ENCLOSURE 2

VOLUME 10

TURKEY POINT NUCLEAR GENERATING STATION UNIT 3 AND UNIT 4

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

Revision 0

LIST OF ATTACHMENTS

1. ITS 3.5.1 – Accumulators
2. ITS 3.5.2 – ECCS – Operating
3. ITS 3.5.3 – ECCS – Shutdown
4. ITS 3.5.4 – Refueling Water Storage Tank (RWST)
5. Relocated/Deleted Current Technical Specifications (CTS)
6. ISTS Not Adopted

ATTACHMENT 1

ITS 3.5.1, ACCUMULATORS

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

LIMITING CONDITION FOR OPERATION

LCO 3.5.1 3.5.1 ~~Each Reactor Coolant System (RCS)~~ Three ECCS accumulator**s** shall be OPERABLE. A02 A01

Applicability APPLICABILITY: MODES 1, 2, and 3*.

ACTION:

ACTION B a. With one accumulator inoperable, except as a result of boron concentration not being within limits, restore the inoperable accumulator to OPERABLE status within ~~1~~ 24 hour**s** or be in at

ACTION C least HOT STANDBY within the next 6 hours and reduce pressurizer pressure ~~to less than~~ ≤ 1000 psig within the following 6 hours. L01 A01 L02

ACTION A b. With one accumulator inoperable due to the boron concentration not being within the limits, restore boron concentration back to the required limits within 72 hours, or be in at least

ACTION C HOT STANDBY within 6 hours and reduce pressurizer pressure ~~to less than~~ ≤ 1000 psig within the following 6 hours. L02

Add proposed ACTION D A03

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

SR 3.5.1.2 1) Verifying the borated water volume in each accumulator is ~~between~~ greater than or equal to 6520 and less than or equal to 6820 gallons, and M02

SR 3.5.1.3 2) Verifying that the nitrogen cover pressure in each accumulator is ~~between~~ greater than or equal to 600 and less than or equal to 675 psig, and M03

SR 3.5.1.1 3) Verifying that each accumulator isolation valve is open ~~by control room indication (power may be restored to the valve operator to perform this surveillance if redundant indicator is inoperable).~~ LA01

Applicability *Pressurizer pressure above 1000 psig. A01

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

that is not the result of addition from the refueling water storage tank

L03

SR 3.5.1.4

b. In accordance with the Surveillance Frequency Control Program and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the solution in the water-filled accumulator is ~~between~~ 2300 and 2600 ppm;

M04

greater than or equal to

less than or equal to

SR 3.5.1.5

c. In accordance with the Surveillance Frequency Control Program, when the RCS pressure is ~~above~~ 1000 psig, by verifying that the power to the isolation valve operator is disconnected by a locked open breaker.

M01

greater than or equal to

d. Deleted

DISCUSSION OF CHANGES
ITS 3.5.1, ACCUMULATORS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.5.1 requires "each" cold leg injection accumulator to be OPERABLE. ITS Limiting Condition for Operation (LCO) 3.5.1 requires "three" Emergency Core Cooling System (ECCS) accumulators to be OPERABLE. This changes the CTS by specifying the exact number of ECCS accumulators required to be OPERABLE.

The change is acceptable because the total number of ECCS accumulators in each unit at PTN is three. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS 3.5.1 does not contain a specific ACTION for two or more accumulators inoperable. With two or more accumulators inoperable, CTS 3.0.3 would be entered. ITS 3.5.1 ACTION D directs entry into LCO 3.0.3 when two or more accumulators are inoperable. This changes the CTS by specifically stating to enter LCO 3.0.3 in this System Specification.

This change is acceptable because the action taken when two or more accumulators are inoperable is unchanged. Adding this ACTION is consistent with the ITS convention of directing entry into LCO 3.0.3 when multiple ACTIONS are presented in the ITS, and entry into these multiple ACTIONS could result in a loss of safety function. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS SR 4.5.1.1 states "when the RCS pressure is above 1000 psig, by verifying that the power to the isolation valve operator is disconnected by a locked open breaker." Above means greater than. ITS Surveillance Requirement (SR) 3.5.1.5 states "Verify power is removed from each accumulator isolation valve operator when Reactor Coolant System (RCS) pressure is ≥ 1000 psig." This changes the CTS by verifying power is removed from each accumulator isolation valve operator when Reactor Coolant System (RCS) pressure is greater than or equal to 1000 psig instead of just greater than 1000 psig.

The purpose of the proposed CTS SR 4.5.1.1 and ITS SR 3.5.1.5 is to verify that power is removed from each accumulator isolation valve operator when the RCS pressure is above (greater than) 1000 psig. This change is acceptable because it ensures that an active failure could not result in the undetected closure of an

accumulator motor operated isolation valve. If this were to occur, only two accumulators would be available for injection given a single failure coincident with a Loss of Coolant Accident (LOCA). This change is designated as more restrictive because it requires equal to a value of 1000 psig versus just greater than 1000 psig.

M02 CTS SR 4.5.1.1.a.1 states "Verifying the borated water volume in each accumulator is between 6520 and 6820 gallons," and ITS SR 3.5.1.2 states "Verify borated water volume in each accumulator is ≥ 6520 gallons and ≤ 6820 gallons." This changes the CTS by including the outer limits in the verification (by adding equal values).

The purpose of the proposed CTS SR 4.5.1.1.a.1 and ITS SR 3.5.1.2 is to verify borated water volume in each accumulator. This change is acceptable because including the outer limit values in the verification does not affect the purpose of the SR to verify that the equipment used to meet the LCO can perform its specified safety functions. The change is a measurement change to include equal values. This change is designated as more restrictive because more stringent requirements are being applied in the ITS than were applied in the CTS.

M03 CTS SR 4.5.1.1.a.2 states "Verifying the nitrogen cover pressure in each accumulator is between 600 and 675 psig," and ITS SR 3.5.1.3 states "Verify nitrogen cover pressure in each accumulator is ≥ 600 psig and ≤ 675 psig." This changes the CTS by including the outer limits in the verification (by adding equal values).

The purpose of the proposed CTS SR 4.5.1.1.a.2 and ITS SR 3.5.1.3 is to verify nitrogen cover pressure in each accumulator. This change is acceptable because including the outer limit values in the verification does not affect the purpose of the SR to verify that the equipment used to meet the LCO can perform its specified safety functions. The change is a measurement change to include equal values. This change is designated as more restrictive because more stringent SR requirements are being applied in the ITS than were applied in the CTS.

M04 CTS SR 4.5.1.1.b states "by verifying the boron concentration of the solution in the water-filled accumulator is between 2300 and 2600 ppm," and ITS SR 3.5.1.4 states "Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2600 ppm." This changes the CTS by including the outer limits in the verification (by adding equal values).

The purpose of the proposed CTS SR 4.5.1.1.b and ITS SR 3.5.1.4 is to verify boron concentration in each accumulator. This change is acceptable because including the outer limit values in the verification does not affect the purpose of the SR to verify that the equipment used to meet the LCO can perform its required functions. The change is a measurement change to include equal values. This change is designated as more restrictive because more stringent SRs are being applied in the ITS than were applied in the CTS.

DISCUSSION OF CHANGES
ITS 3.5.1, ACCUMULATORS

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS SR 4.5.1.1 states "Verifying that each accumulator isolation valve is open by control room indication (power may be restored to the valve operator to perform this surveillance if redundant indicator is inoperable)." ITS SR 3.5.1.1 does not contain this statement. This changes the CTS by not including control room power indication for accumulator isolation valve to be open.

The removal of control room indication (power may be restored to the valve operator to perform this surveillance if redundant indicator is inoperable) for verifying that each accumulator isolation valve is open from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications in order to provide adequate protection of public health and safety. The ITS retains the requirement to verify that each accumulator isolation valve is open. Also, this change is acceptable because these types of procedural details will be adequately controlled in the Technical Specification Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because a [describe what is being removed] is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.5.1 ACTION a states, in part, "inoperable accumulator to OPERABLE status within 1 hour." ITS 3.5.1 ACTION B.1 states "Restore accumulator to OPERABLE status within 24 hours." This changes the CTS by increasing the Completion Time from 1 hour to 24 hours.

The purpose of ITS 3.5.1 ACTION B.1 is to restore the operability of an accumulator. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a Design Basis Accident (DBA) occurring during the allowed Completion Time. WCAP-15049-A provides additional justification for the 24-hour Completion Time. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.5.1 Required Action b states "reduce pressurizer pressure to less than 1000 psig within the following 6 hours." ITS 3.5.1 Required Action C.2 states, "Reduce RCS pressure to ≤ 1000 psig within the following 6 hours." This changes the CTS by adding “or equal to” to less than 1000 psig.

The purpose of CTS 3.5.1 Required Action b is to restore one accumulator inoperable due to the boron concentration not being within the limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The change to the CTS is adding "or equal to" to less than 1000 psig. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS SR 3.5.1.1 b states "within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume." ITS SR 3.5.1.4 states "Once within 6 hours after each solution volume increase of 1% of tank volume that is not the result of addition from the refueling water storage tank." This changes the CTS by stating tank volume that is not the result of addition from the refueling water storage tank (RWST).

The purpose of ITS SR 3.5.1.4 is to verify boron concentration in each accumulator. This change is acceptable because it has been determined that the relaxed SR acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. It is not necessary to verify boron concentration if the added water inventory is from the RWST) because the water contained in the RWST is within the accumulator boron concentration requirements. This change is designated as less restrictive because less stringent SRs are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1.1

LCO 3.5.1 Three [~~Four~~] ECCS accumulators shall be OPERABLE. 1

Applicability

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION b A. One accumulator inoperable due to boron concentration not within limits.	A.1 Restore boron concentration to within limits.	72 hours
ACTION a B. One accumulator inoperable for reasons other than Condition A.	B.1 Restore accumulator to OPERABLE status.	24 hours
ACTION a ACTION b C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Reduce RCS pressure to ≤ [~~1000~~] psig.	6 hours 12 hours 1
DOC A03 D. Two or more accumulators inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.5.1.1.a.3	SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.5.1.1.a.1	SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ ~~[7853~~ gallons ~~( )%~~ and ≤ ~~8171~~ gallons ~~( )%]~~. (6520) (6820)	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.5.1.1.a.2	SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ ~~[385]~~ psig and ≤ ~~[481]~~ psig. (600) (675)	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
4.5.1.1.b	SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ ~~[1900]~~ 2300 ppm and ≤ ~~[2100]~~ 2600 ppm.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ AND --------NOTE-------- Only required to be performed for affected accumulators ---------- Once within 6 hours after each 1 % of tank volume solution volume increase of ≥ ~~[[ ] gallons, ( )% of indicated level]~~ that is not the result of addition from the refueling water storage tank
4.5.1.1.c	SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is ≥ ~~[2000]~~ 1000 psig.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.1, ACCUMULATORS

1. The Improved Standard Technical Specifications (ISTS) contain bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.1 Accumulators

BASES

BACKGROUND

The functions of the ECCS accumulators are to supply water to the reactor vessel during the blowdown phase of a loss of coolant accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA.

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

In the refill phase of a LOCA, which immediately follows the blowdown phase, reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of accumulator inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer so as to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of safety injection (SI) water.

The accumulators are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The accumulators are passive components, since no operator or control actions are required in order for them to perform their function. Internal accumulator tank pressure is sufficient to discharge the accumulator contents to the RCS, if RCS pressure decreases below the accumulator pressure.

Each accumulator is piped into an RCS cold leg via an accumulator line and is isolated from the RCS by a motor operated isolation valve and two check valves in series.

three
two

The accumulator size, water volume, and nitrogen cover pressure are selected so that ~~three~~ of the ~~four~~ accumulators are sufficient to partially cover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that ~~three~~ accumulators are adequate for this function is consistent with the LOCA assumption that the entire contents of one accumulator will be lost via the RCS pipe break during the blowdown phase of the LOCA.

two

1

BASES

APPLICABLE SAFETY ANALYSES

The accumulators are assumed OPERABLE in both the large and small break LOCA analyses at full power (Ref. 1). These are the Design Basis Accidents (DBAs) that establish the acceptance limits for the accumulators. Reference to the analyses for these DBAs is used to assess changes in the accumulators as they relate to the acceptance limits.

In performing the LOCA calculations, conservative assumptions are made concerning the availability of ECCS flow. In the early stages of a LOCA, with or without a loss of offsite power, the accumulators provide the sole source of makeup water to the RCS. The assumption of loss of offsite power is required by regulations and conservatively imposes a delay wherein the ECCS pumps cannot deliver flow until the emergency diesel generators start, come to rated speed, and go through their timed loading sequence. In cold leg break scenarios, the entire contents of one accumulator are assumed to be lost through the break.

The limiting large break LOCA is a double ended guillotine break at the discharge of the reactor coolant pump. During this event, the accumulators discharge to the RCS as soon as RCS pressure decreases to below accumulator pressure.

As a conservative estimate, no credit is taken for ECCS pump flow until an effective delay has elapsed. This delay accounts for the diesels starting and the pumps being loaded and delivering full flow. The delay time is conservatively set with an additional 2 seconds to account for SI signal generation. During this time, the accumulators are analyzed as providing the sole source of emergency core cooling. No operator action is assumed during the blowdown stage of a large break LOCA.

The worst case small break LOCA analyses also assume a time delay before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated solely by the accumulators, with pumped flow then providing continued cooling. As break size decreases, the accumulators and ~~centrifugal charging~~ pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the accumulators continues to decrease until they are not required and the ~~centrifugal charging~~ pumps become solely responsible for terminating the temperature increase.

SI 1

SI 1

This LCO helps to ensure that the following acceptance criteria established for the ECCS by 10 CFR 50.46 (Ref. 2) will be met following a LOCA:

BASES

APPLICABLE SAFETY ANALYSES (continued)

a. Maximum fuel element cladding temperature is ~~≤~~ < 2200°F,

b. Maximum cladding oxidation is ~~≤~~ 0.17 times the total cladding thickness before oxidation,

c. Maximum hydrogen generation from a zirconium water reaction is ~~≤~~ 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react, and

d. Core is maintained in a coolable geometry.

Since the accumulators discharge during the blowdown phase of a LOCA, they do not contribute to the long term cooling requirements of 10 CFR 50.46.

break LOCA analysis a range of water volume values are used

for the

For ~~both~~ the large and small break LOCA analyses~~,~~ a nominal ~~contained~~ accumulator water volume is used. The contained water volume is the same as the deliverable volume for the accumulators, since the accumulators are emptied, once discharged. ~~For small breaks, an increase in water volume is a peak clad temperature penalty. For large breaks, an increase in water volume can be either a peak clad temperature penalty or benefit, depending on downcomer filling and subsequent spill through the break during the core reflooding portion of the transient.~~ The analysis makes a conservative assumption with respect to ignoring or taking credit for line water volume from the accumulator to the check valve. The safety analysis assumes values of ~~[6468] gallons and [6879] gallons~~ between 872 ft^3 and 920 ft^3 for the large break LOCA and 892 ft^3 for the small break LOCA. ~~To allow for instrument inaccuracy, values of [6520] gallons and [6820] gallons are specified.~~

The minimum boron concentration setpoint is used in the post LOCA boron concentration calculation. The calculation is performed to assure reactor subcriticality in a post LOCA environment. Of particular interest is the large break LOCA, since no credit is taken for control rod assembly insertion. A reduction in the accumulator minimum boron concentration would produce a subsequent reduction in the available containment sump concentration for post LOCA shutdown and an increase in the maximum sump pH. The maximum boron concentration is used in determining the cold leg to hot leg recirculation injection switchover time and minimum sump pH.

BASES

APPLICABLE SAFETY ANALYSES (continued)

break LOCA analyses are performed using a range of nitrogen cover pressures (575 psig to 700 psig)

a

The large and small break LOCA analyses are performed at ~~the minimum~~ nitrogen cover pressure, since sensitivity analyses have demonstrated that higher nitrogen cover pressure results in a computed peak clad temperature benefit. The maximum nitrogen cover pressure limit prevents accumulator relief valve actuation, and ultimately preserves accumulator integrity.

of 575 psig.

1

The effects on containment mass and energy releases from the accumulators are accounted for in the appropriate analyses (Ref~~s~~. ~~1 and~~ 3).

1

The accumulators satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO establishes the minimum conditions required to ensure that the accumulators are available to accomplish their core cooling safety function following a LOCA. ~~Four~~ accumulators are required to ensure that 100% of the contents of ~~three~~ of the accumulators will reach the core during a LOCA. This is consistent with the assumption that the contents of one accumulator spill through the break. If less than ~~three~~ accumulators are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 2) could be violated.

Three

two

two

1

1

For an accumulator to be considered OPERABLE, the isolation valve must be fully open, power removed above ~~[2000]~~ psig, and the limits established in the SRs for contained volume, boron concentration, and nitrogen cover pressure must be met.

1000

2

APPLICABILITY

In MODES 1 and 2, and in MODE 3 with RCS pressure > 1000 psig, the accumulator OPERABILITY requirements are based on full power operation. Although cooling requirements decrease as power decreases, the accumulators are still required to provide core cooling as long as elevated RCS pressures and temperatures exist.

This LCO is only applicable at pressures > 1000 psig. At pressures ≤ 1000 psig, the rate of RCS blowdown is such that the ECCS pumps can provide adequate injection to ensure that peak clad temperature remains below the 10 CFR 50.46 (Ref. 2) limit of 2200°F.

In MODE 3, with RCS pressure ≤ 1000 psig, and in MODES 4, 5, and 6, the accumulator motor operated isolation valves are closed to isolate the accumulators from the RCS. This allows RCS cooldown and depressurization without discharging the accumulators into the RCS or requiring depressurization of the accumulators.

BASES

ACTIONS

A.1

If the boron concentration of one accumulator is not within limits, it must be returned to within the limits within 72 hours. In this Condition, ability to maintain subcriticality or minimum boron precipitation time may be reduced. The boron in the accumulators contributes to the assumption that the combined ECCS water in the partially recovered core during the early reflooding phase of a large break LOCA is sufficient to keep that portion of the core subcritical. One accumulator below the minimum boron concentration limit, however, will have no effect on available ECCS water and an insignificant effect on core subcriticality during reflood. Boiling of ECCS water in the core during reflood concentrates boron in the saturated liquid that remains in the core. In addition, ~~current analysis techniques demonstrate that~~ the accumulators ~~do not~~ discharge following a large main steam line break ~~for the majority of plants~~. ~~Even if they do discharge, their impact is minor and not a design limiting event.~~ Thus, 72 hours is allowed to return the boron concentration to within limits.

Their impact is minor since the use of the accumulator volume compensates for RCS shrinkage.

only a small amount

1

B.1

If one accumulator is inoperable for a reason other than boron concentration, the accumulator must be returned to OPERABLE status within 24 hours. In this Condition, the required contents of ~~three~~ two accumulators cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 24 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable accumulator to OPERABLE status. The Completion Time minimizes the potential for exposure of the plant to a LOCA under these conditions. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified in WCAP-15049-A, Rev. 1 (Ref. 4).

1

C.1 and C.2

If the accumulator cannot be returned to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 6 hours and RCS pressure reduced to ≤ 1000 psig 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.

BASES

ACTIONS (continued)

D.1

If more than one accumulator is inoperable, the plant is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator valve should be verified to be fully open. This verification ensures that the accumulators are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in not meeting accident analyses assumptions. ~~[The Frequency of 12 hours is considered reasonable in view of other administrative controls that ensure a mispositioned isolation valve is unlikely.~~

2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~---------- REVIEWER'S NOTE ----------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~----------]~~

3

SR 3.5.1.2 and SR 3.5.1.3

Verification of Accumulator volume and nitrogen cover pressure may be verified by any valid means, not just by instrumentation.

Borated water volume and nitrogen cover pressure are verified for each accumulator. ~~[The Frequency of 12 hours is sufficient to ensure adequate injection during a LOCA. Because of the static design of the accumulator, a 12 hour Frequency usually allows the operator to identify changes before limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.~~

1

2

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~[REVIEWER'S NOTE~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~]~~

3

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator since the static design of the accumulators limits the ways in which the concentration can be changed. ~~[The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage.~~

2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~[REVIEWER'S NOTE~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~]~~

3

Sampling the affected accumulator within 6 hours after a 1% volume increase will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the refueling water storage tank (RWST), because the water contained in the RWST is within the accumulator boron concentration requirements. This is consistent with the recommendation of NUREG-1366 (Ref. 5).

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5

Verification that power is removed from each accumulator isolation valve operator when the RCS pressure is ≥ ~~[2000]~~ psig ensures that an active failure could not result in the undetected closure of an accumulator motor operated isolation valve. If this were to occur, only two accumulators would be available for injection given a single failure coincident with a LOCA. ~~[Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that power is removed.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~----------REVIEWER'S NOTE----------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~----------]~~

This SR allows power to be supplied to the motor operated isolation valves when RCS pressure is < ~~2000~~ psig, thus allowing operational flexibility by avoiding unnecessary delays to manipulate the breakers during plant startups or shutdowns.

REFERENCES

1. FSAR, Chapter ~~[~~6~~]~~.
2. 10 CFR 50.46.
3. FSAR, Chapter ~~[~~15~~]~~.
4. WCAP-15049-A, Rev. 1, April 1999.
5. NUREG-1366, February 1990.

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.1 BASES, ACCUMULATORS

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.5.1, ACCUMULATORS

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 2

ITS 3.5.2, ECCS - OPERATING

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

EMERGENCY CORE COOLING SYSTEMS

3/4.5.2 ECCS SUBSYSTEMS - T_{avg} GREATER THAN OR EQUAL TO 350°F

LIMITING CONDITION FOR OPERATION

LCO 3.5.2

3.5.2 ~~The following~~ Emergency Core Cooling System (ECCS) equipment and flow paths shall be OPERABLE:

~~a. Four Safety Injection (SI) pumps, each capable of being powered from its associated OPERABLE diesel generator#, with discharge flow paths aligned to the RCS cold legs,~~*

~~b. Two RHR heat exchangers,~~

~~c. Two RHR pumps with discharge flow paths aligned to the RCS cold legs,~~

~~d. A flow path capable of taking suction from the refueling water storage tank as defined in Specification 3.5.4, and~~

~~e. Two flow paths capable of taking suction from the containment sump.~~

Applicability

APPLICABILITY: MODES 1, 2, and 3**

ACTION:

Action A

a. With one of the following components inoperable:

1. RHR heat exchanger,
2. RHR suction flow path from the containment sump,
3. RHR parallel injection flow path, or
4. SI parallel injection flow path

Action H

Restore the inoperable component to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. Deleted

Action B

Action I

c. With one of the four required Safety Injection pumps or its associated discharge flow path inoperable and the opposite unit in MODE 1, 2, or 3, restore the pump or flow path to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 12 hours and in HOT SHUTDOWN within the following 6 hours.

LCO Note 1

*Only three Safety Injection (SI) pumps (two associated with the unit and one from the opposite unit), ~~each capable of being powered from its associated OPERABLE diesel generator#, with discharge flow paths aligned to the RCS cold leg are required~~ if the opposite unit is in MODE 4, 5, 6 or defueled.

LCO Note 2

**~~The provisions of Specification 4.0.4 are not applicable for~~ entry into MODE 3 for the Safety Injection flow paths isolated pursuant to Specification 3.4.9.3 provided that the Safety Injection flow paths are restored to OPERABLE status prior to Tavg exceeding 380°F. Safety Injection flow paths may be isolated when Tavg is less than 380°F.

~~#Inoperability of the required diesel generators does not constitute inoperability of the associated Safety Injection pumps.~~

3/4.5.2 ECCS SUBSYSTEMS - T_{avg} GREATER THAN OR EQUAL TO 350°F

LIMITING CONDITION FOR OPERATION

Action C

d. With two of the four required Safety Injection pumps or their associated discharge flow paths inoperable and the opposite unit in MODE 1, 2, or 3, restore one of the two inoperable pumps or flow paths to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 12 hours and in HOT SHUTDOWN within the following 6 hours. This ACTION applies to both units simultaneously.

LA05

A03

Action I

Action B & C Note

Action D

LCO Note 1

Action H

e. With one of the three required Safety Injection pumps or its associated discharge flow path inoperable and the opposite unit in MODE 4, 5, 6, or defueled, restore the pump or flow path to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

LA05

Action E

Action H

f. With a required Safety Injection pump OPERABLE but not capable of being powered from its associated diesel generator, restore the capability within 14 days or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

Action F

Action H

g. With an ECCS subsystem inoperable due to an RHR pump or its associated discharge flow path being inoperable, restore the inoperable RHR pump or its associated discharge flow path to OPERABLE status within 7 days or in accordance with the Risk Informed Completion Time Program, or be in as least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

LA05

Action G

Action H

h. With the suction flow path from the refueling water storage tank inoperable, restore the suction flow path to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

4.5.2 Each ECCS component and flow path shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying by control room indication that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
864A and B	Supply from RWST to ECCS	Open
862A and B	RWST Supply to RHR pumps	Open
863A and B	RHR Recirculation	Closed
866A and B	H.H.S.I. to Hot Legs	Closed
HCV-758*	RHR HX Outlet	Open

SR 3.5.2.1 Note

To permit positive valve position indication for surveillance or maintenance purposes in the event that continuous valve position indication is unavailable in the control room, power may be restored to these valves for a period not to exceed 1 hour.

b. In accordance with the Surveillance Frequency Control Program by:

SR 3.5.2.3

1) Verifying ECCS locations susceptible to gas accumulation are sufficiently filled with water, and

SR 3.5.2.2

2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.**

SR 3.5.2.4

c. By verifying that each SI and RHR pump's developed head at the test flow point is greater than or equal to the required developed head when tested in accordance with the INSERVICE TESTING PROGRAM.

~~*Air Supply to HCV-758 shall be verified shut off and sealed closed in accordance with the Surveillance Frequency Control Program.~~

LA03

SR 3.5.2.2 Note

**Not required to be met for system vent flow paths opened under administrative control.

A01

ITS 3.5.2

Figure 3.5-1
DELETED

ITS

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS

~~d. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. The visual inspection shall be performed:~~ LA06

~~1) For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and~~

~~2) At least once daily of the areas affected within containment by containment entry and during the final entry when CONTAINMENT INTEGRITY is established.~~

e. In accordance with the Surveillance Frequency Control Program by:

SR 3.5.2.8

1) Verifying automatic isolation and interlock action of the RHR system from the Reactor Coolant System by ensuring that with a simulated or actual Reactor Coolant System pressure signal greater than or equal to 525 psig the interlocks cause the valves to automatically close and prevent the valves from being opened, and

SR 3.5.2.8

2) Verifying correct interlock action to ensure that the RWST is isolated from the RHR System during RHR System operation and to ensure that the RHR System cannot be pressurized from the Reactor Coolant System unless the above RWST Isolation Valves are closed.

SR 3.5.2.9

3) A visual inspection of the containment sump and verifying that the suction inlets are not restricted by debris and that the sump components ~~(trash racks, screens, etc.)~~ show no evidence of structural distress or abnormal corrosion. LA07

f. In accordance with the Surveillance Frequency Control Program, during shutdown, by:

SR 3.5.2.5

1) Verifying that each automatic valve in the flow path actuates to its correct position on Safety Injection actuation test signal, and

SR 3.5.2.6

2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection actuation test signal:

~~a) Safety Injection pump, and~~

~~b) RHR pump.~~ LA04

ITS

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS

SR 3.5.2.7

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

~~1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS components are required to be OPERABLE, and~~

L01

2) In accordance with the Surveillance Frequency Control Program.

RHR System Valve Number
HCV-*-758
MOV-*-872

DISCUSSION OF CHANGES
ITS 3.5.2, ECCS - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.5.2 Applicability Footnote ** contains the provision that Specification 4.0.4 is not applicable for entry into MODE 3 and also contains an allowance to operate in MODE 3 with the safety injection flow paths isolated as long as Tavg ≤ 380 °F. ITS 3.5.2 contains a similar Note but it is located in the Limiting Condition for Operation (LCO) and does not contain the Specification 4.0.4 exception. This changes the CTS by not adopting the Specification 4.0.4 exception.

This CTS Applicability footnote allows entry into MODE 3 and operation in MODE 3 without meeting the Surveillance Requirement (SR). This portion of the Note allows continuous operation in MODE 3 as long as Tavg does not exceed 380ºF. The ITS moves the Note to the LCO and instead of stating Specification 4.0.4 is not applicable, the Note states that entry into and operation in MODE 3 is allowed. The allowances provided by the CTS and ITS accomplish equivalent results; both allow entry into and operation in MODE 3 at temperatures below 380 °F. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS 3.5.2 ACTION d (two Safety Injection (SI) Pumps inoperable with the opposite unit in MODES 1, 2, and 3) contains a statement that the ACTIONS apply to both units simultaneously. The ITS also contains the note for the same Action and also adds the Note to ACTION C (when one SI pump is inoperable). This changes the CTS by adding this directive to an additional ACTION.

This change is acceptable because, while not explicitly stated, both units are required to enter the ACTION simultaneously when one Safety Injection pump is inoperable. There is a total of four SI pumps shared between the two units and all four SI pumps are required to be OPERABLE for both units when both units are operating in MODES 1, 2, or 3. Therefore, if one SI pump is inoperable, neither unit has the required number of SI pumps and the ITS Action for one pump inoperable would be entered for both units. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program,* ISI Program, or Surveillance Frequency Control Program) CTS 3.5.2 lists the components and flow paths required to be OPERABLE in the LCO. ITS 3.5.2 does not list the components and flow paths in the LCO. This changes the CTS by removing Emergency Core Cooling System (ECCS) equipment and flow paths details from the LCO.

The removal of ECCS equipment and flow paths details from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications in order to provide adequate protection of public health and safety. The ITS requires the ECCS equipment and flow paths to be OPERABLE and lists the equipment and flow paths in the Bases. This change is acceptable because this type of detail will be adequately controlled in the TS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because ECCS equipment and flow paths details is being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.5.2 contains a footnote, #, that states the inoperability of the required Emergency Diesel Generator (EDG) does not constitute inoperability of the associated Safety Injection pumps. The ITS does not contain this footnote. This changes the CTS by moving the footnote from the Technical Specification to the Bases.

The removal of these details that clarified information concerning the EDGs is acceptable because this type of information is not necessary to be included in the Technical Specifications (TS) to provide adequate protection of public health and safety. The ITS does not change any EDG requirements. This change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA03 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program,* ISI Program, or Surveillance Frequency Control Program) CTS SR 4.5.2 a contains a list of valves whose indicated positions are required to be verified by Control Room indication. One of the valves (HCV-758) contains a footnote that the air supply to the valve shall be verified shut off and sealed closed in accordance with the Surveillance Frequency Control Program (SFCP). ITS SR 3.5.2.1 does not contain this type of detail. This changes the CTS by moving the requirement out of Technical Specification.

The removal of these specific details on how to meet the surveillance for the valves from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to perform the SR. Also, this change is acceptable because these types of details will be adequately controlled in the SFCP. Changes to the SFCP are controlled by 10 CFR 50.59. The 10 CFR 50.59 program provides for the evaluation of changes to ensure SRs are properly controlled. This change is designated as a less restrictive removal of detail change because SR details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA04 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS SR 4.5.2 f.2 is in terms of components. ITS SR 3.5.2.6 states "Verify each ECCS pump starts automatically on an actual or simulated actuation signal." This changes the CTS by moving components of CTS SR 4.5.2 f.2 to the Bases.

The removal of these details for ECCS pumps from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the ECCS pump capability. Also, this change is acceptable because these types of details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA05 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program,* ISI Program, or Surveillance Frequency Control Program) CTS 3.5.2 ACTIONS c, d, e, and g provide Actions when a pump or its associated flow path(s) is inoperable. ITS 3.5.2 ACTIONS B, C, D, F provides Actions when a pump is inoperable. This changes the CTS by not specifically including the associated flow path(s).

The exclusion of the associated flow path(s) from the Actions when a pump is inoperable is acceptable because this detail is being placed in the Bases. The Bases requires four Safety Injection pumps with a discharge flow path.

Therefore, this information is not required to be in the TS to provide adequate protection of public health and safety. This type of information can be adequately controlled in the Technical Specifications Bases and any changes are controlled via the Technical Specification Bases Control Program. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as less restrictive removal of detail change because requirements are being removed from the Technical Specifications.

LA06 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program,* ISI Program, or Surveillance Frequency Control Program) CTS SR 4.5.2.d requires a visual inspection of containment for loose debris that could be transported to the containment sump and restrict the suction of the pumps. This is required to be performed once daily and prior to establishing Containment Integrity. ITS 3.5.2 will not contain this surveillance. This changes the CTS by moving the requirement out of Technical Specifications.

The removal of the requirement to perform a visual inspection of accessible areas of containment for loose debris once daily and prior to establishing containment integrity from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. Also, this change is acceptable because these types of details will be adequately controlled in the TRM. Changes to the TRM are controlled by 10 CFR 50.59. The 10 CFR 50.59 program provides for the evaluation of changes to ensure surveillances in the TRM are properly controlled. This change is designated as a less restrictive removal of detail change because SR details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA07 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS SR 4.5.2 e.3 requires performance of a visual inspection of the containment sump and verification that the suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion. ITS SR 3.5.2.9 requires a similar surveillance but does not provide examples of the sump components. This changes the CTS by moving the example of sump components to the Bases.

The removal of these details (trash racks, screens, etc.) of examples of containment sump components from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to perform the inspection of the sump components. Also, this change is acceptable because these types of details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 7 – Relaxation of Surveillance Frequency Change –* NON-24 MONTH TYPE CHANGE*)* CTS SR 4.5.2 g.1 requires the position stops for ECCS throttle valves be verified to be in the correct position within 4 hours following completion of each valve stroking operation or maintenance on the valve when the valve is required to be OPERABLE. The ITS does not contain this requirement. This changes the CTS by eliminating the requirement from Technical Specifications.

The purpose of CTS SR 4.5.2 g.1 is to ensure the position stops are realigned following stroking or maintenance. The ITS does not contain any other frequency for verifying valve alignment besides the routine interval in the SFCP. This change is acceptable because following maintenance or stroking the valves will be verified to be in position by other unit requirements. Following maintenance on any valve, the valve stops are required to be verified in position in order to be called OPERABLE. The plant controls (maintenance rule and plant procedures) ensure that an acceptable level of equipment reliability is provided. The post maintenance and post testing requirements will continue to be performed such that the verification of the position stops will not change. This change is designated as less restrictive because Surveillances will be performed less frequently per Technical Specifications under the ITS than under the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2

LCO 3.5.2 ~~Two~~ ECCS ~~trains~~ shall be OPERABLE. (Equipment and flow paths) (1)

Footnote *

Only three safety injection (SI) Pumps are required to be OPERABLE when the opposite unit is in MODE 4, 5, 6, or defueled.

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

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

(2)

Applicability Note**

Entry into MODE 3 and operation in MODE 3 is allowed with SI flow paths isolated when Tavg ≤ 380ºF.

2. ~~In MODE 3, ECCS pumps may be made incapable of injecting to support transition into or from the Applicability of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for up to 4 hours or until the temperature of all RCS cold legs exceeds [375°F] [Low Temperature Overpressure Protection (LTOP) arming temperature specified in the PTLR plus [25]°F], whichever comes first.]~~

Applicability

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Action a A. One ~~or more trains~~ inoperable. (Residual Heat Removal (RHR) heat exchanger, RHR suction flow path from containment sump, RHR parallel injection flow path, or safety injection parallel flow path)	A.1 Restore ~~train(s)~~ to OPERABLE status. (component or flow path)	72 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program (INSERT 1A) (1) (2) (1)
Actions a, e, f, g, h ~~B~~. (H) Required Action and associated Completion Time not met. (of Condition A, D, E, F, or G)	~~B~~.1 Be in MODE 3. (H) AND ~~B~~.2 Be in MODE 4.	6 hours 12 hours (3) (1)

(INSERT 1B)

CTS

(1) INSERT 1A (page 1 of 2)

Action c	B. ----------NOTE-------- ACTION B applies to both units simultaneously. ---------- One SI Pump inoperable with the opposite Unit in MODE 1, 2, or 3.	B.1	Restore SI Pump to OPERABLE status.	30 days OR In accordance with the Risk Informed Completion Time Program
Action d	C. ----------NOTE-------- ACTION C applies to both units simultaneously. ---------- Two Safety Injection pumps inoperable with the opposite Unit in MODE 1, 2, or 3.	C.1	Restore one SI Pump to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program
Action e	D. One required SI pumps inoperable with the opposite Unit in MODE 4, 5, 6, or defueled.	D.1	Restore required SI Pump to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program
Action f	E. One or more SI pump(s) not capable of being powered from its associated Emergency Diesel Generator (EDG).	E.1	Restore Safety Injection pump(s) capability to be powered from associated EDG	14 days OR In accordance with the Risk Informed Completion Time Program

CTS

(1) INSERT 1A (page 2 of 2)

Action g	F. One RHR pump inoperable.	F.1 Restore RHR pump to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
Action h	G. Suction flow path from Refueling Water Storage Tank (RWST) inoperable.	G.1 Restore suction flow path from RWST to OPERABLE status.	1 hour

(1) INSERT 1B

Actions c & d	I. Required Action and associated Completion Time of Condition B or C not met.	I.1 Be in MODE 3. AND I.2 Be in MODE 4	12 hours 18 hours

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Less than 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	C.1 Enter LCO 3.0.3.	Immediately

1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1 [Verify the following valves are in the listed position with power to the valve operator removed. Number Position Function [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	[12 hours OR In accordance with the Surveillance Frequency Control Program]
SR 3.5.2.2 ----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	[31 days OR In accordance with the Surveillance Frequency Control Program]

SR 4.5.2.a

INSERT 2

INSERT 3

SR 4.5.2.b.2 Footnote

SR 4.5.2.b.2

2

2

Turkey Point Unit 3 and Unit 4

Amendment XXX and YYY

3

2 **INSERT 2**

----------NOTE----------
Power may be restored to the valves for ≤ 1 hour for surveillance or maintenance when continuous valve position indication is unavailable in the control room.
---

2 **INSERT 3**

Valve Number	Valve Position	Valve Function
864A and B	Open	Supply from RWST to ECCS
862A and B	Open	RWST Supply to RHR pumps
863A and B	Closed	RHR Recirculation
866A and B	Closed	H.H.S.I. to Hot Legs
HCV-758	Open	RHR HX Outlet

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
SR 4.5.2.b.1	SR 3.5.2.3	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (2)
SR 4.5.2.c	SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 4.5.2.e.1 SR 4.5.2.e.1 SR 4.5.2.f.1	SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (2)
SR 4.5.2.f.2	SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (2)

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 4.5.2.g SR 3.5.2.7	[Verify, for each ECCS throttle valve listed below, each position stop is in the correct position. Valve Number [ ] [ ] [ ] HCV-*-758 MOV-*-872	[[18] months OR In accordance with the Surveillance Frequency Control Program]]

2

SR 4.5.2.e.1
SR 4.5.2.e.2
SR 4.5.2.e 3

Insert 4

1

Turkey Point Unit 3 and Unit 4

Amendment XXX and YYY

3

CTS

1 **INSERT 4**

SR 4.5.2.e.1 SR 4.5.2.e.2	SR 3.5.2.8	Verify interlocks between the RHR and RCS, and between the RHR and RWST perform as required.	In accordance with the Surveillance Frequency Control Program
SR 4.5.2.e.3	SR 3.5.2.9	Verify, by visual inspection, the containment sump does not show structural damage, abnormal corrosion, or debris blockage.	

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.2, ECCS - OPERATING

1. Due to the uniqueness of the Turkey Point Nuclear Generating Station (PTN) Emergency Core Cooling System (ECCS), changes are made to reflect the current licensing basis.

2. The Improved Standard Technical Specifications (ISTS) contain bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.2 ECCS - Operating

BASES

BACKGROUND

The function of the ECCS is to provide core cooling and negative reactivity to ensure that the reactor core is protected after any of the following accidents:

a. Loss of coolant accident (LOCA), coolant leakage greater than the capability of the normal charging system,

b. Rod ejection accident,

c. Loss of secondary coolant accident, including uncontrolled steam release or loss of feedwater, and

d. Steam generator tube rupture (SGTR).

The addition of negative reactivity is designed primarily for the loss of secondary coolant accident where primary cooldown could add enough positive reactivity to achieve criticality and return to significant power.

~~There are three phases of ECCS operation: injection, cold leg recirculation, and hot leg recirculation~~. In the injection phase, water is taken from the refueling water storage tank (RWST) and injected into the Reactor Coolant System (RCS) through the cold legs. When sufficient water is removed from the RWST to ensure that enough boron has been added to maintain the reactor subcritical and the containment sumps have enough water to supply the required net positive suction head to the ECCS pumps, suction is switched to the containment sump for cold leg recirculation. After approximately ~~24~~ hours, the ECCS flow is ~~shifted~~ to the hot leg recirculation phase to provide a backflush, which would reduce the boiling in the top of the core and any resulting boron precipitation.

The ECCS consists of ~~three~~ ~~separate~~ subsystems: ~~centrifugal charging~~ (high head), ~~safety injection (SI) (intermediate head),~~ and residual heat removal (RHR) (low head). ~~Each subsystem consists of two redundant, 100% capacity trains.~~ The ECCS accumulators and the RWST are also part of the ECCS, but are not considered part of an ECCS flow path as described by this LCO.

INSERT 1A

1

Cold leg recirculation is initiated 45 minutes after the event and provided by two SI pumps.

initiated

1

5.5

After 6.5 hours the hot leg recirculation is fully initiated. The ECCS is cycled back to the cold legs by 17 hours into the event with all subsequent cycling on 16 hour intervals until boiling is terminated.

INSERT 1B

1

safety injection (SI)

1

1 **INSERT 1A**

There are two modes of ECCS operation, injection and recirculation. The injection mode consists of the injection phase and the recirculation mode consists of the cold leg recirculation phase and hot leg recirculation phase.

1 **INSERT 1B**

The OPERABILITY of ECCS components and flowpaths required in MODES 1, 2, and 3 ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming any single active failure consideration. Two SI pumps and one RHR pump operating in conjunction with two accumulators are capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop. The integrity of the cold leg injection flowpath can be impacted by the opposite unit if a discharge path is opened in a low pressure condition. This is not normally a concern based on the opposite unit operating at 2235 psig maintaining cold leg injection check valves closed. In addition, the RHR subsystem provides long-term core cooling capability in the Recirculation mode during the accident recovery period. Management of gas voids is important to ECCS OPERABILITY.

BASES

BACKGROUND (continued)

The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the RWST can be injected into the RCS following the accidents described in this LCO. The major components of each subsystem are the ~~centrifugal charging~~ pumps, the RHR pumps, heat exchangers~~, and the SI pumps~~. Each of the ~~three~~ subsystems ~~consists of two 100% capacity trains that~~ are interconnected and redundant such that ~~either train~~ is capable of supplying ~~100%~~ of the flow required to mitigate the accident consequences. This interconnecting and redundant subsystem design provides the operators with the ability to utilize components from ~~opposite trains~~ to achieve the required 100% flow to the core.

SI

and,

RHR

ECCS

1

for the SI pumps

redundant equipment shared between units

During the injection phase of LOCA recovery, a suction header supplies water from the RWST to the ECCS pumps. ~~Separate piping supplies each subsystem and each train within the subsystem. The discharge from the~~ ~~centrifugal~~ charging pumps ~~combines prior to entering the boron injection tank (BIT) (if the plant utilizes a BIT) and then divides again into four supply lines, each of which feeds the injection line to one RCS cold leg.~~ The discharge from the SI and RHR pumps divides and feeds an injection line to each of the RCS cold legs. ~~Control~~ valves are set to balance the flow to the RCS. This balance ensures sufficient flow to the core to meet the analysis assumptions following a LOCA in one of the RCS cold legs.

1

go into common headers (one for SI and one for RHR) and then

Throttle

three

For LOCAs that are too small to depressurize the RCS below the shutoff head of the ~~SI~~ pumps, the ~~centrifugal charging~~ pumps supply water until the RCS pressure decreases below the ~~SI~~ pump shutoff head. During this period, the steam generators are used to provide part of the core cooling function.

SI

RHR

1

(via atmospheric dump valves)

For even smaller breaks above the SI shutoff head, the steam generators solely provide the core cooling function.

During the recirculation phase of LOCA recovery, RHR pump suction is transferred to the containment sump. The RHR pumps then supply the other ECCS pumps. Initially, recirculation is through the ~~same paths as the injection phase~~. Subsequently, recirculation alternates injection between the hot and cold legs.

can

RCS cold leg

1

See UFSAR 6.2.2, for more details on hot and cold leg recirculation.

The ~~centrifugal charging~~ subsystem of the ECCS also functions to supply borated water to the reactor core following increased heat removal events, such as a main steam line break (MSLB). The limiting design conditions occur when the negative moderator temperature coefficient is highly negative, such as at the end of each cycle.

1

SI

1

BASES

BACKGROUND (continued)

During low temperature conditions in the RCS, limitations are placed on the maximum number of ECCS pumps that may be OPERABLE. Refer to the Bases for LCO 3.4.12, "~~Low Temperature Overpressure Protection (LTOP) System~~," for the basis of these requirements.

The ECCS subsystems are actuated upon receipt of an SI signal. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the emergency diesel generators (EDGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA.

The active ECCS components, along with the passive accumulators, the RWST, and the containment sump, are covered in LCO 3.5.1, "Accumulators," LCO 3.5.4, "Refueling Water Storage Tank (RWST)," and LCO 3.6.~~10~~, "Containment Sump," and provide the cooling water necessary to meet GDC ~~35~~ (Ref. 1).

APPLICABLE SAFETY ANALYSES

The LCO helps to ensure that the following acceptance criteria for the ECCS, established by 10 CFR 50.46 (Ref. 2), will be met following a LOCA:

a. Maximum fuel element cladding temperature is ~~≤~~ 2200°F,

b. Maximum cladding oxidation is ~~≤~~ 0.17 times the total cladding thickness before oxidation,

c. Maximum hydrogen generation from a zirconium water reaction is ~~≤~~ 0.01 times the hypothetical amount generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react,

d. Core is maintained in a coolable geometry, and

e. Adequate long term core cooling capability is maintained.

The LCO also limits the potential for a post trip return to power following an MSLB event and ensures that containment temperature limits are met.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Each ECCS subsystem is taken credit for in a large break LOCA event at full power (Refs. 3 and 4). This event establishes the requirement for runout flow for the ECCS pumps, as well as the maximum response time for their actuation. The ~~centrifugal charging~~ pumps ~~and SI pumps~~ are credited in a small break LOCA event. This event establishes the flow and discharge head at the design point for the ~~centrifugal charging~~ pumps. The SGTR and MSLB events also credit the ~~centrifugal charging~~ pumps. The OPERABILITY requirements for the ECCS are based on the following LOCA analysis assumptions:

SI

SI

1

1

a safeguards train leaving only one RHR pump and two SI pumps in operation.

a. A large break LOCA event, with loss of ~~offsite power and a single failure disabling one RHR pump (both EDG trains are assumed to operate due to requirements for modeling full active containment heat removal system operation)~~ and

b. A small break LOCA event, with a loss of offsite power and a single failure disabling one ECCS train.

During the blowdown stage of a LOCA, the RCS depressurizes as primary coolant is ejected through the break into the containment. The nuclear reaction is terminated either by moderator voiding during large breaks or control rod insertion for small breaks. Following depressurization, emergency cooling water is injected into the cold legs, flows into the downcomer, fills the lower plenum, and refloods the core.

The effects on containment mass and energy releases are accounted for in appropriate analyses (Refs. ~~3 and~~ 4). The LCO ensures ~~that an~~ ECCS ~~train~~ will deliver sufficient water to match boiloff rates soon enough to minimize the consequences of the core being uncovered following a large LOCA. It also ensures that the ~~centrifugal charging and~~ SI pumps will deliver sufficient water and boron during a small LOCA to maintain core subcriticality. For smaller LOCAs, the ~~centrifugal charging~~ pump delivers sufficient fluid to maintain RCS inventory. For a small break LOCA, the steam generators continue to serve as the heat sink, providing part of the required core cooling.

the

1

1

SI

1

Insert 2

satisfies

The ECCS ~~trains satisfy~~ Criterion 3 of 10 CFR 50.36(c)(2)(ii).

equipment and flow paths

1

LCO

In MODES 1, 2, and 3, ~~two independent (and~~ redundant~~)~~ ECCS ~~trains~~ are required to ensure that sufficient ECCS flow is available, assuming a single failure ~~affecting either train~~. Additionally, individual components within the ECCS ~~trains~~ may be called upon to mitigate the consequences of other transients and accidents.

1

active

1

1 **INSERT 2**

Two SI pumps and one RHR pump operating in conjunction with two accumulators are capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop.

BASES

equipment and flow paths required for OPERABILITY include:

LCO (continued)

In MODES 1, 2, and 3, ~~an~~ ECCS ~~train consists of a centrifugal charging subsystem, an SI subsystem, and an RHR subsystem. Each train~~ includes the piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST upon an SI signal and ~~automatically~~ transferring suction to the containment sump. 1

INSERT 3

This also

manually

During an event requiring ECCS actuation, a flow path is required to provide an abundant supply of water from the RWST to the RCS via the ECCS pumps and their respective supply headers to each of the ~~four~~ cold leg injection nozzles. In the long term, this flow path may be switched to take its supply from the containment sump and to supply its flow to the RCS hot and cold legs. Management of gas voids is important to ECCS OPERABILITY. Three 1

As indicated in Note 1, only three SI pumps are required to be OPERABLE when the opposite unit is in MODE 4, 5, 6, or defueled.

The flow path ~~for each train~~ must maintain ~~its~~ designed independence to ensure that no single failure can disable ~~both~~ ECCS ~~trains~~. 1

active

the

As indicated in Note ~~1~~, the SI flow paths may be isolated ~~for 2 hours~~ in MODE 3, under controlled conditions~~, to perform pressure isolation valve testing per SR 3.4.14.1. The flow path is readily restorable from the control room.~~ 1

2

provided Tavg is maintained ≤ 380°F.

~~As indicated in Note 2, operation in MODE 3 with ECCS trains made incapable of injecting in order to facilitate entry into or exit from the Applicability of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," is necessary for plants with an LTOP arming temperature at or near the MODE 3 boundary temperature of 350°F. LCO 3.4.12 requires that certain pumps be rendered incapable of injecting at and below the LTOP arming temperature. When this temperature is at or near the MODE 3 boundary temperature, time is needed to make pumps incapable of injecting prior to entering the LTOP Applicability, and provide time to restore the inoperable pumps to OPERABLE status on exiting the LTOP Applicability.~~ 1

APPLICABILITY

In MODES 1, 2, and 3, the ECCS OPERABILITY requirements for the limiting Design Basis Accident, a large break LOCA, are based on full power operation. Although reduced power would not require the same level of performance, the accident analysis does not provide for reduced cooling requirements in the lower MODES. The ~~centrifugal charging~~ SI pump performance is based on a small break LOCA, which establishes the pump performance curve and has less dependence on power. ~~The SI pump performance requirements are based on a small break LOCA. MODE 2 and MODE 3 requirements are bounded by the MODE 1 analysis.~~ 1 1

1

(1) **INSERT 3**

a. Safety Injection Pump Requirements

1. Both Units in MODE 1, 2, or 3 - Four SI pumps, each capable of being powered from its associated OPERABLE diesel generator, with discharge flow paths aligned to the RCS cold legs

2. One Unit in MODE 1, 2, or 3 and the opposite Unit in MODE 4, 5, 6, or defueled - Three SI pumps (two associated with the unit and one from the opposite unit), each capable of being powered from its associated OPERABLE diesel generator, with discharge flow paths aligned to the RCS cold leg are required if the opposite unit is in MODE 4, 5, 6 or defueled.),

b. Two RHR heat exchangers,

c. Two RHR pumps with discharge flow paths aligned to the RCS cold legs,

d. A flow path capable of taking suction from the refueling water storage tank as defined in Specification 3.5.4, and

e. Two flow paths capable of taking suction from the containment sump.

BASES

APPLICABILITY (continued)

This LCO is only applicable in MODE 3 and above. Below MODE 3, the SI signal setpoint is manually bypassed by operator control, and system functional requirements are relaxed as described in LCO 3.5.3, "ECCS - Shutdown."

In MODES 5 and 6, plant conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level."

ACTIONS

A.1

RHR heat exchanger, RHR suction flow path from containment sump, RHR parallel injection flow path, or safety injection parallel flow path

With one ~~or more trains~~ inoperable ~~and at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available~~, the inoperable components must be returned to OPERABLE status within 72 hours ~~[~~or in accordance with the Risk Informed Completion Time Program~~]~~. The 72 hour Completion Time is based on an NRC reliability evaluation (Ref. 5) and is a reasonable time for repair of many ECCS components.

(RICT)

1

3

The

~~An~~ ECCS ~~train~~ is inoperable if it is not capable of delivering design flow to the RCS. Individual components are inoperable if they are not capable of performing their design function or supporting systems are not available.

1

The LCO requires the OPERABILITY of a number of ~~independent subsystems~~. Due to the redundancy ~~of trains~~ and the diversity of ~~subsystems~~, the inoperability of one component ~~in a train~~ does not render the ECCS incapable of performing its function. Neither does the inoperability of two different components, each in a different ~~train,~~ necessarily result in a loss of function for the ECCS. This allows increased flexibility in plant operations under circumstances when components ~~in opposite trains~~ are inoperable.

flow paths and equipment

the ECCS

flow path

various

1

part of

An event accompanied by a loss of offsite power and the failure of an EDG can disable ~~one~~ ECCS ~~train~~ until power is restored. A reliability analysis (Ref. 5) has shown that the impact of having one full ECCS train inoperable is sufficiently small to justify continued operation for 72 hours.

1

BASES

ACTIONS (continued)

~~Reference 6 describes situations in which one component, such as an RHR crossover valve, can disable both ECCS trains. With one or more component(s) inoperable such that 100% of the flow equivalent to a single OPERABLE ECCS train is not available, the facility is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be immediately entered.~~

H

Insert 4A

4

~~B~~.1 and ~~B~~.2

component or flow path in Conditions A, D, E, F, G

If the inoperable ~~trains~~ cannot be returned to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to 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.

1

Insert 4B

4

~~C.1~~

~~Condition A is applicable with one or more trains inoperable. The allowed Completion Time is based on the assumption that at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train is available. With less than 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available, the facility is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.~~

4

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render ~~both~~ ECCS ~~trains~~ inoperable. Securing these valves in position by removal of power or by key locking the control in the correct position ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. These valves are of the type, described in Reference 6, that can disable the function of both ECCS trains and invalidate the accident analyses. ~~[A 12 hour Frequency is considered reasonable in view of other administrative controls that will ensure a mispositioned valve is unlikely.~~

the

1

3

1

4 **INSERT 4A** (page 1 of 2)

B.1

If one SI pump is inoperable and the opposite unit is in MODE 1, 2, or 3, the inoperable pump must be restored to OPERABLE status in 30 days or in accordance with the RICT Program. The Completion Time is indicative of needing two SI pumps and one RHR pump operating in conjunction with two accumulators to supply sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop.

The Condition is modified by a note that requires both units to enter the Action simultaneously if in this condition. There are a total of four SI Pumps between the two Units and if one is inoperable it affects both units. 4

C.1

If two SI pumps are inoperable and the opposite unit is in MODE 1, 2, or 3, the inoperable pump must be restored to OPERABLE status in 72 hours or in accordance with the RICT Program. The Completion Time is indicative of needing two SI pumps and one RHR pump operating in conjunction with two accumulators to supply sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop.

The Condition is modified by a note that requires both units to enter the Action simultaneously if in this condition. There are a total of four SI Pumps between the two units and if one is inoperable it affects both units.

D.1

If one unit is in MODE 1, 2 or 3, and the opposite unit is in MODE 4, 5, 6, or defueled, only three SI pumps are required. If one SI pump is inoperable and the opposite unit is in MODE 4, 5, 6, or defueled, the inoperable pump must be restored to OPERABLE status in 72 hours or in accordance with the RICT Program. The Completion Time is indicative of needing two SI pumps and one RHR pump operating in conjunction with two accumulators to supply sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop.

4 **INSERT 4A** (page 2 of 2)

E.1

If one or more SI pump(s) are not capable of being powered from its associated EDG, the capability to be powered from the associated EDG must be restored. The 14 day or in accordance with the RICT Program. The Completion Time is consistent with the Completion Time for an inoperable EDG.

F.1

If one RHR pump is inoperable, it must be restored within 7 days or in accordance with the RICT Program. The Completion Time is based on the results of a deterministic and probabilistic safety assessment, and indicative of needing two SI pumps and one RHR pump operating in conjunction with two accumulators to supply sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all pipe break sizes up to and including the maximum hypothetical accident of a circumferential rupture of a reactor coolant loop.

G.1

If suction flow path is lost from one RWST, it must be restored in 1 hour. This Completion Time is consistent with the Completion Time if an RWST is inoperable for reasons other than boron concentration.

4 **INSERT 4B**

I.1 and I.2

When Required Action B.1, or C.1, cannot be completed within the required Completion Time the units must be placed in a MODE in which the LCO does not apply. If these Required Actions affect both units and a dual unit shutdown is required, both Units are allowed to be placed in at least MODE 3 within 12 hours, and in MODE 4 within 18 hours.

This will allow the orderly shutdown of one unit at a time and NOT jeopardize the stability of the electrical grid by imposing a simultaneous dual unit shutdown. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

SURVEILLANCE REQUIREMENTS (continued)

3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~REVIEWER'S NOTE~~

~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~

2

~~]~~

SR 3.5.2.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This Surveillance does not require any testing or valve manipulation. Rather, it involves verification that those valves capable of being mispositioned are in the correct position. ~~[The 31 day Frequency is appropriate because the valves are operated under administrative control, and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.~~

3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~REVIEWER'S NOTE~~

~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~

2

~~]~~

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance is modified by a Note which exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent flow path who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the system vent flow path if directed.

SR 3.5.2.3

ECCS piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the ECCS and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of ECCS locations susceptible to gas accumulation is based on a review of system design information, including piping and instrumentation drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walk downs to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as stand-by versus operating conditions.

The ECCS is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If the accumulated gas is eliminated or brought within the acceptable criteria limits during performance of the Surveillance, the Surveillance is met and past system OPERABILITY is evaluated under the Corrective Action Program. If it is determined by subsequent evaluation that the ECCS is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

ECCS locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative sub-set of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, the plant configuration, or personnel safety. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

~~[The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

~~----------REVIEWER'S NOTE----------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~----------]~~

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump

3
2
1

BASES

SURVEILLANCE REQUIREMENTS (continued)

baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the INSERVICE TESTING PROGRAM. The ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.5 and SR 3.5.2.6

These Surveillances demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal and that each ECCS pump starts on receipt of an actual or simulated SI signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. [The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned plant transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REVIEWER'S NOTE

Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.

]

INSERT 5

SR 3.5.2.7

Realignment of valves in the flow path on an SI signal is necessary for proper ECCS performance. These valves have stops to allow proper positioning for restricted flow to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. This Surveillance is not required for plants with flow limiting orifices. [The 18 month Frequency is based on the same reasons as those stated in SR 3.5.2.5 and SR 3.5.2.6.

4 **INSERT 5**

In accordance with the Surveillance Frequency Control Program:

a. Verifying automatic isolation and interlock action of the RHR system from the Reactor Coolant System by ensuring that with a simulated or actual Reactor Coolant System pressure signal greater than or equal to 525 psig the interlocks cause the valves to automatically close and prevent the valves from being opened;

b. Verifying correct interlock action to ensure that the RWST is isolated from the RHR System during RHR System operation and to ensure that the RHR System cannot be pressurized from the Reactor Coolant System unless the above RWST Isolation Valves are closed;

c. Verifying that each automatic valve in the flow path actuates to its correct position on Safety Injection actuation test signal.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

INSERT 6

4

~~REVIEWER'S NOTE~~

~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~

2

INSERT 7

~~]~~

4

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 35~~. 1967 AEC Proposed (final), GDC 44

1

2. 10 CFR 50.46.

U

3. FSAR, Section ~~[ ]~~. 6.3

1 3

U

4. FSAR, Chapter ~~[15]~~, "Accident Analysis." 14

1 3

5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.

6. IE Information Notice No. 87-01.

4 **INSERT 6**

Verifying that each of the following pumps start automatically upon receipt of a SI actuation test signal:

a) SI pump, and
b) RHR pump.

4 **INSERT 7**

SR 3.5.2.8

This SR requires verification of the interlocks between the RHR and RCS and between the RHR and RWST. Verifying automatic isolation and interlock action of the RHR system from the RCS by ensuring that with a simulated or actual RCS pressure signal greater than or equal to 525 psig the interlocks cause the valves to automatically close and prevent the valves from being opened. Verifying correct interlock action to ensure that the RWST is isolated from the RHR System during RHR System operation and to ensure that the RHR System cannot be pressurized from the RCS unless the above RWST isolation valves are closed.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.3.9

Periodic inspections are performed to verify the containment sump (components such as trash racks, screens, etc.) does not show current or potential debris blockage, structural damage, or abnormal corrosion to ensure the operability and structural integrity of the containment sump.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.2 BASES, ECCS OPERATING

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. Changes are made to reflect changes made to the Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.5.2, ECCS - OPERATING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 3

ITS 3.5.3, ECCS - SHUTDOWN

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS

EMERGENCY CORE COOLING SYSTEMS

3/4.5.3 ECCS SUBSYSTEMS - T_{avg} LESS THAN 350°F

LIMITING CONDITION FOR OPERATION

LCO 3.5.3

3.5.3 ~~As a minimum, the following~~ ECCS ~~components and flow path~~ shall be OPERABLE:

One

Train

A01

~~a. One OPERABLE RHR heat exchanger,~~

~~b. One OPERABLE RHR pump, and~~

~~c. An OPERABLE flow path capable of (1) taking suction from the refueling water storage tank upon being manually realigned and (2) transferring suction to the containment sump during the recirculation phase of operation.~~

LA01

NOTE: An RHR Train may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned to the ECCS mode of operation.

L01

Applicability

APPLICABILITY: MODE 4.

ACTION:

NOTE: LCO 3.0.4.b is not applicable to ECCS high head subsystem.

M01

a. ~~With no OPERABLE ECCS flow path from the refueling water storage tank, restore at least one ECCS flow path to OPERABLE status within 1 hour or be in COLD SHUTDOWN within the next 24 hours.~~

L02

NOTE: LCO 3.0.4.a is not applicable when entering MODE 4.

M01

Action A

b. With either the residual heat removal heat exchanger or RHR pump inoperable, restore the components to OPERABLE status or maintain the Reactor Coolant System T_{avg} less than 350°F by use of alternate heat removal methods.

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

4.5.3 The above ECCS components shall be demonstrated OPERABLE per the applicable requirements of Specification 4.5.2.

DISCUSSION OF CHANGES
ITS 3.5.3, ECCS - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 ITS 3.5.3 ACTIONS contain two Notes; the overall ACTIONS note states that Limiting Condition for Operation (LCO) 3.0.4.b is not applicable to the Emergency Core Cooling System (ECCS) high head subsystem and the Required Action A.1 Note states LCO 3.0.4.a is not applicable when entering MODE 4. CTS 3.5.3 does not contain either of these Notes. This changes the CTS by adding two notes that make exemptions to LCOs 3.0.4.b and 3.0.4.a.

The purpose of CTS 3.5.3 ACTIONS is to ensure one ECCS train is available in MODE 4. While the unit can be cooled down with the Steam Generators, using the Residual Heat Removal (RHR) system is the preferred method.

A Note prohibits the application of LCO 3.0.4.b to an inoperable ECCS high head subsystem when entering MODE 4. There is an increased risk associated with entering MODE 4 from MODE 5 with an inoperable ECCS high head subsystem and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

Required Action A.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit. This change is designated as more restrictive because it removes allowances provided by LCO 3.0.4.a and LCO 3.0.4.b from CTS.

DISCUSSION OF CHANGES
ITS 3.5.3, ECCS - SHUTDOWN

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – – Removal of LCO, SR, or other TS requirement to the TRM, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program*) CTS 3.5.3 lists the components and flow paths required to be OPERABLE in the LCO. ITS 3.5.3 does not list the components and flow paths in the LCO. This changes the CTS by removing ECCS equipment and flow paths details from the LCO.

The removal of ECCS equipment and flow paths details from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications in order to provide adequate protection of public health and safety. The ITS requires the ECCS equipment and flow paths to be OPERABLE and lists the equipment and flow paths in the Bases. This change is acceptable because this type of detail will be adequately controlled in the TS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because ECCS equipment and flow paths details is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 1 – Relaxation of LCO Requirements)* ITS 3.5.3 contains a Note that allows an RHR Train to be considered OPERABLE during alignment and operation for decay heat removal (DHR) if the RHR Train is capable of being manually realigned to the ECCS mode of operation. CTS 3.5.3 does not contain this allowance. This changes the CTS by adding a Note that allows the RHR system to be considered OPERABLE while aligning for DHR if it can be manually realigned to the RHR mode of operation.

The purpose of the CTS is to ensure a method of Reactor Coolant System (RCS) heat removal is available. The ITS Note allows operational flexibility during alignment of DHR. This change is acceptable because the LCO requirements continue to ensure that the systems and components are maintained consistent with the safety analyses and licensing basis. Manual realignment capability of RHR is a requirement to adopt the allowance. Therefore, RHR remains available if needed for heat removal. This change is designated as less restrictive because less stringent LCO requirements, in the form of an LCO Note, are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.5.3 ACTION a allows one hour to restore an ECCS flow path from the Refueling Water Storage Tank (RWST) and, if it cannot be restored, requires a cooldown to COLD SHUTDOWN. ITS 3.5.3 requires an immediate initiation of Action to restore the ECCS train. This changes CTS by eliminating a cooldown requirement if the flow path cannot be restored.

The purpose of CTS 3.5.3 ACTION a is to restore an ECCS flow path if there is none OPERABLE and further requires a cooldown if it cannot be restored. ITS does not require a cooldown but requires immediate Action to commence to restore the ECCS train. This is the more prudent action when there is no cooling capability. Since the ECCS is the preferred cooldown method and it is not available, it is more prudent to stay in MODE 4 until a train of ECCS can be restored. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition. This includes a reasonable time for repairs or replacement, and the low probability of a Design Basis Accident (DBA) occurring during the repair period. With no ECCS flow paths available, it would be unwise to require the plant to go to MODE 5, where the only available heat removal system is the RHR. Therefore, the appropriate action is to initiate measures to restore one ECCS RHR subsystem and to continue the actions until the subsystem is restored to OPERABLE status. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS - Shutdown

LCO 3.5.3

LCO 3.5.3 One ECCS train shall be OPERABLE.

----------NOTE----------
An RHR train may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned to the ECCS mode of operation.

Applicability

APPLICABILITY: MODE 4.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to ECCS high head subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION b A. Required ECCS train inoperable.	A.1 ---------- NOTE ---------- LCO 3.0.4.a is not applicable when entering MODE 4. ---------- Initiate action to restore required ECCS train to OPERABLE status.	 Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 4.5.3 SR 3.5.3.1	The following SRs are applicable for all equipment required to be OPERABLE: ~~[~~SR 3.5.2.1~~]~~ ~~[~~SR 3.5.2.7~~]~~ ~~[~~SR 3.5.2.3~~]~~ SR 3.5.2.4	In accordance with applicable SRs (2)

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.3, ECCS - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.3 ECCS - Shutdown

BASES

BACKGROUND

The Background section for Bases 3.5.2, "ECCS - Operating," is applicable to these Bases, with the following modifications.

In MODE 4, the required ECCS train consists of two separate subsystems: ~~centrifugal charging~~ (high head) and residual heat removal (RHR) (low head). Safety Injection (SI) 1

The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the refueling water storage tank (RWST) and the containment sump can be injected into the Reactor Coolant System (RCS) following the accidents described in Bases 3.5.2.

APPLICABLE SAFETY ANALYSES

The Applicable Safety Analyses section of Bases 3.5.2 also applies to this Bases section.

Due to the stable conditions associated with operation in MODE 4 and the reduced probability of occurrence of a Design Basis Accident (DBA), the ECCS operational requirements are reduced. It is understood in these reductions that certain automatic ~~safety injection (~~SI~~)~~ actuation is not available. In this MODE, sufficient time exists for manual actuation of the required ECCS to mitigate the consequences of a DBA. 1

Only one train of ECCS is required for MODE 4. This requirement dictates that single failures are not considered during this MODE of operation. The ECCS trains satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

In MODE 4, one of the two independent (and redundant) ECCS trains is required to be OPERABLE to ensure that sufficient ECCS flow is available to the core following a DBA.

In MODE 4, an ECCS train consists of a ~~centrifugal charging~~ subsystem and an RHR subsystem. Each train includes the piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST and transferring suction to the containment sump. SI 1

During an event requiring ECCS actuation, a flow path is required to provide an abundant supply of water from the RWST to the RCS via the ECCS pumps and their respective supply headers to each of the ~~four~~ cold leg injection nozzles. In the long term, this flow path may be switched to take its supply from the containment sump and to deliver its flow to the RCS hot and cold legs. Management of gas voids is important to ECCS OPERABILILITY. three 1

INSERT 1 2

1 **INSERT 1**

As a minimum, the following ECCS components and flow path shall be OPERABLE:

a. One OPERABLE RHR heat exchanger,

b. One OPERABLE RHR pump, and

c. An OPERABLE flow path capable of (1) taking suction from the refueling water storage tank upon being manually realigned and (2) transferring suction to the containment sump during the recirculation phase of operation.

BASES

LCO (continued)

This LCO is modified by a Note that allows an RHR train to be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned (remote or local) to the ECCS mode of operation and not otherwise inoperable. This allows operation in the RHR mode during MODE 4.

APPLICABILITY

In MODES 1, 2, and 3, the OPERABILITY requirements for ECCS are covered by LCO 3.5.2.

In MODE 4 with RCS temperature below 350°F, one OPERABLE ECCS train is acceptable without single failure consideration, on the basis of the stable reactivity of the reactor and the limited core cooling requirements.

In MODES 5 and 6, plant conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable ECCS high head subsystem when entering MODE 4. There is an increased risk associated with entering MODE 4 from MODE 5 with an inoperable ECCS high head subsystem and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

With no ECCS RHR subsystem OPERABLE, the plant is not prepared to respond to a loss of coolant accident or to continue a cooldown using the RHR pumps and heat exchangers. The Completion Time of immediately to initiate actions that would restore at least one ECCS RHR subsystem to OPERABLE status ensures that prompt action is taken to restore the required cooling capacity. Normally, in MODE 4, reactor decay heat is removed from the RCS by an RHR loop. If no RHR loop is OPERABLE for this function, reactor decay heat must be removed by some alternate method, such as use of the steam generators. The alternate means of heat removal must continue until the inoperable RHR loop components can be restored to operation so that decay heat removal is continuous.

BASES

ACTIONS (continued)

With both RHR pumps and heat exchangers inoperable, it would be unwise to require the plant to go to MODE 5, where the only available heat removal system is the RHR. Therefore, the appropriate action is to initiate measures to restore one ECCS RHR subsystem and to continue the actions until the subsystem is restored to OPERABLE status.

SI

With no ECCS high head subsystem OPERABLE, due to the inoperability of the ~~centrifugal charging~~ pump or flow path from the RWST, the plant is not prepared to provide high pressure response to Design Basis Events requiring SI. The Completion Time of immediately to initiate action that would restore at least one ECCS high head subsystem to OPERABLE status ensures that prompt action is taken to provide the required cooling capacity.

Remaining within the Applicability of the LCO is acceptable to accomplish short duration repairs to restore inoperable equipment because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 1). In MODE 4 the steam generators and Residual Heat Removal System are available to remove decay heat, which provides diversity and defense in depth. As stated in Reference 1, the steam turbine driven auxiliary feedwater pump must be available to remain in MODE 4. Should steam generator cooling be lost while relying on this Required Action, there are preplanned actions to ensure long-term decay heat removal. Voluntary entry into MODE 5 may be made as it is also acceptable from a risk perspective.

Required Action A.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

The applicable Surveillance descriptions from Bases 3.5.2 apply.

REFERENCES

1. WCAP-16294-NP-A, Rev. 1, "Risk-Informed Evaluation of Changes to Technical Specification Required Action Endstates for Westinghouse NSSS PWRs," June 2010.

The applicable references from Bases 3.5.2 also apply.

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.3 BASES, ECCS – SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes have been made to reflect changes made to Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.5.3, ECCS - SHUTDOWN

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 4

ITS 3.5.4, REFUELING WATER STORAGE TANK

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

EMERGENCY CORE COOLING SYSTEMS

3/4.5.4 REFUELING WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

LCO 3.5.4 3.5.4 For single Unit operation, one refueling water storage tank (RWST) shall be OPERABLE or for dual Unit operation two RWSTs shall be OPERABLE with:

SR 3.5.4.2 a. A minimum indicated borated water volume of 320,000 gallons per RWST,

SR 3.5.4.3 b. A boron concentration between 2400 ppm and 2600 ppm,

SR 3.5.4.1 c. A minimum solution temperature of 39°F, and

SR 3.5.4.1 d. A maximum solution temperature of 100°F.

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

ACTION:

ACTION B With less than the required number of RWST(s) OPERABLE, restore the tank(s) to OPERABLE status within 1 hour or be ~~in at least HOT STANDBY~~ within 6 hours and ~~in COLD SHUTDOWN~~ within the following ~~30~~ hours.

ACTION C

Add proposed Action A

for reasons other than Condition A

L01

A01

L02

MODE 3

be in MODE 4

12

INSERT Required Action C.2 NOTE: LCO 3.0.4.a is not applicable when entering MODE 4.

SURVEILLANCE REQUIREMENTS

4.5.4 The required RWST(s) shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

SR 3.5.4.2 1) Verifying the indicated borated water volume in the tank, and

SR 3.5.4.3 2) Verifying the boron concentration of the water.

SR 3.5.4.1 b. By verifying the RWST temperature is within limits whenever the outside air temperature is less than

SR 3.5.4.1 Note 1 39°F or greater than 100°F ~~at the following frequencies~~:

In accordance with the Surveillance Frequency Control Program

SR 3.5.4.1 Note 2 1) ~~Within one hour~~ upon the outside temperature exceeding its limit for consecutive 23 hours, and

~~2) At least once per 24 hours while the outside temperature exceeds its limit.~~

LA01

DISCUSSION OF CHANGES
ITS 3.5.4, REFUELING WATER STORAGE TANK

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS Surveillance Requirement (SR) 4.5.4.b.2 requires the verification of the Refueling Water Storage Tank (RWST) temperature within one hour when outside air temperature limits have been exceeded for more than 23 hours, and at least once per 24 hours while the outside temperature exceeds its limit thereafter. ITS SR 3.5.4.1 requires similar Surveillances and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequency of "within one hour" and "once per 24 hours" of this SR to the Surveillance Frequency Control Program (SFCP).

The removal of these Surveillance Frequencies from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the SFCP. The Program shall ensure that SRs specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation (LCOs) are met. This change is designated as a less restrictive removal of detail change because a Surveillance Frequency is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.5.4 ACTION allows 1 hour to restore an inoperable RWST. ITS 3.5.4 ACTION A allows 8 hours to restore the RWST to OPERABLE status if the inoperability is due to the RWST boron concentration or temperature not within limits. ITS 3.5.4 ACTION B requires the restoration of the RWST to an OPERABLE status within 1 hour for reasons other than Condition A. This changes the CTS by increasing the Completion Time for restoration of an inoperable RWST due to boron concentration or temperature not within limits from 1 hour to 8 hours.

The purpose of CTS 3.5.4 Action is to require rapid correction of conditions that affect the of Emergency Core Cooling System (ECCS). This proposed change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering a reasonable time to restore the out of limit condition and the low probability of a Design Basis Accident (DBA) occurring during the allowed Completion Time. The primary function of the RWST is to provide large volumes of water to the Reactor Coolant System (RCS) following a Loss of Coolant Accident. This large volume of water continues to be available while in this Condition. As a result, the most important safety function of the RWST can still be provided. Because of the volume of the RWST, changes to the boron concentration or temperature occur slowly, and consequently would not go far out of limit. If one of these parameters was out of limit, more than one hour would likely be required to restore the parameter. Given the remaining abilities of the RWST, requiring a plant shutdown after one hour is not warranted. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.5.4 ACTION, in part, specifies that if the requirements of CTS 3.5.4 are not satisfied, the reactor shall be placed in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. ITS 3.5.4 Condition C states that if the Required Actions and associated Completion Times have not been met, the reactor must be placed in MODE 3 within 6 hours and in MODE 4 within a total of 12 hours. This changes the CTS by permitting a Required Action end state of hot shutdown (Mode 4) rather that an end state of cold shutdown (Mode 5).

One purpose of the CTS 3.5.4 ACTION is to provide an end state, a condition that the reactor must be placed in, if the Required Actions allowing remedial measures to be taken in response to the degraded conditions with continued operation are not met. End states are usually defined based on placing the unit into a mode or condition in which the TS LCO is not applicable. MODE 5 is the current end state for LCOs that are applicable in MODES 1 through 4. This change is acceptable because the risk of the transition from MODE 1 to MODES 4 or 5 depends on the availability of alternating current (AC) sources and the ability to remove decay heat such that remaining in MODE 4 may be safer. During the realignment from MODE 4 to MODE 5, there is an increased potential for loss of shutdown cooling and loss of inventory events. Decay heat removal following a loss-of-offsite power event in MODE 5 is dependent on

AC power for shutdown cooling whereas, in MODE 4, the turbine driven auxiliary feedwater (AFW) pump will be available. Therefore, transitioning to MODE 5 is not always the appropriate end state from a risk perspective. Thus, for specific conditions, Westinghouse Topical Report WCAP-16294-A R1 (ADAMS Accession No. ML103430249) justifies MODE 4 as an acceptable alternate end state to Mode 5. The proposed change to the Technical Specifications will allow time to perform short-duration repairs, which currently necessitate exiting the original mode of applicability. The MODE 4 Technical Specification end state is applied, and risk is assessed and managed in accordance with Title 10 of the Code of Federal Regulations (10 CFR) Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." This proposed change is consistent with NRC approved Technical Specification Task Force (TSTF) traveler TSTF-432-A Revision 1 (ADAMS Accession No. ML103360003), noticed for availability in the Federal Register (77 FR 27814) by the NRC on May 11, 2012. The NRC's approval of WCAP-16294-A included four limitations and conditions on its use as identified in Section 4.0 of the NRC Safety Evaluation associated with WCAP- 16294-A. Implementation of these stipulations were addressed in the Bases of TSTF-432-A. Florida Power & Light implemented these limitations and conditions at PTN in the adoption of the associated TSTF-432-A Bases. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

3.5.5 LCO 3.5.4 The RWST shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
ACTION B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
ACTION C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 4. ---------- Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
3.5.4.c 3.5.4.d 4.5.4.b	SR 3.5.4.1	----------NOTE---------- [Only required to be performed when ambient air temperature is < [35]°F or > [100]°F.] ---------- Verify RWST borated water temperature is ≥ [35]°F and ≤ [100]°F.	[24 hours OR In accordance with the Surveillance Frequency Control Program]
3.5.4.a 4.5.4.a.1	SR 3.5.4.2	Verify RWST borated water volume is ≥ [466,200 gallons ( )%].	[7 days OR In accordance with the Surveillance Frequency Control Program]
3.5.4.b 4.5.4.a.2	SR 3.5.4.3	Verify RWST boron concentration is ≥ [2000] ppm and ≤ [2200] ppm.	[7 days OR In accordance with the Surveillance Frequency Control Program]

1. 2. Not required to be performed until 23 hours after ambient air temperature is < 39°F or > 100°F.

S 9 9 320,000 2400 2600

1 1 3 1 1

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.4, REFUELING WATER STORAGE TANKS (RWST)

1. The Improved Standard Technical Specifications (ISTS) contain bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to be consistent with the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.4 Refueling Water Storage Tank (RWST)

BASES

BACKGROUND

The RWST supplies borated water to the Chemical and Volume Control System (CVCS) during abnormal operating conditions, to the refueling cavity ~~pool~~ during refueling, and to the ECCS and the Containment Spray System during accident conditions.

The RWST supplies ~~both trains of~~ the ECCS and the Containment Spray System through a common ~~separate, redundant~~ supply header~~s~~ during the injection phase of a loss of coolant accident (LOCA) recovery. ~~A~~ M~~m~~otor operated isolation valve~~s~~ ~~is~~ are provided in ~~each~~ the header to isolate the RWST from the ECCS once the system has been transferred to the recirculation mode. The recirculation mode is entered when pump suction is transferred to the containment sump following receipt of the RWST - Low Low ~~(~~Level~~-1)~~ signal. Use of a single RWST to supply ~~both trains of~~ the ECCS and Containment Spray System is acceptable since the RWST is a passive component, and passive failures are not required to be assumed to occur coincidentally with Design Basis Events.

~~The switchover from normal operation to the injection phase of ECCS operation requires changing centrifugal charging pump suction from the CVCS volume control tank (VCT) to the RWST through the use of isolation valves. Each set of isolation valves is interlocked so that the VCT isolation valves will begin to close once the RWST isolation valves are fully open. Since the VCT is under pressure, the preferred pump suction will be from the VCT until the tank is isolated. This will result in a delay in obtaining the RWST borated water. The effects of this delay are discussed in the Applicable Safety Analyses section of these Bases.~~

During normal operation in MODES 1, 2, and 3, the safety injection (SI) and residual heat removal (RHR) pumps are aligned to take suction from the RWST.

The ECCS and Containment Spray System pumps are provided with recirculation lines that ensure each pump can maintain minimum flow requirements when operating at or near shutoff head conditions.

When the suction for the ECCS and Containment Spray System pumps is transferred to the containment sump, the RWST flow paths must be isolated to prevent a release of the containment sump contents to the RWST, which could result in a release of contaminants to the atmosphere and the eventual loss of suction head for the ECCS pumps.

BASES

BACKGROUND (continued)

This LCO ensures that:

a. The RWST contains sufficient borated water to support the ECCS during the injection phase~~,~~ ;

b. Sufficient water volume exists in the containment sump to support continued operation of the ECCS and Containment Spray System pumps at the time of transfer to the recirculation mode of cooling, and ;

c. The reactor remains subcritical following a LOCA.

Insufficient water in the RWST could result in insufficient cooling capacity when the transfer to the recirculation mode occurs. Improper boron concentrations could result in a reduction of SDM or excessive boric acid precipitation in the core following the LOCA, as well as excessive caustic stress corrosion of mechanical components and systems inside the containment.

APPLICABLE SAFETY ANALYSES

During accident conditions, the RWST provides a source of borated water to the ECCS and Containment Spray System pumps. As such, it provides containment cooling and depressurization, core cooling, and replacement inventory and is a source of negative reactivity for reactor shutdown (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of B 3.5.2, "ECCS - Operating," B 3.5.3, "ECCS - Shutdown," and B 3.6.6, "Containment Spray and Cooling Systems." These analyses are used to assess changes to the RWST in order to evaluate their effects in relation to the acceptance limits in the analyses.

The RWST must also meet volume, boron concentration, and temperature requirements for non-LOCA events. The volume is not an explicit assumption in non-LOCA events since the required volume is a small fraction of the available volume. The deliverable volume limit is set by the LOCA and containment analyses. For the RWST, the deliverable volume is different from the total volume contained since, due to the design of the tank, more water can be contained than can be delivered. The minimum boron concentration is an explicit assumption in the main steam line break (MSLB) analysis to ensure the required shutdown capability. ~~The importance of its value is small for units with a boron injection tank (BIT) with a high boron concentration. For units with no BIT or reduced BIT boron requirements, the minimum boron concentration limit is an important assumption in ensuring the required shutdown~~

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~capability. The maximum boron concentration is an explicit assumption in the inadvertent ECCS actuation analysis, although it is typically a nonlimiting event and the results are very insensitive to boron concentrations.~~ The maximum temperature ensures that the amount of cooling provided from the RWST during the heatup phase of a ~~feedline break~~ is consistent with safety analysis assumptions; the minimum ~~is an assumption in both the MSLB and inadvertent ECCS actuation analyses, although the inadvertent ECCS actuation event is typically nonlimiting~~.

LOCA

RWST

RWST temperature is consistent with the LOCA and MSLB analysis

1

~~The MSLB analysis has considered a delay associated with the interlock between the VCT and RWST isolation valves, and the results show that the departure from nucleate boiling design basis is met. The delay has been established as [27] seconds, with offsite power available, or [37] seconds without offsite power. This response time includes [2] seconds for electronics delay, a [15] second stroke time for the RWST valves, and a [10] second stroke time for the VCT valves. Plants with a BIT need not be concerned with the delay since the BIT will supply highly borated water prior to RWST switchover, provided the BIT is between the pumps and the core.~~

1

Insert 1

For a large break LOCA analysis, the minimum water volume limit of ~~[466,200]~~ gallons and the lower boron concentration limit of ~~[2000]~~ ppm are used to compute the post LOCA sump boron concentration necessary to assure subcriticality. The large break LOCA is the limiting case since the safety analysis assumes that all control rods are out of the core.

320,000

2400

3

The upper limit on boron concentration of ~~[2200]~~ ppm is used to determine the maximum allowable time to switch to hot leg recirculation following a LOCA. The purpose of switching from cold leg to hot leg injection is to avoid boron precipitation in the core following the accident.

2600

3

In the ECCS analysis, the containment spray temperature is assumed to be equal to the RWST lower temperature limit of ~~[35]~~°F. If the lower temperature limit is violated, the containment spray further reduces containment pressure, which decreases the rate at which steam can be vented out the break and increases peak clad temperature. The upper temperature limit of ~~[~~100~~]~~°F is used in the small break LOCA analysis and containment OPERABILITY analysis. Exceeding this temperature will result in a higher peak clad temperature, because there is less heat transfer from the core to the injected water for the small break LOCA and higher containment pressures due to reduced containment spray cooling capacity. For the containment response following an MSLB, the lower

39

3

3

1

INSERT 1

The assumptions made in the LOCA analyses credit control rods for the SBLOCA and cold leg large break LOCA and do not credit control rods for the hot leg large break LOCA. For the Cold Leg Large Break LOCA, control rods are assumed inserted only at the time of hot leg switchover to provide the additional negative reactivity required to address concerns of potential core recriticality at the time.

BASES

APPLICABLE SAFETY ANALYSES (continued)

limit on boron concentration and the upper limit on RWST water temperature are used to maximize the total energy release to containment.

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

LCO

The RWST ensures that an adequate supply of borated water is available to cool and depressurize the containment in the event of a Design Basis Accident (DBA), to cool and cover the core in the event of a LOCA, to maintain the reactor subcritical following a DBA, and to ensure adequate level in the containment sump to support ECCS and Containment Spray System pump operation in the recirculation mode.

To be considered OPERABLE, the RWST must meet the water volume, boron concentration, and temperature limits established in the SRs.

APPLICABILITY

In MODES 1, 2, 3, and 4, RWST OPERABILITY requirements are dictated by ECCS and Containment Spray System OPERABILITY requirements. Since both the ECCS and the Containment Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the RWST must also be OPERABLE to support their operation. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level."

ACTIONS

A.1

With RWST boron concentration or borated water temperature not within limits, they must be returned to within limits within 8 hours. Under these conditions neither the ECCS nor the Containment Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE condition. The 8 hour limit to restore the RWST temperature or boron concentration to within limits was developed considering the time required to change either the boron concentration or temperature and the fact that the contents of the tank are still available for injection.

B.1

With the RWST inoperable for reasons other than Condition A (e.g., water volume), it must be restored to OPERABLE status within 1 hour.

BASES

ACTIONS (continued)

In this Condition, neither the ECCS nor the Containment Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the plant in a MODE in which the RWST is not required. The short time limit of 1 hour to restore the RWST to OPERABLE status is based on this condition ~~simultaneously affecting redundant trains~~.

1

C.1 and C.2

If the RWST cannot be returned to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which overall plant risk is reduced. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.

Remaining within the Applicability of the LCO is acceptable to accomplish short duration repairs to restore inoperable equipment because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 2). In MODE 4 the steam generators and Residual Heat Removal System are available to remove decay heat, which provides diversity and defense in depth. As stated in Reference 2, the steam turbine driven auxiliary feedwater pump must be available to remain in MODE 4. Should Steam Generator cooling be lost while relying on this Required Action, there are preplanned actions to ensure long-term decay heat removal. Voluntary entry into MODE 5 may be made as it is also acceptable from a risk perspective.

Required Action C.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

The RWST borated water temperature should be verified to be within the limits assumed in the accident analyses band. [The Frequency of 24 hours is sufficient to identify a temperature change that would approach either limit and has been shown to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

----------REVIEWER'S NOTE----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

The temperature of the RWST solution is consistent with the LOCA analysis. Portable instrumentation may be used to monitor the RWST temperature.

3

4

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperatures are within the operating limits of the RWST. With ambient air temperatures within the band, the RWST temperature should not exceed the limits.

SR 3.5.4.2

The RWST water volume should be verified to be above the required minimum level in order to ensure that a sufficient initial supply is available for injection and to support continued ECCS and Containment Spray System pump operation on recirculation. [Since the RWST volume is normally stable and is protected by an alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

3

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

----------REVIEWER'S NOTE----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

4

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.3

The boron concentration of the RWST should be verified to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. [Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

----------REVIEWER'S NOTE----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

REFERENCES

1. FSAR, Chapter [6] and Chapter [15].

2. WCAP-16294-NP-A, Rev. 1, "Risk-Informed Evaluation of Changes to Technical Specification Required Action Endstates for Westinghouse NSSS PWRs," June 2010.

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.4 BASES, REFUELING WATER STORAGE TANK (RWST)

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Changes are made to reflect those changes made to the Specification. Subsequent requirements are renumbered or revised, where applicable, to reflect the changes.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.5.4, REFUELING WATER STORAGE TANK

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 5

Relocated/Deleted Current Technical Specifications (CTS)

None

ATTACHMENT 6

Improved Standard Technical Specifications (ISTS) Not Adopted in the Turkey Point ITS

- ISTS 3.5.5 – Seal Injection Flow
- ISTS 3.5.6 – Boron Injection Tank (BIT)

ISTS 3.5.5, SEAL INJECTION FLOW

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow [resistance] shall be [≤ [40] gpm with [centrifugal charging pump discharge header] pressure ≥ [2480] psig and the [charging flow] control valve full open or ≥ [0.2117] ft/gpm2 or within the limits of Figure 3.5.5-1].

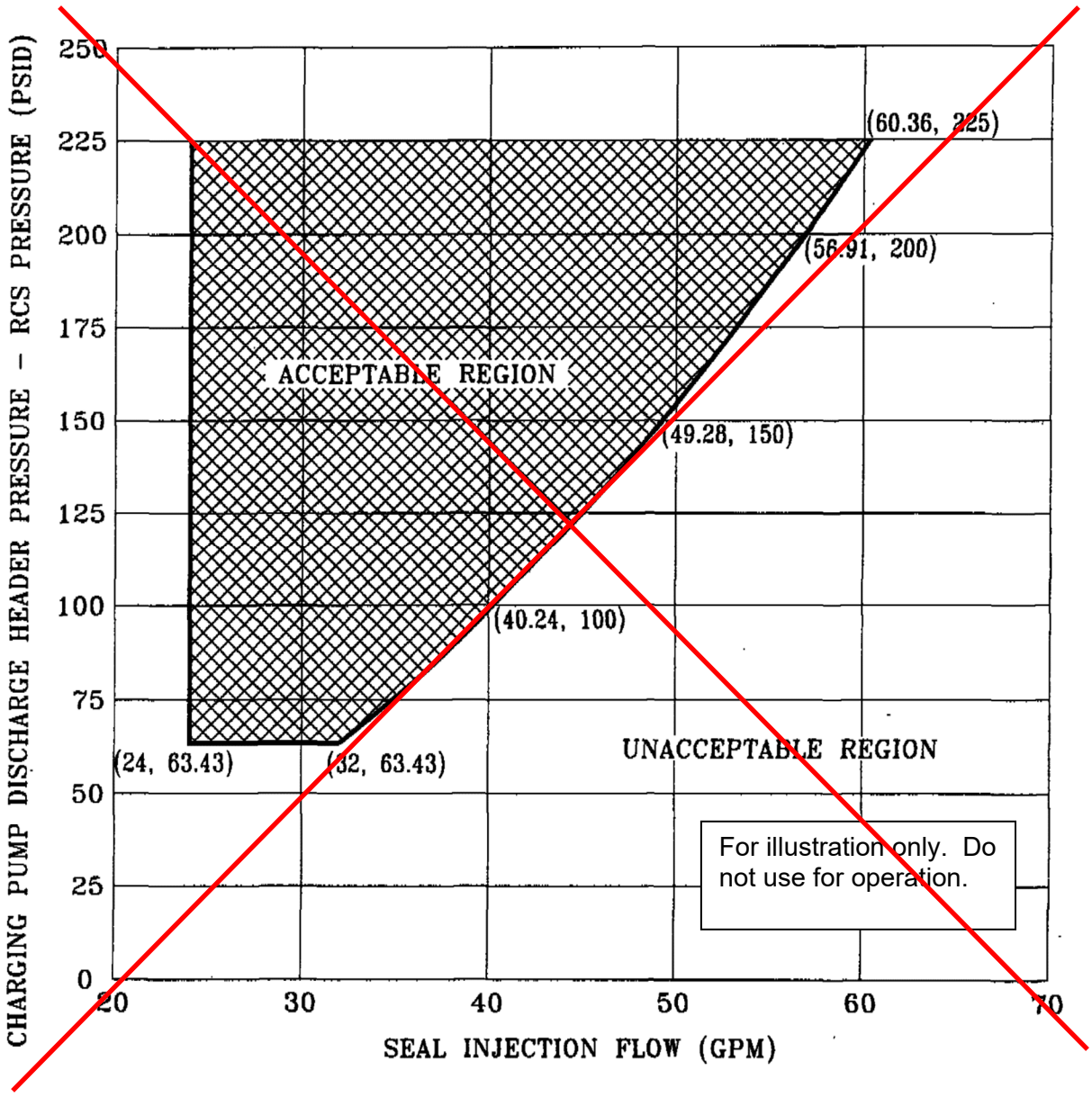
APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow [resistance] not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow [resistance] within limit.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	----------NOTE---------- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ [2215 psig and ≤ 2255 psig]. ----------	
	Verify manual seal injection throttle valves are adjusted to give a flow [resistance] [of ≤ [40 gpm] with [centrifugal charging pump discharge header] pressure ≥ [2480] psig and the [charging flow] control valve full open or ≥ [0.2117] ft/gpm2 or within the limit of Figure 3.5.5-1.]	[31 days OR In accordance with the Surveillance Frequency Control Program]



~~Figure 3.5.5-1 (page 1 of 1)~~
~~Seal Injection Flow Limits~~

JUSTIFICATION FOR DEVIATIONS
ISTS 3.5.5, SEAL INJECTION FLOW

1. Improved Standard Technical Specification (ISTS) 3.5.5, "Seal Injection Flow," is not being adopted because Turkey Point Nuclear Generating Station (PTN) design does not use the centrifugal charging pumps for safety injection (SI). Therefore, ISTS 3.5.5 is not included in the PTN Improved Technical Specifications (ITS).

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.5 Seal Injection Flow

BASES

BACKGROUND

This LCO is applicable only to those units that utilize the centrifugal charging pumps for safety injection (SI). The function of the seal injection throttle valves during an accident is similar to the function of the ECCS throttle valves in that each restricts flow from the centrifugal charging pump header to the Reactor Coolant System (RCS).

The restriction on reactor coolant pump (RCP) seal injection flow limits the amount of ECCS flow that would be diverted from the injection path following an accident. This limit is based on safety analysis assumptions that are required because RCP seal injection flow is not isolated during SI.

The RCP seal injection flow is restricted by the seal injection line flow [resistance] which is adjusted through positioning of the manual RCP seal injection throttle valves. The RCP seal injection flow [resistance] is determined by measuring the pressurizer pressure, the centrifugal charging pump discharge header pressure, and the RCP seal injection flow rate.

The charging flow control valve throttles the centrifugal charging pump discharge header flow as necessary to maintain the programmed level in the pressurizer. The charging flow control valve fails open to ensure that, in the event of either loss of air or loss of control signal to the valve, when the centrifugal charging pumps are supplying charging flow, seal injection flow to the RCP seals is maintained. Positioning of the charging flow control valve may vary during normal plant operating conditions, resulting in a proportional change to RCP seal injection flow. The flow [resistance] provided by RCP seal injection throttle valves will remain fixed when the charging flow control valve is repositioned provided the throttle valve(s) position are not adjusted.

APPLICABLE SAFETY ANALYSES

All ECCS subsystems are taken credit for in the large break loss of coolant accident (LOCA) at full power (Ref. 1). The LOCA analysis establishes the minimum flow for the ECCS pumps. The centrifugal charging pumps are also credited in the small break LOCA analysis. This analysis establishes the flow and discharge head at the design point for the centrifugal charging pumps. The steam generator tube rupture and main steam line break event analyses also credit the centrifugal charging pumps, but are not limiting in their design. Reference to these analyses is made in assessing changes to the Seal Injection System for evaluation of their effects in relation to the acceptance limits in these analyses.

BASES

APPLICABLE SAFETY ANALYSES (continued)

This LCO ensures that seal injection flow [resistance] will be sufficient for RCP seal integrity but limited so that the ECCS trains will be capable of delivering sufficient water to match boiloff rates soon enough to minimize uncovering of the core following a large LOCA. It also ensures that the centrifugal charging pumps will deliver sufficient water for a small LOCA and sufficient boron to maintain the core subcritical. For smaller LOCAs, the charging pumps alone deliver sufficient fluid to overcome the loss and maintain RCS inventory. Seal injection flow satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO The intent of the LCO limit on seal injection flow is to make sure that flow through the RCP seal water injection line is low enough to ensure that sufficient centrifugal charging pump injection flow is directed to the RCS via the injection points (Ref. 2).

[The LCO is not strictly a flow limit, but rather a flow limit based on a flow line resistance. In order to establish the proper flow line resistance, a pressure and flow must be known. The flow line resistance is determined by assuming that the RCS pressure is at normal operating pressure and that the centrifugal charging pump discharge pressure is greater than or equal to the value specified in this LCO. The centrifugal charging pump discharge header pressure remains essentially constant through all the applicable MODES of this LCO. A reduction in RCS pressure would result in more flow being diverted to the RCP seal injection line than at normal operating pressure. The valve settings established at the prescribed centrifugal charging pump discharge header pressure result in a conservative valve position should RCS pressure decrease. The additional modifier of this LCO, the control valve (charging flow for four loop units and air operated seal injection for three loop units) being full open, is required since the valve is designed to fail open for the accident condition. With the discharge pressure and control valve position as specified by the LCO, a flow limit is established. It is this flow limit that is used in the accident analyses.

OR

This is accomplished by limiting the seal injection line resistance to a value consistent with the assumptions in the accident analysis. The limit on RCP seal injection flow resistance must be met to assure that the ECCS is OPERABLE. If this limit is not met, the ECCS flow may not be as assumed in the accident analysis. The restriction on seal injection flow is accomplished by maintaining the seal water injection flow resistance ≥ [0.2117] ft/gpm2. With the seal injection flow resistances within limit, the resulting total seal injection flow will be within the assumptions made for seal flow during accident conditions.

BASES

LCO (continued)

In order to establish the proper flow line resistance, the centrifugal charging pump discharge header pressure, the RCP seal injection flow rate, and the pressurizer pressure are measured. The line resistance is then determined from those inputs. A reduction in RCP pressure with no concurrent decrease in centrifugal charging pump discharge header pressure would increase the differential pressure across the manual throttle valves, and result in more flow being discharged through the RCP seal injection line. The flow resistance limit assures that when RCS pressure drops during a LOCA and seal injection flow increases in response to the higher differential pressure, the resulting flow will be consistent with the accident analysis.

OR

The LCO is not strictly a flow limit, but rather a flow limit based on a flow line resistance. In order to establish the proper flow line resistance, a pressure and flow must be known. The flow line resistance is established by adjusting the RCP seal injection flow in the acceptable region of Figure 3.5.5-1 at a given pressure differential between the charging header and the RCS. The centrifugal charging pump discharge header pressure remains essentially constant through all the applicable MODES of this LCO. A reduction in RCS pressure would result in more flow being diverted to the RCP seal injection line than at normal operating pressure. The valve settings established at the prescribed centrifugal charging pump discharge header pressure result in a conservative valve position should RCS pressure decrease. The flow limits established by Figure 3.5.5-1 ensures that the minimum ECCS flow assumed in the safety analyses is maintained.]

The limit on seal injection flow [resistance] must be met to render the ECCS OPERABLE. If these conditions are not met, the ECCS flow will not be as assumed in the accident analyses.

APPLICABILITY In MODES 1, 2, and 3, the seal injection flow [resistance] limit is dictated by ECCS flow requirements, which are specified for MODES 1, 2, 3, and 4. The seal injection flow [resistance] limit is not applicable for MODE 4 and lower, however, because high seal injection flow is less critical as a result of the lower initial RCS pressure and decay heat removal requirements in these MODES. Therefore, RCP seal injection flow [resistance] must be limited in MODES 1, 2, and 3 to ensure adequate ECCS performance.

BASES

ACTIONS A.1

With the seal injection flow [resistance] not within its limit, the amount of charging flow available to the RCS may be reduced. Under this Condition, action must be taken to restore the flow [resistance] to within its limit. The operator has 4 hours from the time the flow [resistance] is known to not be within the limit to correctly position the manual valves and thus be in compliance with the accident analysis. The Completion Time minimizes the potential exposure of the plant to a LOCA with insufficient injection flow and provides a reasonable time to restore seal injection flow [resistance] within limits. This time is conservative with respect to the Completion Times of other ECCS LCOs; it is based on operating experience and is sufficient for taking corrective actions by operations personnel.

B.1 and B.2

When the Required Actions cannot be completed within the required Completion Time, a controlled shutdown must be initiated. The Completion Time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown begun in Required Action B.1, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4, where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS SR 3.5.5.1

Verification that the manual seal injection throttle valves are adjusted to give a flow [resistance] within the limit ensures that the ECCS injection flows stay within the safety analysis. A differential pressure is established between the charging header and the RCS, and the total seal injection flow is verified to within the limit determined in accordance with the ECCS safety analysis. [The flow [resistance] shall be verified by confirming seal injection flow ≤ [40] gpm with the RCS at normal operating pressure, the charging flow control valve full open, and the charging header pressure ≥ [2480].

OR

The flow [resistance] shall be verified by confirming seal injection flow and differential pressure within the acceptable region of Figure 3.5.5-1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR

The flow resistance shall be ≥ [0.2117] ft/gpm2.] Control valves in the flow path between the charging header and the RCS pressure sensing points must be in their post accident position (e.g., charging flow control valve open) during this Surveillance to correlate with the acceptance criteria.

[The Frequency of 31 days is based on engineering judgment and is consistent with other ECCS valve Surveillance Frequencies. The Frequency has proven to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

---------- REVIEWER'S NOTE ----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

As noted, the Surveillance is not required to be performed until 4 hours after the RCS pressure has stabilized within a ± 20 psig range of normal operating pressure. The RCS pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual valves are set correctly. The exception is limited to 4 hours to ensure that the Surveillance is timely.

REFERENCES 1. FSAR, Chapter [6] and Chapter [15].

2. 10 CFR 50.46.

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.5 BASES, SEAL INJECTION FLOW

1. Improved Standard Technical Specification (ISTS) 3.5.5 Bases, "Seal Injection Flow," is not included in the Turkey Point Nuclear Generating Station (PTN) Improved Technical Specifications (ITS) because this Specification, ISTS 3.5.5, does not exist in the PTN current technical specifications.

ISTS 3.5.6, BORON INJECTION TANK (BIT)

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 Boron Injection Tank (BIT)

LCO 3.5.6 The BIT shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. BIT inoperable.	A.1 Restore BIT to OPERABLE status.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Borate to SDM specified in COLR. AND B.3 Restore BIT to OPERABLE status.	6 hours 6 hours 7 days
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 4.	12 hours

1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	Verify BIT borated water temperature is ≥ [145]°F.	[24 hours OR In accordance with the Surveillance Frequency Control Program]
SR 3.5.6.2	[Verify BIT borated water volume is ≥ [1100] gallons.	[7 days OR In accordance with the Surveillance Frequency Control Program]]
SR 3.5.6.3	Verify BIT boron concentration is ≥ [20,000] ppm and ≤ [22,500] ppm.	[7 days OR In accordance with the Surveillance Frequency Control Program]

1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.5.6, BORON INJECTION TANK (BIT)

1. Improved Standard Technical Specification (ISTS) 3.5.6, "Boron Injection Tank (BIT)," is not being adopted because Turkey Point Nuclear Generating Station (PTN) design does not include the BIT. Therefore, ISTS 3.5.6 is not included in the ITS.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.6 Boron Injection Tank (BIT)

BASES

BACKGROUND

The BIT is part of the Boron Injection System, which is the primary means of quickly introducing negative reactivity into the Reactor Coolant System (RCS) on a safety injection (SI) signal.

The main flow path through the Boron Injection System is from the discharge of the centrifugal charging pumps through lines equipped with a flow element and two valves in parallel that open on an SI signal. The valves can be operated from the main control board. The valves and flow elements have main control board indications. Downstream of these valves, the flow enters the BIT (Ref. 1).

The BIT is a stainless steel tank containing concentrated boric acid. Two trains of strip heaters are mounted on the tank to keep the temperature of the boric acid solution above the precipitation point. The strip heaters are controlled by temperature elements located near the bottom of the BIT. The temperature elements also activate High and Low alarms on the main control board. In addition to the strip heaters on the BIT, there is a recirculation system with a heat tracing system, including the piping section between the motor operated isolation valves, which further ensures that the boric acid stays in solution. The BIT is also equipped with a High Pressure alarm on the main control board. The entire contents of the BIT are injected when required; thus, the contained and deliverable volumes are the same.

1

During normal operation, one of the two BIT recirculation pumps takes suction from the boron injection surge tank (BIST) and discharges to the BIT. The solution then returns to the BIST. Normally, one pump is running and one is shut off. On receipt of an SI signal, the running pump shuts off and the air operated valves close. Flow to the BIT is then supplied from the centrifugal charging pumps. The solution of the BIT is injected into the RCS through the RCS cold legs.

APPLICABLE SAFETY ANALYSES

During a main steam line break (MSLB) or loss of coolant accident (LOCA), the BIT provides an immediate source of concentrated boric acid that quickly introduces negative reactivity into the RCS.

The contents of the BIT are not credited for core cooling or immediate boration in the LOCA analysis, but for post LOCA recovery. The BIT maximum boron concentration of [22,500] ppm is used to determine the minimum time for hot leg recirculation switchover. The minimum boron

BASES

APPLICABLE SAFETY ANALYSES (continued)

concentration of [20,000] ppm is used to determine the minimum mixed mean sump boron concentration for post LOCA shutdown requirements.

For the MSLB analysis, the BIT is the primary mechanism for injecting boron into the core to counteract any positive increases in reactivity caused by an RCS cooldown. The analysis uses the minimum boron concentration of the BIT, which also affects both the departure from nucleate boiling and containment design analyses. Reference to the LOCA and MSLB analyses is used to assess changes to the BIT to evaluate their effect on the acceptance limits contained in these analyses.

The minimum temperature limit of [145]°F for the BIT ensures that the solution does not reach the boric acid precipitation point. The temperature of the solution is monitored and alarmed on the main control board.

The BIT boron concentration limits are established to ensure that the core remains subcritical during post LOCA recovery. The BIT will counteract any positive increases in reactivity caused by an RCS cooldown.

1

The BIT minimum water volume limit of [1100] gallons is used to ensure that the appropriate quantity of highly borated water with sufficient negative reactivity is injected into the RCS to shut down the core following an MSLB, to determine the hot leg recirculation switchover time, and to safeguard against boron precipitation.

The BIT satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum requirements for contained volume, boron concentration, and temperature of the BIT inventory (Ref. 2). This ensures that an adequate supply of borated water is available in the event of a LOCA or MSLB to maintain the reactor subcritical following these accidents.

To be considered OPERABLE, the limits established in the SR for water volume, boron concentration, and temperature must be met.

If the equipment used to verify BIT parameters (temperature, volume, and boron concentration) is determined to be inoperable, then the BIT is also inoperable.

BASES

APPLICABILITY In MODES 1, 2, and 3, the BIT OPERABILITY requirements are consistent with those of LCO 3.5.2, "ECCS - Operating."

In MODES 4, 5, and 6, the respective accidents are less severe, so the BIT is not required in these lower MODES.

ACTIONS A.1

If the required volume is not present in the BIT, both the hot leg recirculation switchover time analysis and the boron precipitation analysis would not be met. Under these conditions, prompt action must be taken to restore the volume to above its required limit to declare the tank OPERABLE, or the plant must be placed in a MODE in which the BIT is not required.

The BIT boron concentration is considered in the hot leg recirculation switchover time analysis, the boron precipitation analysis, and the reactivity analysis for an MSLB. If the concentration were not within the required limits, these analyses could not be relied on. Under these conditions, prompt action must be taken to restore the concentration to within its required limits, or the plant must be placed in a MODE in which the BIT is not required.

1

The BIT temperature limit is established to ensure that the solution does not reach the boric acid crystallization point. If the temperature of the solution drops below the minimum, prompt action must be taken to raise the temperature and declare the tank OPERABLE, or the plant must be placed in a MODE in which the BIT is not required.

The 1 hour Completion Time to restore the BIT to OPERABLE status is consistent with other Completion Times established for loss of a safety function and ensures that the plant will not operate for long periods outside of the safety analyses.

B.1, B.2, and B.3

When Required Action A.1 cannot be completed within the required Completion Time, a controlled shutdown should be initiated. Six hours is a reasonable time, based on operating experience, to reach MODE 3 from full power conditions and to be borated to the required SDM without challenging plant systems or operators. Borating to the required SDM assures that the plant is in a safe condition, without need for any additional boration.

BASES

ACTIONS (continued)

After determining that the BIT is inoperable and the Required Actions of B.1 and B.2 have been completed, the tank must be returned to OPERABLE status within 7 days. These actions ensure that the plant will not be operated with an inoperable BIT for a lengthy period of time. It should be noted, however, that changes to applicable MODES cannot be made until the BIT is restored to OPERABLE status pursuant to the provisions of LCO 3.0.4.

C.1

Even though the RCS has been borated to a safe and stable condition as a result of Required Action B.2, either the BIT must be restored to OPERABLE status (Required Action C.1) or the plant must be placed in a condition in which the BIT is not required (MODE 4). The 12 hour Completion Time to reach MODE 4 is reasonable, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators.

1

SURVEILLANCE REQUIREMENTS

SR 3.5.6.1

Verification that the BIT water temperature is at or above the specified minimum temperature will identify a temperature change that would approach the acceptable limit. The solution temperature is also monitored by an alarm that provides further assurance of protection against low temperature. [The Frequency of 24 hours has been shown to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

----------REVIEWER'S NOTE----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.6.2

Verification that the BIT contained volume is above the required limit assures that this volume will be available for quick injection into the RCS. If the volume is too low, the BIT would not provide enough borated water to ensure subcriticality during recirculation or to shut down the core following an MSLB. [Since the BIT volume is normally stable, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

----------REVIEWER'S NOTE----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

1

SR 3.5.6.3

Verification that the boron concentration of the BIT is within the required band ensures that the reactor remains subcritical following a LOCA; it limits return to power following an MSLB, and maintains the resulting sump pH in an acceptable range so that boron precipitation will not occur in the core. In addition, the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized.

The BIT is in a recirculation loop that provides continuous circulation of the boric acid solution through the BIT and the boric acid tank (BAT). There are a number of points along the recirculation loop where local samples can be taken. The actual location used to take a sample of the solution is specified in the plant Surveillance procedures. Sampling from the BAT to verify the concentration of the BIT is not recommended, since this sample may not be homogenous and the boron concentration of the two tanks may differ.

The sample should be taken from the BIT or from a point in the flow path of the BIT recirculation loop.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[The Frequency of 7 days is appropriate and has been shown to be acceptable through operating experience.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

---------- REVIEWER'S NOTE ----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
----------]

REFERENCES 1. FSAR, Chapter [6] and Chapter [15].

2. 10 CFR 50.46.

1

JUSTIFICATION FOR DEVIATIONS
ITS 3.5.6 BASES, BORON INJECTION TANK (BIT)

1. Improved Standard Technical Specification (ISTS) 3.5.6 Bases, "Boron Injection Tank (BIT)," is not included in the Turkey Point Nuclear Generating Station (PTN) Improved Technical Specifications (ITS) since the Specification, ISTS 3.5.6, has not been included in the PTN ITS.