Letter 88-11.

3. UFSAR, Chapter 5.

4. Letter, RNP-RA/96-0141, CP&L (R. M. Krich) to NRC, "Request for Technical Specifications Change, Conversion to Improved Standard Technical Specifications Consistent with NUREG-1431, 'Standard Technical Specifications-Westinghouse Plants,' Revision 1," August 30, 1996, Enclosure 5.

5. Letter, NG-77-1215, CP&L (B. J. Furr) to NRC (R. W. Reid), "Reactor Vessel Overpressurization Protection," October 31, 1977.

6. Letter, NG-77-1426, CP&L (E. E. Utley) to NRC (R. W. Reid), "Response to Overpressure Protection System Questions," December 15, 1977.

7. Report, "Pressure Mitigating Systems Transient Analysis Results," prepared by Westinghouse Electric Corporation for the Westinghouse Owners Group on Reactor Coolant System Overpressurization, July 1977, and Supplement, September 1977.

(continued)

BASES

REFERENCES (continued)

8. 10 CFR 50, Section 50.46.

9. 10 CFR 50, Appendix K.

10. Generic Letter 90-06.

Page Insertion Instructions for inserting pages into Enclosure 21 to Serial: RNP-RA/96-0141, dated August 27, 1996, "Compilation of CTS pages."

Remove Page	Insert Page
3.1-4(3.4.12), 3.1-4a(3.4.12)	3.1-4(3.4.12), 3.1-4a(3.4.12)
3.3-5(3.4.12), 4.1-13(3.4.12)	3.3-5(3.4.12), 4.1-13(3.4.12)
4.1-7a(3.4.12),4.2-7a(3.4.12)	4.1-7a(3.4.12),4.2-7a(3.4.12)

ITS

A1

3.1.2 Heatup and Cooldown

3.1.2.1 The reactor coolant pressure and the system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figure 3.1-1 and Figure 3.1-2 (for vessel exposure up to 24 EFPY). These limitations are as follows:

a. Over the temperature range from cold shutdown to hot operating conditions, the heatup rate shall not exceed 60°F/hr. in any one hour.

See 3.4.3

b. Allowable combinations of pressure and temperature for a specific cooldown rate are below and to the right of the limit lines for that rate as shown on Figure 3.1-2. This rate shall not exceed 100°F/hr. in any one hour. The limit lines for cooling rates between those shown in Figure 3.1-2 may be obtained by interpolation.

c. Primary system hydrostatic leak tests may be performed as necessary, provided the temperature limitation as noted on Figure 3.1-1 is not violated. Maximum hydrostatic test pressure should remain below 2350 psia.

[LCO 3.4.12.a.1] d. The overpressure protection system shall be OPERABLE[1], with both power operated relief valves OPERABLE with a lift setting of less than or equal to 420 psi whenever any RCS

A9

M35

400 psig and an allowable value of ≤ 408

[1] The overpressure protection system shall not be considered inoperable solely because either the normal or emergency power source for the PORV block valves is inoperable.

A8

Supplement 3

A1

[LCO 3.4.12.a.1] cold leg temperature is less than or equal to 350°F, and when the head is on the reactor vessel and the RCS is not vented to the containment.

[ACTION E] 1. With one PORV inoperable and T_{avg} greater than 200°F and any RCS cold leg temperature less than 350°F:

A. Restore the inoperable PORV to OPERABLE status within 7 days; or

[ACTION G] B. Depressurize and vent the RCS to the CV within the next ~~12~~ 8 hours.

[ACTION F] 2. With one PORV inoperable and T_{avg} less than or equal to 200°F:

A. Restore the inoperable PORV to OPERABLE status within 24 hours; or

[ACTION G] B. Complete depressurization and venting of the RCS to the CV within an additional ~~12~~ 8 hours.

[ACTION G] 3. With both PORVs inoperable, complete depressurization and venting of the RCS to the CV within ~~12~~ 8 hours. M24

[SR 3.4.12.4] [NOTE] 4. With the RCS vented per 1, 2, or 3, verify the vent pathway:

A. At least once per 31 days when the pathway is provided by a valve(s) that is locked, sealed, or otherwise secured in the open position; or

B. At least once per ~~shift~~ 12 hours.

Add LCO 3.4.12.b
Add Applicability "NOTE"
ACTIONS A, B, C, D
SR 3.4.12.1
SR 3.4.12.2
SR 3.4.12.3

M25

Add LCO 3.4.12.d

A23

Add LCO 3.4.12.a.2

M37

Specification 3.4.12

ITS

A1

3.3.1.3 When the reactor is in the hot shutdown condition, the requirements of 3.3.1.1 and 3.3.1.2 shall be met. Except that the accumulators may be isolated or otherwise inoperable relative to the requirements of 3.3.1.1.b. In addition, any one component as defined in 3.3.1.2 may be inoperable for a period equal to the time period specified in the subparagraphs of 3.3.1.2 plus 48 hours, after which the plant shall be placed in the cold shutdown condition utilizing normal operating procedures. The safety injection pump power supply breakers must be racked out when the reactor coolant system temperature is below 350°F and the system is not vented to containment atmosphere.

See 3.5.1, 3.5.2, 3.5.3 & 3.5.4

All but one

L8

with the RCS temperature ≥175°

[LCO 3.4.12.c]

3.3.1.4 When the reactor is in the cold shutdown condition (except refueling operation when Specification 3.8.1.e applies), both residual heat removal loops must be operable. Except that either the normal or emergency power source to both residual heat removal loops may be inoperable.

MODE 4, 5, 6 (head on)

M26

3.4.7
3.4.8

a. If one residual heat removal loop becomes inoperable during cold shutdown operation, within 24 hours verify the existence of a method to add make-up water to the reactor coolant system such as charging pumps, safety injection pumps (under adequate operator control to prevent system overpressurization), or primary water (if the reactor coolant system is open for maintenance) as back-up decay heat removal method. Restore the inoperable RHR loop to operable status within 14 days or prepare and submit a Special Report to the Commission within the next 30 days outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the loop to operable status.

b. If both residual heat removal loops become inoperable during cold shutdown operation, close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere prior to the reactor coolant average temperature exceeding 200°F, restore at least one residual

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Specification 3.4.12

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A11

TABLE 4.1-3 (Continued)
FREQUENCIES FOR EQUIPMENT TESTS

		Check	Frequency	Maximum Time Between Test
13.	Deleted			
14.	Fans and associated charcoal and Absolute Filters for Residual Heat Removal Compartments (HVE-5a and 5b)	Fans functioning. Laboratory tests on charcoal must show ≥ 99% iodine removal. In-place test must show ≥ 99% removal of polydispersed DOP particles by the HEPA filters and Freon by the charcoal filters.	Once per operating cycle.	NA
15.	Isolation Seal Water System	Functioning	Each refueling shutdown	NA
[SR 3.4.12.7] 16.	Overpressure Protection System	Functioning	Each refueling shutdown	NA
17.	Primary Coolant System check valves	Functioning	1. Periodic leakage testing[a][b] on each [c]valve listed in Table 3.1-1 shall be accomplished prior to entering reactor operation condition (1) after every time the plant is placed in the cold shutdown condition for refueling, (2) after each time the plant is placed in a cold shutdown condition for 72 hours if testing has not been accomplished in the preceding 9 months, (3) after maintenance, repair or replacement work is performed.	

LA8

18 MO

See 3.6.8

See 3.4.14

[a] To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

[b] Minimum test differential pressure shall not be less than 150 psid.

[c] More than one valve may be tested in parallel. The combined leakage shall not exceed 5.0 gpm. Redundant valves in each line shall not be tested in series.

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TABLE 4.1-1 (Continued)

	Channel Description	Check	Calibrate	Test		Remarks
30.	Reactor Trip Breakers	N.A.	N.A..	M(1)	(1)	The reactor trip breaker trip actuating device operational test shall verify the operability of the UV trip attachment and the shunt trip attachment, individually.
[SR3.4.12.6] [SR3.4.12.7] 31.	Overpressure Protection System	~~N.A.~~	~~R~~ 18 months	~~M~~ 31 days		

See 3.3.1

Specification 3.4.12

A1

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ITS

A1

c. Operating the solenoid air control valves and check valves for their associated accumulators in PORV control systems through one complete cycle of full travel or function testing of individual components.

4.2.4.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed in order to meet the requirements of Specification 3.1.1.5.b. or c. See 3.4.11

4.2.4.3 The accumulator for the PORVs shall be demonstrated OPERABLE at each refueling by isolating the normal air and nitrogen supplies and operating the valves through a complete cycle of full travel.

4.2.5 Low-Temperature Overpressure Protection

4.2.5.1 Each PORV shall be demonstrated OPERABLE by:

[SR 3.4.12.6] a. Performance of an ANALOG CHANNEL OPERATIONAL TEST on the actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE; and

[SR 3.4.12.7] b. Performance of a CHANNEL CALIBRATION at ~~each refueling shutdown~~ 18 months; and

[SR 3.4.12.5] c. Verifying the PORV block valve is open at least once per 72 hours when the PORV is being used for overpressure protection.