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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Ref 10 CFR 50.90
10 CFR 50.91(a)(6)
10 CFR 50.91(b)(1)

Subject: Comanche Peak Nuclear Power Plant (CPNPP)
Docket Nos. 50-445 and 50-446
Supplement to License Amendment Request (LAR) 20-006
APPLICATION TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT RISK INFORMED COMPLETION TIMES, TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES – RITSTF INITIATIVE 4b (Accession No. ML21131A233)"

Reference:

1. Letter TXX-21046 from Thomas P. McCool to the NRC, License Amendment Request (LAR) 20-006, APPLICATION TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT RISK INFORMED COMPLETION TIMES, TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES - RITSTF INITIATIVE 4b," dated May 11, 2021 (Accession No. ML21131A233)
2. Letter from Dennis Galvin to Ken Peters, SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION RE: LICENSE AMENDMENT REQUEST TO ADOPT TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES - RITSTF INITIATIVE 4b" (EPID L-2021-LLA-0085) (Accession Number: ML21166A338)

Dear Sir or Madam:

Pursuant to 10 CFR 50.90 and 10 CFR 50.91, Vistra Operations Company LLC (Vistra OpCo) hereby submits a supplement to the license amendment request for the Comanche Peak Nuclear Power Plant (CPNPP) Unit 1 and Unit 2 Technical Specifications in connection with LAR 20-006, Revision to multiple specifications as requested in Reference 1. This change supplement applies to both units.

This submittal addresses information requested by Reference 2 and supplements the proposed amendment that would modify Technical Specifications (TS) requirements for CPNPP to permit the use of Risk Informed Completion Times in accordance with TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b", (ADAMS Accession No. ML18183A493). A model safety evaluation was provided by the NRC to the TSTF on November 21, 2018 (ADAMS Accession No. ML18267A259). This supplement includes the following additional information:

- Executive Summary for Supplement
- Attachment 1 provides a revised Description and Assessment

- Attachment 2 provides revised proposed Technical Specification changes
- Attachment 4 provides a revised Cross Reference between TSTF-505, Revision 2 and CPNPP Technical Specifications proposed changes
- Enclosure 1 provides a revised List of Required Actions to Corresponding PRA Functions
  - Table E1-1 - In Scope TS/LCO Conditions to Corresponding PRA Functions
  - Table E1-2 - In Scope TS/LCO Conditions RICT Estimates
  - Table E1-3 - Conditions Requiring Additional Technical Justification
  - Table E1-4 - Evaluation of Instrumentation and Control Systems
  - Table E1-5 - Reactor Trip System (RTS) Instrumentation Functions
  - Table E1-6 - Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions
  - Table E1-7 - Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions
  - Table E1-8 - Event Protection and Diverse Functions
- Enclosure 7 provides a revised description of the PRA Model Update Process

Attachments 1, 2, and 4 and Enclosures 1 and 7 of letter TXX-21093 replace the corresponding Attachments and Enclosures of letter TXX-21046 (Accession Number: ML21131A233). Attachment 3, Enclosures 2 through 6, and Enclosures 8 through 12 of TXX-21046 remain valid.

In accordance with 10 CFR 50.91(b)(1), a copy of the supplement for the proposed license amendment is being forwarded to the State of Texas.

Vistra OpCo has determined that this supplement does not change the No Significant Hazards Consideration provided in the Enclosure submitted by Reference 1.

This communication contains no new commitments regarding CPNPP Units 1 and 2.

Should you have any questions, please contact Garry Struble at (254) 897-6628 or Garry.Struble@luminant.com.

I state under penalty of perjury that the foregoing is true and correct.

Executed on July 13, 2021.

Sincerely,

Thomas P. McCool

Executive Summary: Supplement to License Amendment Request (LAR) 20-006 RICT

Attachments:
1. Description and Assessment
2. Proposed Technical Specification pages (markup)
4. Cross-Reference of TSTF-505 and CPNPP Technical Specifications

Enclosures:
1. List of Required Actions to Corresponding PRA Functions

Tables:
- E1-1 In Scope TS/LCO Conditions to Corresponding PRA Functions
- E1-2 In Scope TS/LCO Conditions RICT Estimate
- E1-3 Conditions Requiring Additional Technical Justification
- E1-4 Evaluation of Instrumentation and Control Systems
- E1-5 Reactor Trip System (RTS) Instrumentation Functions
- E1-6 Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions
- E1-7 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions
- E1-8 Event Protection and Diverse Functions

7. PRA Model Update Process

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SUPPLEMENT to LICENSE AMENDMENT REQUEST (LAR) 20-006 APPLICATION TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT RISK INFORMED COMPLETION TIMES, TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES - RITSTF INITIATIVE 4b"
[Original submittal is found under Accession Number: ML21131A233]

Executive Summary

The following items describe the supplemental changes to the original LAR submittal based on information received by letter on June 22, 2021 to the Licensee (Vistra Operations Company LLC (Vistra OpCo)) from the Nuclear Regulatory Commission (Accession No. ML21166A363).

NRC Acceptance Review Information Insufficiencies (ARII) and CPNPP Response

NRC ARII 1

LAR Enclosure 7, "PRA [Probabilistic Risk Assessment] Model Update Process," Section 2.2, "Review of Plant Changes for Incorporation into the PRA Model," Item 3 proposes a standard frequency of 48 months for PRA model updates; however, Nuclear Energy Institute (NEI) report NEI 06-09, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Section 2.3.4, "PRA Technical Adequacy," Item 7.1 (ADAMS Package Accession No. ML122860402) states that the PRA shall be maintained and updated on a periodic basis not to exceed two refueling cycles. Comanche Peak has a nominal 18-month refueling cycle which, according to NEI 06-09, should bound the PRA update to every 36 months. Provide an explanation and justification for the inconsistency between the PRA model update frequency proposed in the LAR and frequency in NEI 06-09.

CPNPP ARII 1 - Response

Comanche Peak Nuclear Power Plant (CPNPP) contends that our PRA update process complies with NEI 06-09-A, Section 2.3.5, Item 9.1 as follows;

CPNPP is a dual unit facility with a common PRA for both units as stated in Enclosure 7, Section 2.2.3. In order to capture input from both units across two refueling cycles it could take between 42 and 45 months based on variations in operating cycles. With CPNPP periodic basis at 48 months we ensure that the update includes two refueling cycles for each unit while not exceeding two refueling cycles on either unit. Section 2.2.3 of Enclosure 7 to TXX-21093 is updated to reflect this information.

NRC ARII 2

LAR Enclosure 1, "List of Revised Required Actions to Corresponding PRA Functions," Table E1-1, "In Scope TS/LCO [Technical Specification/Limiting Condition of Operation] to Corresponding PRA [Probabilistic Risk Assessment] Functions,' does not provide information on the PRA success criteria for TS Condition 3.7.4.C, "Three or more

required ARV [atmospheric relief valve] lines inoperable." Provide the applicable PRA success criteria.

CPNPP ARII 2 - Response

This item is an error of omission, please refer to attached updated Enclosure 1, Table E1-1. The updated Table E1-1 also includes revision to TS 3.7.4.A and 3.7.4.B. All three Condition's PRA Success Criteria are, "One of four for Transient / SGTR."

NRC ARII 3

LAR Enclosure 1, Table E1-2, "In Scope TS/LCO Conditions RICT [Risk-Informed Completion Time] Estimate," does not provide a RICT estimate for TS Condition 3.4.9.B, "One required group of pressurizer heaters inoperable." Provide a RICT for this TS.

CPNPP ARII 3 - Response

This item is an error of omission, please refer to attached updated Enclosure 1, Table E1-2. The updated Table E1-2 states "30 days" as the RICT estimate.

NRC ARII 4

The LAR does not address "what redundant or diverse means were available to assist the licensee in responding to various plant conditions." This LAR does not provide a defense-in-depth assessment to address these guidelines for each proposed RICT TS. Describe the defense-in-depth for instrumentation and control features per the guidelines in TSTF-505, Revision 2, Enclosure 1.

CPNPP ARII 4 - Response

The approach taken was to include this information in Attachment 1, pages 7 through 12. There is also supporting information found in Attachment 4, Comments. CPNPP includes the information in updated Enclosure 1, by adding Table E1-3, Conditions Requiring Additional Technical Justification as an attachment to this supplement. Enclosure 1 and associated tables have been revised to include details of the redundancy, independence, diversity, and defense-in-depth of the instrumentation Functions.

NRC ARII 5

The licensee stated in this LAR that "[t]he proposed amendment is consistent with TSTF-505, Revision 2. TSTF-505, Revision 2 excludes loss of function (LOF) conditions, in which there is insufficient operable equipment to meet the safety function of the system, from the RICT program.

The NRC staff identified TS Conditions that appear to include LOF based on the data in columns "Tech Spec Description" and "Design Success Criteria" in Table E1-1;

- *3.3.1.P One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.*
- *3.3.5.B Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.*

- *3.3.5.C Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.*
- *3.3.5.D Two channels per bus for the 6.9 kV [kilovolt] bus loss of voltage function inoperable.*
- *3.3.5.E Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable.*
- *3.3.5.F One or more Automatic Actuation Logic and Actuation Relays trains inoperable.*
- *3.4.11.C One block valve inoperable.*
- *3.7.4.C Three or more required ARV lines inoperable.*

CPNPP ARII 5 - Response

- 3.3.1.P, One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.

  From CPNPP TS Bases;

  This trip Function will not and is not required to operate in the presence of a single channel failure. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure-High trip Function, and RCS integrity is ensured by the pressurizer safety valves. This trip Function is diverse to the Turbine Trip-Low Fluid Oil Pressure trip Function. Each turbine stop valve is equipped with one limit switch that inputs to the RTS. If all four limit switches indicate that the stop valves are all closed, a reactor trip is initiated.

  These channels also are not a Support System for the Reactor Trip System (RTS) and as such they are not an input into the Safety Function Determination Program (SFDP). This shows that there is no loss of safety function due to the "one or more" verbiage.

- 3.3.5.B, Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.
- 3.3.5.C, Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.
- 3.3.5.D, Two channels per bus for the 6.9kV bus loss of voltage function inoperable.
- 3.3.5.E, Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable.

From CPNPP TS Bases;

Each of the above groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals...

The LOP DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power or degraded power system. Its design basis is that of the ESF Actuation System (ESFAS).

In other words, the LOP DG Start Instrumentation is a support system for each Emergency Diesel Generator (EDG) in TS 3.8.1, AC Sources -- Operating. This group of Conditions is the picture of diverse instrumentation in that they all lead to an automatic start of the EDGs, if needed (loss of all offsite power or degraded voltage) while still allowing automatic actions to maintain or restore AC power without an EDG start. The EDGs may also be started from the Control Room or locally if the LOP DG Start Instrumentation is not available. The two-out-of-two coincidence is required to actuate a response which is bus related. That leaves the other bus to provide the safety function. The application of the RICT for Conditions B, C, D, and E only changes the Completion Time based on risk. There is no change in the safety function status due to the extended Completion Time.

Enclosure 1 and Attachment 2 to the original submittal have been revised to address the identified issues.

- 3.3.5.F, One or more Automatic Actuation Logic and Actuation Relays trains inoperable.

This Condition is like TS 3.3.2.C in that the circuitry for LOP DG Start Instrumentation was part of the Engineered Safety Feature (ESF) Actuation System. Under that prior Technical Specification (3/4.3.2, Engineered Safety Features Actuation System Instrumentation) Automatic Action Logic and Actuation Relays appear in the following Functions;

1.b Safety Injection - Automatic Action Logic and Actuation Relays

2.b Containment Spray - Automatic Action Logic and Actuation Relays

3.a.2 Containment Isolation - Phase "A" Isolation - Automatic Action Logic and Actuation Relays

3.b.2 Containment Isolation - Phase "B" Isolation - Automatic Action Logic and Actuation Relays

3.c.2 Containment Isolation - Containment Vent Isolation - Automatic Action Logic and Actuation Relays

4.b Steam Line Isolation - Automatic Action Logic and Actuation Relays

5.a Turbine Trip & Feedwater Isolation - Automatic Action Logic and Actuation Relays

6.a Auxiliary Feedwater - Automatic Action Logic and Actuation Relays

7.a Automatic Initiation of ECCS Switchover to Containment Sump - Automatic Action Logic and Actuation Relays

The Safety Injection Function 1.b always has the manual backup of Function 1.a which provides a diversity of actuation methods. Current TS 3.3.2, ESFAS Instrumentation allows 24 hours to recover a single train inoperable via Conditions C, G, and H for Automatic Action Logic and Actuation Relays. If both trains are inoperable then LCO 3.8.1, Condition E will be entered. The required action is to restore one DG to OPERABLE status in 2 hours.

In TS 3.3.5, LOP DG Start Instrumentation Condition F for one or more Automatic Action Logic and Actuation Relays trains inoperable provides 1 hour to restore the inoperable train(s). If not restored in 1 hour, immediately declared associated DG(s) inoperable in accordance with TS 3.8.1. This is only a loss of safety function if all AC sources are declared inoperable, TS 3.8.1 addresses that condition. The RICT would only extend the Completion Time prior to declaring a DG inoperable if supported by risk analysis. Keeping a unit online when a known remedy exists for the LOP DG Start system may be in the public's best interest.

- 3.4.11.C One block valve inoperable.

From CPNPP TS Bases;

LCO 3.4.11, Pressurizer PORVs requires the PORVs and their associated block valves to be OPERABLE for manual operation to mitigate the effects associated with an SGTR.

By maintaining two PORVs and their associated block valves OPERABLE, the single failure criterion is satisfied. An OPERABLE block valve may be either open or closed and energized with the capability to be opened, since the required safety function is accomplished by manual operation. Although typically open to allow PORV operation, the block valves may be OPERABLE while closed to isolate the flow path of an inoperable PORV that is capable of being manually cycled (e.g., as in the case of excessive PORV leakage). Similarly, isolation of an OPERABLE PORV does not render the PORV or the block valve inoperable provided the relief function remains available with manual action.

If one block valve is inoperable, then it is necessary to either restore the block valve to OPERABLE status within the Completion Time of 1 hour or place the associated PORV in manual control. The prime importance for the capability to close the block valve is to isolate a stuck open PORV. Therefore, if the block valve cannot be restored to OPERABLE status within 1 hour, the Required Action is to place the PORV in manual control to preclude its automatic opening for an overpressure event and to avoid the potential for a stuck open PORV at a time that the block valve is inoperable. The Completion Time of 1 hour is reasonable, based on the small potential for challenges to the system during this time period, and provides the operator time to correct the situation. Because at least one PORV remains OPERABLE, the operator is permitted a Completion Time of 72 hours to restore the inoperable block valve to OPERABLE status. The time allowed to restore the block valve is based upon the Completion Time for restoring an inoperable PORV in Condition B, since the PORVs may not be capable of mitigating an event if the inoperable block valve is not fully open. If the block valve is restored within the Completion Time of 72 hours, the power will be restored and the PORV restored to OPERABLE status. If it cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply, as required by Condition D. The Required Actions are modified by a Note stating that the Required Actions do not apply if the sole reason for the block valve being declared inoperable is as a result of power being removed to comply with other Required Actions. In this event, the Required Actions for inoperable PORV(s) (which require the block valve power to be removed once it is closed) are adequate to address the condition. While it may be desirable to also place the PORV(s) in manual control, this may not be possible for all causes of Condition B or E entry with PORV(s) inoperable and not capable of being manually cycled (e.g., as a result of failed control power fuse(s) or control switch malfunction(s)).

With a single block valve inoperable the other PORV and block valve pair are capable of manual operation to mitigate a SGTR event. Applying the RICT would only change the Completion Time of 72 hours if supported by risk analysis. It may not be in the public's best interest to shutdown a unit if there is reasonable assurance that a single PORV block valve can be returned to OPERABLE status within the limitations of the RICT.

Depending on plant equipment available the Steam Generator (SG) Atmospheric Relief Valves (ARV), the Steam Dumps, Steam Drains, Main Steam Safety Valves (MSSV), and Pressurizer Safety Valves all are capable of lowering Reactor Coolant System (RCS) pressure.

- 3.7.4.C Three or more required ARV lines inoperable.

From the CPNPP TS Bases;

The ARVs provide a method for cooling the unit to residual heat removal (RHR) entry conditions should the preferred heat sink via the Steam Dump System to the condenser not be available.

The ARVs may also be required to meet the design cooldown rate during a normal cooldown when steam pressure drops too low for maintenance of a vacuum in the condenser to permit use of the Steam Dump System.

The ARVs are OPERABLE with only a DC power source available, however, the automatic controls for the ARVs do not perform a safety function.

The design basis of the ARVs for the minimum relief capacity is established by the capability to cool the unit to RHR entry conditions and the capability to mitigate a SGTR, The design basis for the maximum relief capacity is established by the 10CFR100 limits for SGTR and the capacity of the MSSVs assumed in the accident analyses. The design rate of 50°F per hour is applicable for a natural circulation cooldown using two steam generators, each with one ARV. ***The unit can be cooled to RHR entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST.***

In the safety analysis, the ARVs are assumed to be used by the operator to cool down the unit to RHR entry conditions for events accompanied by a loss of offsite power. Prior to operator actions to cool down the unit, the main steam safety valves (MSSVs) are assumed to operate automatically to relieve steam and maintain the steam generator pressure below the design value. For the recovery from a steam generator tube rupture (SGTR) event, the operator is also required to perform a limited cooldown to establish adequate subcooling as a necessary step to terminate the primary to secondary break flow into the ruptured steam generator. The time required to terminate the primary to secondary break flow for an SGTR is more critical than the time required to cool down to RHR conditions for this event and also for other accidents. Thus, the SGTR is the limiting event for the ARVs. Four ARVs are required to be OPERABLE to satisfy the SGTR accident analysis requirements based on consideration of single failure assumptions regarding the failure of one or two ARVs to open on demand.

An ARV is considered OPERABLE when it is capable of providing controlled relief of the main steam flow and capable of fully opening and closing on demand using associated remote manual control.

With three or more ARV lines inoperable, action must be taken to restore at least two ARV line to OPERABLE status. This will result in at least two OPERABLE ARVs. Since the block valve can be closed to isolate an ARV, some repairs may be possible with the unit at power. The 24 hour Completion Time is reasonable to repair inoperable ARV lines, based on the availability of the Steam Dump System and MSSVs, and the low probability of an event occurring during this period that would require the ARV lines.

The RICT would only change the Completion Time based on risk analysis, not introduce a loss of safety function.

NRC ARII 6

TSTF-505, Revision 2, Table 1, "Conditions Requiring Additional Technical Justification: NUREG-1431, Westinghouse STS [Standard Technical Specifications]," requires additional justification for the following TS conditions listed below. The mark-up pages in TSTF-505, Revision 2 also indicate that additional technical justification is need for these TS conditions.

- *3.3.1.D One Power Range Neutron Flux – High channel inoperable.*
- *3.3.1.S One RTB [Reactor Trip Breaker] train inoperable.*
- *3.4.9.B One required group of pressurizer heaters inoperable.*
- *3.6.2.C One or more containment air locks inoperable for reasons other than Condition A or B.*
- *3.6.6.A One containment spray train inoperable.*
- *3.7.2.A One MSIV [Main Steam Isolation Valve] inoperable in MODE 1.*
- *3.7.4.B Two required ARV lines inoperable.*

The LAR does not contain such technical justification on changes to these conditions. Provide the additional justification for these conditions in accordance with TSTF-505, Revision 2.

CPNPP ARII 6 - Response

The information is now contained in Enclosure 1 and associated tables.

- 3.3.1.D One Power Range Neutron Flux – High channel inoperable.

The Reactor Trip System (RTS) instrumentation is segmented into four distinct but interconnected modules: field transmitters and process sensors, Signal Process Control and Protection System, Solid State Protection System (SSPS), and reactor trip switchgear. Field transmitters provide measurement of the unit parameters to the Signal Process Control and Protection System via separate, redundant channels. The Signal Process Control and Protection System forwards outputs to the SSPS, which consists of two redundant trains, to actuate a Reactor Trip or an Engineered Safety Feature (ESF). This redundancy maintains safety function.

Depending on the measured parameter, three or four instrumentation channels are provided to ensure protective action when required and to prevent inadvertent isolation resulting from instrumentation malfunctions. The output trip signal of each instrumentation channel initiates a trip logic. Failure of any one trip logic does not result in an inadvertent trip. Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient. In both cases, a

single failure will neither cause nor prevent the protective safety function actuation. With a failed power range instrument and rated thermal power greater than 75% the Quadrant Power Tilt Ratio must be verified 12 hours after the channel became inoperable and then every 12 hours until the channel is restored to OPERABLE status.

- 3.3.1.S One RTB [Reactor Trip Breaker] train inoperable.

A trip breaker train consists of all trip breakers associated with a single Reactor Trip System logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Consistent with the requirement in WCAP-15376-P-A to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when an RTB train is inoperable for maintenance are included. Multiple SSPS outputs provide trip signals to the trip logic which in turn opens the trip breakers. Additionally, CPNPP has ATWS Mitigation System Actuation Circuitry (AMSAC). At CPNPP the ATWS is referred to as the Anticipated Transient Without Trip (ATWT). AMSAC is independent of SSPS. AMSAC actuation will occur if turbine load is greater than 40% and three of four Steam Generator (SG) narrow range levels are less than 10%. There is a built in time delay to allow SSPS time to actuate. The AMSAC output will trip the main turbine, start all Auxiliary Feedwater (AFW) pumps, isolate SG blowdown and sample lines, and close the Condensate Storage Tank (CST) discharge valves. Due to a different main feedwater design on Unit 2, AMSAC also close the Feedwater Split-flow Bypass Valves (FSBVs). The system design is to provide AFW flow to the SGs and conserve feedwater while responding to an ATWT.

CPNPP adopted TSTF-411 with License Amendment 114 (ML050460331). It can be seen that the CPNPP SSPS which provides protection through actuation of required reactor trips and engineered safety features and the adoption the AMSAC system described above, there is defense-in-depth should the reactor not trip. AMSAC actuation is delayed allowing SSPS the opportunity to trip the reactor and actuate ESF components. If SSPS fails to perform its safety function, AMSAC will actuate to preserve a heat sink, preventing core damage.

A manual reactor trip from two different handswitches and a manual turbine trip in the Control Room are available, providing diversity and defense-in-depth.

CPNPP adds the following LCOs for completeness in Enclosure 1, Table E1-3, Conditions Requiring Additional Technical Justification;

- 3.3.5.B Two channels per bus for the Preferred offsite source bus undervoltage function inoperable
- 3.3.5.C Two channels per bus for the Alternate offsite source bus undervoltage function inoperable
- 3.3.5.D Two channels per bus for the 6.9 kV bus loss of voltage function inoperable

- 3.3.5.E Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable

Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses. For Conditions B, C, D, E, and F separate entries are allowed by TS 3.3.5. Currently each of these Conditions call for restoring one channel per bus to OPERABLE status within 1 hour. "Two channels per bus" is acceptable as each bus must have both channels to initiate the start signal for the DG in Conditions B, C, D, or E. Condition F allows for 1 hour to restore Automatic Actuation Logic and Actuation Relays train(s) whether one or both trains are inoperable. If one or both Automatic Actuation Logic and Actuation Relays train(s) are inoperable then the associated DG is declared inoperable after 1 hour. If both buses are found to be inoperable per Conditions B, C, D, or E then actions for the inoperable source or bus will be required. In applying the RICT, the 1 hour Completion Times may be extended based on plant configuration and acceptable risk. Failure to meet the Completion Time will cause entry into TS 3.8.1 for an inoperable Diesel Generator in accordance with TS 3.3.5, Condition G.

For each unit, the undervoltage protection system, leading to the start of the diesel generators (DG) on loss of offsite power (LOOP), consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

- 3.4.9.B One required group of pressurizer heaters inoperable.

Safety analyses do not take credit for pressurizer heaters. The initial assumption is that the RCS is at normal pressure. Any RICT application will evaluate the anticipated demand for more than one group of heaters. The current model of record does not explicitly model the pressurizer heater directly, instead, we use a surrogate to represent its function/impact in the RICT model. For the RICT, this is done by increasing the likelihood of a reactor trip by a factor of 10 (conservative modeling). The unavailability of one required group of pressurizer heaters would not have any significant impact on

plant transient response so there is no quantifiable impact to CDF or LERF. While mitigation of a SGTR is enhanced by the availability of pressurizer heaters, ECA-3.3A/B provides for mitigation of a SGTR without pressurizer heaters, if necessary.

Degraded pressurizer heater capability is supplemented by the availability of the remaining heaters for plant pressure control, and the availability of plant procedures which provide plant shutdown and cooldown guidance with pressurizer heaters. If the available heaters are sufficient to maintain RCS pressure control, normal plant operations can continue. CPNPP design includes one control heater group and three backup heater groups. Only two groups of heaters are required with an output of 150 KW each.

- 3.6.2.C One or more containment air locks inoperable for reasons other than Condition A or B.

TS 3.6.2 Condition C Action C.1 initiates action to evaluate the overall containment leakage rate per LCO 3.6.1. Actions also include verifying a door is closed in the affected air lock and restoring the air lock to OPERABLE status in 24 hours. If air lock is not restored, be in MODE 3 in 6 hours and MODE 5 in 36 hours.

- 3.6.6.A One containment spray train inoperable.

The Containment Spray (CT) System for each unit consists of two separate and completely redundant safety trains. Each Containment Spray train has two pumps. The CPNPP model of record / RICT model requires two CT spray pumps per train to meet its success criteria (only one train is required to meet the PRA success criteria). As this is explicitly modeled, when either pump (in a train) is removed from service the function is failed for that train and the RICT will be calculated based on the new configuration.

- 3.7.2.A One MSIV [Main Steam Isolation Valve] inoperable in MODE 1.

The design of the secondary system precludes the uncontrolled blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand.) This is accomplished by the closing of the other three MSIVs manually or automatically.

- 3.7.4.B Two required ARV lines inoperable.

The unit can be cooled to residual heat removal (RHR) entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST. Currently the Completion Time for one ARV inoperable is 7 days, for two ARVs inoperable is 72 hours, and for three or more ARVs inoperable is 24 hours.

The design basis of the ARVs for the minimum relief capacity is established by the capability to cool the unit to RHR entry conditions and the capability to mitigate a SGTR, The design basis for the maximum relief capacity is established by the 10CFR100 limits for SGTR and the capacity of the MSSVs assumed in the accident analyses. The design cooldown rate of 50°F per hour is applicable for a natural circulation cooldown

using two steam generators, each with one ARV. The unit can be cooled to RHR entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST.

NRC ARII 7

Condition 3.7.8.A, "Required SSW Pump on the opposite unit or its associated cross-connects inoperable," and the Required Actions A.1 and A.2 are plant-specific and per the TSTF-505, Revision 2 model application, a description of the variation and a justification of the applicability of TSTF-505 are required. LAR Attachment 1 treats Condition 3.7.8.A as an administrative difference, which is for differences in numbering or titles, which do not affect the applicability of TSTF-505. However, Condition 3.7.8.A is associated with the portion of the limiting condition for operation that is not covered by TSTF-505 and thus is a non-administrative plant-specific variation and a justification for the applicability of TSTF-505 is needed. Provide a description and justification of the applicability of TSTF-505 to Required Actions 3.7.8.A.1 and 3.7.8.A.2 in accordance with TSTF-505.

CPNPP ARII 7 - Response

From CPNPP TS Bases;

The SSWS consists of two separate, 100% capacity, safety related, cooling water trains. Each train consists of one 100% capacity pump, piping, valving, and instrumentation. The pumps and valves are remote and manually aligned to be operable in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to their respective loops are automatically started upon receipt of a safety injection signal. An automatic valve in the discharge of each pump is interlocked to open on a pump start. An automatic valve in the SSWS cooling water flow path for each emergency diesel generator automatically opens on a diesel generator start. All other valves are manual valves operated locally. The SSWS also is the backup water supply to the Auxiliary Feedwater System.

Cross-connections are provided between trains and between units such that any pump can supply any other pump's required flow.

Train isolation by two normally closed valves in series or one locked closed valve is provided to satisfy GDC-44. Unit isolation by one locked closed valve is provided to satisfy GDC-5.

In the event of a total Loss of Station Service Water (LOSSW) event in one unit at Comanche Peak, backup cooling capability is available via a cross-connect between the two units. An OPERABLE pump is manually realigned, and flow balanced to provide cooling to essential heat loads to one or both units as required. The OPERABILITY of the unit cross-connect along with a Station Service Water pump in the shutdown unit ensures the availability of sufficient redundant cooling capacity for the operating unit. The Limiting Condition of Operation will ensure a significant risk reduction as indicated

by the analyses of a Loss of Station Service Water System event. The surveillance requirements ensure the short and long-term OPERABILITY of the Station Service Water System and cross-connect between the two units.

The Station Service Water System cross-connect between the two units consists of appropriate piping and cross-connect valves connecting the discharge of the Station Service Water pumps of the two units. By aligning the cross-connect flow paths, additional redundant cooling capacity from one unit is available to the Station Service Water System of the other unit.

The principal safety related function of the SSWS is the removal of decay heat from the reactor via the CCW System. The design basis of the SSWS is for one SSWS train, in conjunction with the CCW System and a 100% capacity containment cooling system, to remove core decay heat following a design basis LOCA.

An SSW Pump on the opposite unit is OPERABLE as back-up in the event of a LOSSW if it is capable of providing required flow rates. An emergency diesel generator power source is not required because loss of offsite power is not assumed coincident with a LOSSW event.

A cross-connect valve is OPERABLE if it can be cycled or is locked open. A valve that cannot be demonstrated OPERABLE by cycling is considered inoperable until the valve is surveilled in the locked open position. However, at least one cross-connect valve between units is required to be maintained closed in accordance with GDC-5 unless required for flushing or due to total loss of Station Service Water pumps for either unit.

If no SSW pump on the opposite unit or its associated cross-connects are operable, the overall reliability is degraded since a back-up in the event of a Loss of Station Service Water System (LOSSWS) event may not be capable of performing the function. The 7 day completion time is based on the low probability of a LOSSWS during this time period.

CPNPP has consider the condition where a unit in MODEs 5, 6, and Defueled could have a single or no SSWP available. That would put the opposite unit, that is likely in MODE1 in a condition where they could have both trains of SSW OPERABLE but be in a forced unit shutdown based on the unavailability of an SSW pump on the opposite unit.

The RICT estimate for TS 3.7.8, Condition A is 30 days and Condition B is 12.2 days. In this situation Conditions A and B need to be considered in the aggregate to determine the appropriate Completion Times for the unit at power. Redundancy is maintained on the operating unit by the opposite train of SSW. It may not be in the public interest to shutdown a CPNPP unit based on the condition of SSW on the shutdown unit.

NRC Other Issues Identified During the Acceptance Review (OII) and CPNPP Response

The NRC staff also identified the following information requests that, although not required for the NRC to complete its acceptance review, the staff would provide the licensee if the staff ultimately accepts the application for review.

NRC OII 1

1. *These are editorial items identified in the proposed changes:*

NRC OII 1.a

a. *Proposed TS 1.3-8 in LAR Attachment 2 does not align with TSTF-505, Revision 2. Some of the defined terms and headings are not capitalized consistent with TSTF-505, Revision 2.*

CPNPP OII 1.a - Response

TS Example 1.3-8 in Attachment 2 is revised to match TSTF-505, Revision 2.

NRC OII 1.b

b. *Proposed TS 5.5.23, "Risk Informed Completion Time Program," differs from TSTF-505, Revision 3:*

   i. *missing title underscore,*

   ii. *paragraph c has an extra word in first sentence, and*

   iii. *paragraph e has different wording in third sentence.*

CPNPP OII 1.b - Response

Wording in Attachment 2 is revised to match TSTF-505-A, Revision 2 in accordance with WOG markup pages.

NRC OII 1.c

c. *TS 3.3.1: Several renumbered TS Conditions do not have their corresponding Required Actions renumbered in the markups in LAR Attachment 2 (Proposed TS 3.3.1 Conditions R, S, T, U, and V).*

CPNPP OII 1.c - Response

Conditions identified in Attachment 2 are revised as identified.

NRC OII 1.d

d. *Proposed Required Action 3.3.1.V.1 (identified as Required Action 3.3.1.U.1 in LAR Attachment 2) is inconsistent with the proposed changes in TSTF-505,*

Revision 2. TSTF-505, Revision 2 deletes "inoperable" while the proposed change does not.

CPNPP OII 1.d - Response

Required Action 3.3.1.V.1 in Attachment 2 is revised to delete "inoperable."

NRC OII 1.e

e. TS Required Action 3.6.2.C.1 appears to add text "LCO 3.6.1" ("LCO 3.6.1" is colored.) Proposed TS Required Action 3.6.2.C.1 is the same as in the current Comanche Peak TS.

CPNPP OII 1.e - Response

Attachment 2 Required Action 3.6.2.C.1 red text "LCO 3.6.1" is black to match ADAMS TS.

NRC OII 2

2. In the LAR, the licensee requested deletion of TS notes that have one-time change requirements but did not provide justification for these variations. This affects TS Required Actions 3.7.8.B.1, 3.7.8.B.2, 3.8.1.B.4.1, 3.8.1.B.4.2, and 3.8.4.B.2.

CPNPP OII 2 - Response

The justification for removal of the listed Required Actions is that they are no longer applicable. They are historical actions that have already been used. Removal deletes historical information that is no longer needed and is no longer valid. Not included in this list is 3.7.19.A.2 which is also deleted in Attachment 2.

NRC OII 3

3. LAR Attachment 1, Section 1.0, Paragraph 4, states in part:

   … only those Required Actions described in Attachment 4 and Enclosure 1, as reflected in the proposed TS mark-ups provided in Attachment 2, are proposed to be changed, because some of the modified Required Actions in TSTF-505 are not applicable to CPNPP, and there are some plant-specific Required Actions not included in TSTF-505 that are included in this proposed amendment.

However, there are proposed TS mark-ups in Attachment 2, which appear to be consistent with TSTF-505, that are not described in Attachment 4 and Enclosure 1. Clarify the inconsistency between the statement in LAR Attachment 1 and the changes indicated and LAR Attachments 2 and 4.

CPNPP OII 3 - Response

LAR Attachments 1, 2, 4 and Enclosure 1 have been synchronized to eliminate identified inconsistencies. Attachment 1 has been revised to state that the default conditions are consistent with TSTF-505, Revision 2. Attachment 2 includes the proposed TS changes including changes consistent with TSTF-505, Revision 2 and the removal of previously implemented one-time license amendments. Attachment 4 only lists cross-references to those TS changes proposed in Attachment 2. Enclosure 1 is revised to ensure consistency with Attachments 1, 2, and 4.

Revisions to Enclosure 1 include updating Tables E1-1, In Scope TS/LCO Conditions to Corresponding PRA Functions and E1-2, In Scope TS/LCO Conditions RICT Estimate. Additional tables are provided in Enclosure 1 to document additional justifications and evaluation of instrument and control system.

NRC OII 4

4. As part of its TSTF-505 review, the NRC staff examines each proposed TS condition for the potential LOF. One method to do that is reviewing the design success criteria (DSC) the licensee provided in the LAR. The DSC is a minimum set of remaining equipment required to perform the safety function. The DSC must demonstrate that the proposed change will not result in a LOF. The staff notes that the following DSC in Table E1-1 of the LAR do not reflect the criteria of DSC and therefore, raise the concern of the potential LOF.

   a. TS Condition 3.8.1.C is "Two required offsite circuits inoperable." The DSC in Table E1-1 for this TS condition is one offsite circuit. With both required offsite circuits inoperable, there is no required offsite circuit available to perform the safety function (providing alternating current (AC) power). However, according to the updated final safety analysis report (ADAMS Package Accession No. ML20315A055), the AC power system consists of the offsite circuits and the onsite AC power sources (i.e. emergency diesel generators). Therefore, with both offsite circuits inoperable, the onsite AC power sources can provide the AC power. Clarify or correct the DSC information in the Table.

   b. TS Condition 3.8.4.A is "One or two required battery chargers on one train inoperable." The DSC in Table E1-1 for this TS condition is "One 100% capacity battery for one of two DC trains." TS Condition 3.8.4.A is a TS condition related to battery charger inoperability, but the DSC in Table E1-1 describes the battery. Clarify or correct this DSC information in the Table.

CPNPP OII 4 - Response

Clarification added to Table E1-1 for above LCOs.

NRC OII 5

5. LAR Table E1-1 should be reviewed to determine if additional DSC need to be clarified comparable to the two examples in the previous question.

CPNPP OII 5 - Response

Table E1-1 has been reviewed and updated as necessary.

Replacement documents that support the supplemental submittal;

Please make the following changes to the original submittal made under Accession No. ML21131A233;

1. Replace Attachment 1 to TXX-21046 with Attachment 1 to TXX-21093.
2. Replace Attachment 2 to TXX-21046 with Attachment 2 to TXX-21093.
3. Replace Attachment 4 to TXX-21046 with Attachment 4 to TXX-21093.
4. Replace Enclosure 1 to TXX-21046 with Enclosure 1 to TXX-21093. Attached Tables E1-1 and E1-2 have been updated and Tables E1-3, E1-4, E1-5, E1-6, E1-7, and E1-8 have been added to address evaluation of instrument and control Functions and Function redundancy, independence, diversity, and defense-in-depth.
5. Replace Enclosure 7 to TXX-21046 with Enclosure 7 to TXX-21093.

ATTACHMENT 1
License Amendment Request

Comanche Peak Nuclear Power Plant, Units 1 and 2
NRC Docket Nos. 50-445 and 50-446

Revise Technical Specifications to Adopt Risk-Informed Completion Times TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b"

Description and Assessment of the Proposed Changes

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1.0 DESCRIPTION

In accordance with CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Vistra Operations Company LLC (Vistra OpCo) requests an amendment to Facility Operating License Nos. NPF-87 and NPF-89 for Comanche Peak Nuclear Power Plant, Units 1 and 2, (CPNPP).

The proposed amendment would modify the Technical Specification (TS) requirements related to Completion Times (CTs) for Required Actions to provide the option to calculate a longer, risk-informed CT (RICT). A new program, the Risk-Informed Completion Time (RICT) Program, is added to TS Section 5.0, "Administrative Controls."

The methodology for using the RICT Program is described in NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0, which was approved by the NRC on May 17, 2007. Adherence to NEI 06-09-A is required by the RICT Program.

The proposed amendment is consistent with TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b." However, only those Required Actions described in Attachment 4 and Enclosure 1, as reflected in the proposed TS mark-ups provided in Attachment 2, are proposed to be changed, because some of the modified Required Actions in TSTF-505 are not applicable to CPNPP, and there are some plant-specific Required Actions not included in TSTF-505 that are included in this proposed amendment.

The proposed amendment also removes the following three one-time only amendments;

1. License Amendment 170: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REVISION TO TECHNICAL SPECIFICATION 3.8.4, "DC SOURCES-OPERATING," CONDITION B (EXIGENT CIRCUMSTANCES) (EPID: L-2018-LLA-0238) (ML18267A384)
2. License Amendment 175: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 175 AND 175 REGARDING ONE-TIME REVISION TO TECHNICAL SPECIFICATION 3.7.19, "SAFETY CHILLED WATER" (EPID L-2020-LLA-0137) (ML20223A349)
3. License Amendment 178: COMANCHE PEAK NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 178 AND 178 REGARDING ONE-TIME REVISION TO TECHNICAL SPECIFICATIONS 3.7.8, "STATION SERVICE WATER SYSTEM (SSWS)," AND 3.8.1, "AC SOURCES – OPERATING" (EPID L-2020-LLA-0250) (ML21015A212)

The proposed amendment also establishes ***default*** Conditions in TS 3.3.1, Reactor Trip System (RTS) Instrumentation and TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation. While preparing this proposed amendment it became clear that establishing the ***default*** Conditions will bring the CPNPP Technical Specifications more in alignment with NUREG-1431, Standard Technical Specifications — Westinghouse Plants and the Technical Specification Writer's Guide.

The following ***default*** Conditions are proposed;

1. TS 3.3.1, Condition N: This Condition establishes the Required Action to ***Reduce THERMAL POWER to < P-7 with a 6 hour Completion Time*** when the Required Action and associated Completion Time of Condition M is not met.
2. TS 3.3.1, Condition Q: This Condition establishes the Required Action to ***Reduce THERMAL POWER to < P-9 with a 4 hour Completion Time*** when the Required Action and associated Completion Time of Condition O or P is not met.
3. TS 3.3.1, Condition W: This Condition establishes the Required Action to ***Be in MODE 3 with a 6 hour Completion Time*** when the Required Action and associated Completion Time of Condition B, D, E, R, S, T, or V is not met.
4. TS 3.3.1, Condition X: This Condition establishes the Required Action to ***Be in MODE 2 with a 6 hour Completion Time*** when the Required Action and associated Completion Time of Condition U is not met.
5. TS 3.3.2, Condition M: This Condition establishes the Required Action to ***Be in MODE 3 with a 6 hour Completion Time AND Be in MODE 5 with a 36 Completion Time*** when the Required Action and associated Completion Time of Condition B, C, or K is not met.
6. TS 3.3.2, Condition N: This Condition establishes the Required Action to ***Be in MODE 3 with a 6 hour Completion Time AND Be in MODE 4 with a 12 Completion Time*** when the Required Action and associated Completion Time of Condition D, E, F, G, or L is not met.
7. TS 3.3.2, Condition O: This Condition establishes the Required Action to ***Be in MODE 3 with a 6 hour Completion*** when the Required Action and associated Completion Time of Condition H, I, or J is not met.

The TS mark-ups in Attachment 2 include proposed changes due to implementation of TSTF-505, Revision 2, the removal of the one-time license amendments and the addition of the ***default*** Conditions in TS 3.3.1 and TS 3.3.2. These ***default*** conditions are consistent with TSTF-505, Revision 2.

The TS Bases mark-ups in Attachment 3 are provided "for information only." These proposed changes include changes due to implementation of TSTF-505, Revision 2, the removal of the one-time license amendments and the addition of the ***default*** Conditions in TS 3.3.1 and TS 3.3.2.

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

Vistra OpCo has reviewed TSTF-505, Revision 2 (ADAMS Accession No. ML18183A493), and the model safety evaluation dated November 21, 2018 (ADAMS Accession No. ML18267A259). This review included the information provided to support TSTF-505 and the safety evaluation for NEI 06-09-A (ADAMS Accession No. ML12286A322 (part of ADAMS Package Accession No. ML122860402)). As described in the subsequent paragraphs, Vistra OpCo has concluded that the technical basis is applicable to CPNPP and support incorporation of this amendment in the CPNPP TS.

2.2 Verifications and Regulatory Commitments

In accordance with Section 4.0, Limitations and Conditions, of the safety evaluation for NEI 06-09-A, the following is provided:

1. Enclosure 1 identifies each of the TS Required Actions to which the RICT Program will apply, with a comparison of the TS functions to the functions modeled in the probabilistic risk assessment (PRA) of the structures, systems and components (SSCs) subject to those actions.

2. Enclosure 2 provides a discussion of the results of peer reviews and self-assessments conducted for the plant-specific PRA models which support the RICT Program, as required by Regulatory Guide (RG) 1.200, Section 4.2.

3. Enclosure 3 is not applicable since each PRA model used for the RICT Program is addressed using a standard endorsed by the Nuclear Regulatory Commission.

4. Enclosure 4 provides appropriate justification for excluding sources of risk not addressed by the PRA models.

5. Enclosure 5 provides the plant-specific baseline core damage frequency (CDF) and large early release frequency (LERF) to confirm that the potential risk increases allowed under the RICT Program are acceptable.

6. Enclosure 6 is not applicable since the RICT Program is not being applied to shutdown models.

7. Enclosure 7 provides a discussion of the licensee's programs and procedures that assure the PRA models that support the RICT Program are maintained consistent with the as-built, as-operated plant.

8. Enclosure 8 provides a description of how the baseline PRA model, which calculates average annual risk, is evaluated and modified to assess real time configuration risk, and describes the scope of, and quality controls applied to the real-time model.

9. Enclosure 9 provides a discussion of how the key assumptions and sources of uncertainty in the PRA models were identified, and how their impact on the RICT Program was assessed and dispositioned.

10. Enclosure 10 provides a description of the implementing programs and procedures regarding the plant staff responsibilities for the RICT Program implementation, including risk management action (RMA) implementation.

11. Enclosure 11 provides a description of the monitoring program as described in NEI 06-09-A, Section 2.3.2, Step 7.

12. Enclosure 12 provides a description of the process to identify and provide RMAs, including examples.

2.3 Optional Changes and Variations

Vistra OpCo is proposing the following variations from the TS changes described in TSTF-505, Revision 2, or the applicable parts of the NRC's model safety evaluation dated November 21, 2018. These options were recognized as acceptable variations in TSTF-505 and the NRC's model safety evaluation.

Note that, in several instances, the CPNPP TS use different numbering and titles than the Standard Technical Specifications (STS) on which TSTF-505 was based. These differences are administrative and do not affect the applicability of TSTF-505 to the CPNPP TS. Only TS changes consistent with the CPNPP design and TS are included. Attachment 4 provides specific information.

Attachment 4 is a cross-reference that provides a comparison between the NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Required Actions included in TSTF-505 and the CPNPP Actions included in this license amendment request. The attachment includes a summary description of the referenced Required Actions, which is provided for information purposes only and is not intended to be a verbatim description of the Required Actions. The cross-reference in Attachment 4 identifies the following:

1. CPNPP Actions that have identical numbers to the corresponding NUREG-1431 Required Actions are not deviations from TSTF-505, except for administrative deviations (if any) such as formatting. These deviations are administrative with no impact on the NRC's model safety evaluation dated November 21, 2018.

2. CPNPP Actions that have different numbering than the NUREG-1431 Required Actions are an administrative deviation from TSTF-505 with no impact on the NRC's model safety evaluation dated November 21, 2018.

3. For NUREG-1431 Required Actions that are not contained in the CPNPP TS, the corresponding TSTF-505 mark-ups for the Required Actions are not applicable to CPNPP. This is an administrative deviation from TSTF-505 with no impact on the NRC's model safety evaluation dated November 21, 2018.

4. Existing CPNPP Actions that have new numbers because of additional Actions added to the TS consistent with TSTF-505 are administrative deviations from TSTF-505 with no impact on the NRC's model safety evaluation dated November 21, 2018.

5. The model application provided in TSTF-505, Revision 2, includes an attachment for typed, camera-ready (revised) TS pages reflecting the proposed changes. CPNPP is not including such an attachment due to the number of TS pages included in this submittal that have the potential to be affected by other unrelated license amendment requests and the straightforward nature of the proposed changes. Providing only mark-ups of the proposed TS changes satisfies the requirements of 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," in that the mark-ups fully describe the changes desired. This is an administrative

deviation from TSTF-505 with no impact on the NRC's model safety evaluation dated November 21, 2018. Because of this deviation, the contents and numbering of the attachments for this amendment request differ from the attachments specified in the model application in TSTF-505, Revision 2.

6. As stated in TSTF-505, Revision 2, it is necessary to adopt TSTF-439, "Eliminate Second Completion Times Limiting Time from Discovery of Failure to Meet an LCO," in order to adopt TSTF-505 for those Required Actions that are affected by both travelers. On December 19, 2006, (ADAMS Accession No. ML070580149) Vistra OpCo submitted a license amendment request (LAR) for CPNPP to adopt TSTF-439. This LAR impacts the following TS.

    - TS 3.7.5, Auxiliary Feedwater System
    - TS 3.8.1, AC Sources-Operating
    - TS 3.8.9, Distribution Systems-Operating

There are several plant-specific LCOs and associated Actions for which CPNPP are proposing to apply the RICT Program that are variations from TSTF-505 as identified in Attachment 4 with additional justification provided below:

- 3.3.5.B.1 – Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.

  The requirements of TS 3.3.5, Action B.1 currently allow for 1 hour to restore one channel per bus to OPERABLE status. This will result in at least one operable sensing relay per bus. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring a loss of power (LOP) start occurring during this interval.

  Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

  For each unit, the undervoltage protection system, leading to the start of the diesel generators (DG) on loss of offsite power (LOOP), consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOOP DG start instrumentation, in conjunction with the ESF systems powered

from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

Application of a RICT for this Action will not adversely affect the ability of the LOOP DG start instrumentation or the Engineered Safety Features Systems to perform their intended safety function.

- 3.3.5.C.1 – Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.

  The requirements of TS 3.3.5, Action C.1 currently allow for 1 hour to restore one channel per bus to OPERABLE status. This will result in at least one operable sensing relay per bus. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP start occurring during this interval.

  Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

  For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of offsite power, consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

  Application of a RICT for this Action will not adversely affect the ability of the LOOP DG start instrumentation or the Engineered Safety Features Systems to perform their intended safety function.

- 3.3.5.D.1 – Two channels per bus for the 6.9 kV buss loss of voltage function inoperable.

  The requirements of TS 3.3.5, Action D.1 currently allow for 1 hour to restore one channel per bus to OPERABLE status. This will result in at least one operable sensing relay per bus. The 1 hour Completion Time should allow ample time to

repair most failures and considers the low probability of an event requiring an LOP start occurring during this interval.

Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of offsite power, consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

Application of a RICT for this Action will not adversely affect the ability of the LOOP DG start instrumentation or the Engineered Safety Features Systems to perform their intended safety function.

- 3.3.5.E.1 – Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable.

  The requirements of TS 3.3.5, Action E.1 currently allow for 1 hour to restore one channel per bus to OPERABLE status. This will result in at least one operable sensing relay per bus. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP start occurring during this interval.

  Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

  For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of offsite power, consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage,

6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

Application of a RICT for this Action will not adversely affect the ability of the LOOP DG start instrumentation or the Engineered Safety Features Systems to perform their intended safety function.

- 3.3.5.F.1 – One or more Automatic Actuation Logic and Actuation Relays trains inoperable.

  The requirements of TS 3.3.5, Action F.1 currently allow for 1 hour to restore one train to OPERABLE status. This will result in at least one operable Automatic Logic and Actuation Relays train operable. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP start occurring during this interval.

  Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

  For each unit, the undervoltage protection system, leading to the start of the diesel generators (DG) on loss of offsite power (LOOP), consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

Application of a RICT for this Action will not adversely affect the ability of the LOOP DG start instrumentation or the Engineered Safety Features Systems to perform their intended safety function.

- 3.5.2.A.1 – One train inoperable because of the inoperability of a centrifugal charging pump.

  The requirements of TS 3.5.2, Action A.1 currently allow for 7 days to restore the centrifugal charging pump to operable status. With one centrifugal charging pump inoperable the Emergency Core Cooling System (ECCS) is still capable of providing 100% capacity. The 7 day completion time is based on a risk-informed assessment to manage the risk associated with the equipment in accordance with the Configuration Risk Management Program and is responsible for the repair of a centrifugal charging pump.

  The ECCS consists of three separate subsystems: centrifugal charging (high head), safety injection (intermediate head), and residual heat removal (low head). 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 accident consequences. The interconnecting and redundant subsystem design provides the operators with the ability to utilize components from opposite trains to achieve the required 100% flow.

  Application of a RICT for this Action will not adversely affect the ability of the ECCS to perform their intended safety function.

- 3.7.4.C.1 – Steam Generator Atmospheric Relief Valves (ARVs); Three or more required ARV lines inoperable.

  The requirements of TS 3.7.4, Action C.1 currently allow 24 hours to restore at least two ARV lines to OPERABLE status. This will result in at least two OPERABLE ARVs. Since the block valve can be closed to isolate an ARV, some repairs may be possible with the unit at power. The 24-hour Completion Time is reasonable to repair inoperable ARV lines, based on the availability of the Steam Dump System and Main Steam Safety Valves (MSSVs), and the low probability of an event occurring during this period that would require the ARV lines.

  The ARVs provide a method for cooling the unit to residual heat removal (RHR) entry conditions should the preferred heat sink via the Steam Dump System to the condenser not be available. This is done in conjunction with the Auxiliary Feedwater System providing cooling water from the condensate storage tank (CST).

  The design basis of the ARVs for the minimum relief capacity is established by the capability to cool the unit to RHR entry conditions and the capability to mitigate a steam generator tube rupture (SGTR). The design basis for the maximum relief capacity is established by the 10 CFR 100 limits for SGTR and the capacity of the MSSVs assumed in the accident analyses. The design rate of 50°F per hour is

applicable for a natural circulation cooldown using two steam generators, each with one ARV. The unit can be cooled to RHR entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST.

Application of a RICT for this Action will not adversely affect the ability of the Steam Generator ARVs to perform their intended safety function.

- 3.7.8.B.1 – Station Service Water System, One SSWS train inoperable

The requirements of TS 3.7.8, Action B.1 currently allow 72 hours to restore the SSWS train to operable status. In this condition, the remaining OPERABLE SSWS is adequate to provide a heat sink for the removal of process and operating heat from safety related components.

The SSWS consists of two separate, 100% capacity, safety related, cooling water trains. Each train consists of one 100% capacity pump, piping, valving, and instrumentation. The pumps and valves are remote and manually aligned to be operable in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to their respective loops are automatically started upon receipt of a safety injection signal. An automatic valve in the discharge of each pump is interlocked to open on a pump start. An automatic valve in the SSWS cooling water flow path for each emergency diesel generator automatically opens on a diesel generator start. All other valves are manual valves operated locally. The SSWS also is the backup water supply to the Auxiliary Feedwater System.

In the event of a total Loss of Station Service Water (LOSSW) event in one unit at Comanche Peak, backup cooling capability is available via a cross-connect between the two units. An OPERABLE pump is manually realigned, and flow balanced to provide cooling to essential heat loads to one or both units as required. The OPERABILITY of the unit cross-connect along with a Station Service Water pump in the shutdown unit ensures the availability of sufficient redundant cooling capacity for the operating unit. The Limiting Condition of Operation will ensure a significant risk reduction as indicated by the analyses of a Loss of Station Service Water System event. The surveillance requirements ensure the short and long-term OPERABILITY of the Station Service Water System and cross-connect between the two units.

The Station Service Water System cross-connect between the two units consists of appropriate piping and cross-connect valves connecting the discharge of the Station Service Water pumps of the two units. By aligning the cross-connect flow paths, additional redundant cooling capacity from one unit is available to the Station Service Water System of the other unit.

The principal safety related function of the SSWS is the removal of decay heat from the reactor via the CCW System. The design basis of the SSWS is for one SSWS train, in conjunction with the CCW System and a 100% capacity

containment cooling system, to remove core decay heat following a design basis LOCA.

An SSW Pump on the opposite unit is OPERABLE as back-up in the event of a LOSSW if it is capable of providing required flow rates. An emergency diesel generator power source is not required because loss of offsite power is not assumed coincident with a LOSSW event.

A cross-connect valve is OPERABLE if it can be cycled or is locked open. A valve that cannot be demonstrated OPERABLE by cycling is considered inoperable until the valve is surveilled in the locked open position. However, at least one cross-connect valve between units is required to be maintained closed in accordance with GDC-5 unless required for flushing or due to total loss of Station Service Water pumps for either unit.

If no SSW pump on the opposite unit or its associated cross-connects are operable, the overall reliability is degraded since a back-up in the event of a Loss of Station Service Water System (LOSSWS) event may not be capable of performing the function. The 7 day completion time is based on the low probability of a LOSSWS during this time period.

Application of a RICT for this Action will not adversely affect the ability of the Station Service Water System to perform its safety function.

- 3.7.19.A.1 – Safety Chilled Water; One safety chilled water train inoperable

The requirements of TS 3.7.19, Action A.1 currently allow 72 hours to restore the safety chilled water train to OPERABLE status. In this condition, the remaining OPERABLE Safety Chilled Water System train is adequate to perform the heat removal function for its associated essential equipment.

However, the overall reliability is reduced because a single failure in the OPERABLE Safety Chilled Water System train could result in loss of the Safety Chilled Water System function. The 72-hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time.

The design basis of the Safety Chilled Water System is to support emergency fan coil units (EFCUs) that maintain air temperatures as required in selected rooms containing safety-related equipment during normal operation and during and after a design basis accident (with or without a loss of offsite power) or a blackout (loss of offsite power, LOOP). The system is designed to provide chilled water to maintain the ambient air temperature within the design limits of the essential equipment served by the system.

The Safety Chilled Water System for each unit consists of two separate and completely redundant safety trains. Each train consists of one packaged centrifugal chiller, one centrifugal chilled water recirculation pump, interconnecting piping, valves, controls, and instrumentation. There are no automatic valves in the system.

Additionally, the two trains share a common chilled water surge (expansion) tank, partitioned in the middle into two separate compartments to provide complete separation of the two trains, that function to ensure sufficient net positive suction head is available.

Application of a RICT for this Action will not adversely affect the ability of the Safety Chilled Water to perform its intended safety function.

Vistra OpCo has determined that the application of a RICT for these CPNPP plant specific LCOs is consistent with TSTF-505, Revision 2, and with the NRC's model safety evaluation dated November 21, 2018. Application of a RICT for these plant specific LCOs will be controlled under the RICT Program. The RICT Program provides the necessary administrative controls to permit extension of Completion Times and thereby delay reactor shutdown or remedial actions if risk is assessed and managed within specified limits and programmatic requirements. The specified safety function or performance levels of TS required structures, systems or components (SSCs) are unchanged, and the remedial actions, including the requirement to shut down the reactor, are also unchanged; only the Action completion times are extended by the RICT Program.

Application of a RICT is evaluated using the methodology and probabilistic risk guidelines contained in NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0, which was approved by the NRC on May 17, 2007 (ADAMS Accession No. ML071200238). The NEI 06-09-A, Revision 0 methodology includes a requirement to perform a quantitative assessment of the potential impact of the application of a RICT on risk, to reassess risk due to plant configuration changes, and to implement compensatory measures and risk management actions (RMAs) to maintain the risk below acceptable regulatory risk thresholds. In addition, the NEI 06-09-A, Revision 0 methodology satisfies the five key safety principles specified in Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications," dated August 1998 (ADAMS Accession No. ML003740176), relative to the risk impact due to the application of a RICT.

Therefore, the proposed application of a RICT in the CPNPP plant specific Actions is consistent with TSTF-505, Revision 2, and with the NRC's model safety evaluation dated November 21, 2018.

Vistra OpCo has reviewed these changes and determined that they do not affect the applicability of TSTF-505, Revision 2, to the CPNPP TS.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Determination

Vistra OpCo has evaluated the proposed changes to the TS using the criteria in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazards consideration.

Comanche Peak Nuclear Power Plant, Units 1 and 2, request adoption of an approved change to the standard technical specifications (STS) and plant-specific technical

specifications (TS), to modify the TS requirements related to Completion Times for Required Actions to provide the option to calculate a longer, risk-informed Completion Time. The allowance is described in a new program in Section 5.0, "Administrative Controls," entitled the "Risk-Informed Completion Time Program."

As required by 10 CFR 50.91(a), an analysis of the issue of no significant hazards consideration is presented below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes permit the extension of Completion Times provided the associated risk is assessed and managed in accordance with the NRC approved Risk-Informed Completion Time Program, removes historical information, and establishes default Conditions in TS 3.3.1 and TS 3.3.2. The proposed changes do not involve a significant increase in the probability of an accident previously evaluated because the changes involve no change to the plant or its modes of operation. The proposed changes do not increase the consequences of an accident because the design-basis mitigation function of the affected systems is not changed and the consequences of an accident during the extended Completion Time are no different from those during the existing Completion Time.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes do not change the design, configuration, or method of operation of the plant. The proposed changes do not involve a physical alteration of the plant (no new or different kind of equipment will be installed).

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No.

The proposed change permits the extension of Completion Times provided risk is assessed and managed in accordance with the NRC approved Risk-Informed Completion Time Program, removes historical information, and establishes default Conditions in TS 3.3.1 and TS 3.3.2. The proposed change implements a risk-informed configuration management program to assure that adequate margins of safety are maintained. Application of these new specifications and the configuration management program considers cumulative effects of multiple systems or components being out of service and does so more effectively than the current TS.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Vistra OpCo, concludes that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

3.2 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

4.0 ENVIRONMENTAL CONSIDERATION

Vistra OpCo has reviewed the environmental evaluation included in the model safety evaluation published on November 21, 2018 as part of the Notice of Availability. Vistra OpCo has concluded that the NRC staff findings presented in that evaluation are applicable to CPNPP Units 1 and 2, NPF-87 and NPF-89.

The proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed changes.

5.0 REFERENCES

1. Topical Report NEI 06-09, Revision 0-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines" (ADAMS Accession No. ML12286A322 (part of ADAMS Package Accession No. ML122860402)).
2. NUREG-0800, Standard Review Plan 19.1, "Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 3, May 2012.
3. NUREG-0800, Standard Review Plan 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," Revision 0, November 2002.
4. NUREG-0800, Standard Review Plan 16.1, "Risk-Informed Decisionmaking: Technical Specifications," Revision 1, March 2007.
5. Regulatory Guide 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," May 2011, Accession No. ML10091006.
6. Regulatory Guide 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," May 2011, Accession No. ML100910008.

7. Regulatory Guide 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," March 2009, Accession No. ML090410014.

Attachment 2

License Amendment Request

Comanche Peak Nuclear Power Plant, Units 1 and 2
NRC Docket Nos. 50-445 and 50-446

Revise Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b"

Proposed Technical Specification pages (markup)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-6 (continued)

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

EXAMPLE 1.3-7

ACTIONS

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

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

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

EXAMPLE 1.3-8 INSERT

IMMEDIATE COMPLETION TIME

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

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

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

APPLICABILITY: According to Table 3.3.1-1

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours
	~~OR~~	RICT INSERT
	~~B.2 Be in MODE 3.~~	~~54 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One Power Range Neutron Flux - High channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment. ----------	
	D.1.1 ----------NOTE---------- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. ---------- Perform SR 3.2.4.2.	12 hours from discovery of THERMAL POWER > 75% RTP AND Once per 12 hours thereafter
	AND	
	D.1.2 Place channel in trip.	72 hours
	~~OR~~	RICT INSERT
	~~D.2 Be in MODE 3~~	~~78 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ---------- E.1 Place channel in trip. ~~OR~~ ~~E.2 Be in MODE 3.~~	 72 hours RICT INSERT ~~78 hours~~
F. One Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6. OR F.2 Increase THERMAL POWER to > P-10.	24 hours 24 hours
G. Two Intermediate Range Neutron Flux channels inoperable.	G.1 ----------NOTE---------- Limited boron concentration changes associated with RCS inventory control or limited plant temperature changes are allowed. ---------- Suspend operations involving positive reactivity additions. AND G.2 Reduce THERMAL POWER to < P-6.	 Immediately 2 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. One channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ---------- M.1 Place channel in trip. ~~OR~~ ~~M.2 Reduce THERMAL POWER to < P-7.~~	72 hours RICT INSERT ~~78 hours~~
N. ~~Not used.~~ INSERT TS 3.3.1 Condition N		
O. One Low Fluid Oil pressure Turbine Trip channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ---------- O.1 Place channel in trip. ~~OR~~ ~~O.2 Reduce THERMAL POWER to < P-9.~~	72 hours RICT INSERT ~~76 hours~~
P. One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable. INSERT TS 3.3.1 Condition Q	P.1 Place channel(s) in trip. ~~OR~~ ~~P.2 Reduce THERMAL POWER to < P-9.~~	72 hours RICT INSERT ~~76 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~Q.~~ R One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	R.1 ~~Q.1~~ Restore train to OPERABLE status.	24 hours
	~~OR~~	RICT INSERT
	~~Q.2 Be in MODE 3.~~	~~30 hours~~
~~R.~~ S One RTB train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing or maintenance, provided the other train is OPERABLE. ----------	
	S.1 ~~R.1~~ Restore train to OPERABLE status.	24 hours
	~~OR~~	RICT INSERT
	~~R.2 Be in MODE 3.~~	~~30 hours~~
~~S.~~ T One or more required channel(s) inoperable.	T.1 ~~S.1~~ Verify interlock is in required state for existing unit conditions.	1 hour
	~~OR~~	
	~~S.2 Be in MODE 3.~~	~~7 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~T.~~ U One or more required channel(s) inoperable.	~~T.1~~ U.1 Verify interlock is in required state for existing unit conditions. ~~OR~~ ~~T.2 Be in MODE 2.~~	1 hour ~~7 hours~~
~~U.~~ V One trip mechanism inoperable for one RTB.	~~U.1~~ V.1 Restore ~~inoperable~~ trip mechanism to OPERABLE status. ~~OR~~ ~~U.2 Be in MODE 3.~~	48 hours RICT INSERT ~~54 hours~~
~~V.~~ W Not used. INSERT TS 3.3.1 Condition W		
X INSERT TS 3.3.1 Condition X		

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.1-1 (page 4 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
16. Turbine Trip					
a. Low Fluid Oil Pressure	1[j]	3	O	SR 3.3.1.10 SR 3.3.1.15	≥ 46.6 psig
b. Turbine Stop Valve Closure	1[j]	4	P	SR 3.3.1.10 SR 3.3.1.15	≥ 1% open
17. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	R → ~~Q~~	SR 3.3.1.14	NA
18. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2[e]	2	T → ~~S~~	SR 3.3.1.11 SR 3.3.1.13	≥ 6E-11 amp
b. Low Power Reactor Trips Block, P-7	1	1 per train	U → ~~T~~	SR 3.3.1.5	NA
c. Power Range Neutron Flux, P-8	1	4	U → ~~T~~	SR 3.3.1.11 SR 3.3.1.13	≤ 50.7% RTP
d. Power Range Neutron Flux, P-9	1	4	U → ~~T~~	SR 3.3.1.11 SR 3.3.1.13	≤ 52.7% RTP
e. Power Range Neutron Flux, P-10	1,2	4	T → ~~S~~	SR 3.3.1.11 SR 3.3.1.13	≥ 7.3% RTP and ≤ 12.7% RTP
f. Turbine First Stage Pressure, P-13	1	2	U → ~~T~~	SR 3.3.1.10 SR 3.3.1.13	≤ 12.7% turbine power
19. Reactor Trip Breakers(RTBs)[k]	1,2	2 trains	S → ~~R~~	SR 3.3.1.4	NA
	3[b], 4[b], 5[b]	2 trains	C	SR 3.3.1.4	NA

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Contol System capable of rod withdrawal or one or more rods not fully inserted.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(j) Above the P-9 (Power Range Neutron Flux) interlock.
(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

Table 3.3.1-1 (page 5 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
20. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms[k]	1,2	1 each per RTB	V → ~~U~~	SR 3.3.1.4	NA
	3[b], 4[b], 5[b]	1 each per RTB	C	SR 3.3.1.4	NA
21. Automatic Trip Logic	1,2	2 trains	R → ~~Q~~	SR 3.3.1.5	NA
	3[b], 4[b], 5[b]	2 trains	C	SR 3.3.1.5	NA

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Contol System capable of rod withdrawal or one or more rods not fully inserted.
(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

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

APPLICABILITY: According to Table 3.3.2-1

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	~~OR~~	RICT INSERT
	~~B.2.1 Be in MODE 3.~~	~~54 hours~~
	~~AND~~	
	~~B.2.2 Be in MODE 5.~~	~~84 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	C.1 Restore train to OPERABLE status.	24 hours
	~~OR~~	← RICT INSERT
	~~C.2.1 Be in MODE 3.~~	~~30 hours~~
	~~AND~~	
	~~C.2.2 Be in MODE 5.~~	~~60 hours~~
D. One channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	D.1 Place channel in trip.	72 hours
	~~OR~~	← RICT INSERT
	~~D.2.1 Be in MODE 3.~~	~~78 hours~~
	~~AND~~	
	~~D.2.2 Be in MODE 4.~~	~~84 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Containment Pressure channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	E.1 Place channel in bypass.	72 hours
	~~OR~~	
	~~E.2.1 Be in MODE 3.~~	~~78 hours~~
	~~AND~~	
	~~E.2.2 Be in MODE 4.~~	~~84 hours~~
F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status.	48 hours
	~~OR~~	RICT INSERT
	~~F.2.1 Be in MODE 3.~~	~~54 hours~~
	~~AND~~	
	~~F.2.2 Be in MODE 4.~~	~~60 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	G.1 Restore train to OPERABLE status.	24 hours
	~~OR~~	RICT INSERT
	~~G.2.1 Be in MODE 3.~~	~~30 hours~~
	~~AND~~	
	~~G.2.2 Be in MODE 4.~~	~~36 hours~~
H. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ----------	
	H.1 Restore train to OPERABLE status.	24 hours
	~~OR~~	RICT INSERT
	~~H.2 Be in MODE 3.~~	~~30 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	I.1 Place channel in trip.	72 hours
	~~OR~~	RICT INSERT
	~~I.2 Be in MODE 3.~~	~~78 hours~~
J. One Main Feedwater Pump trip channel inoperable.	J.1 Place channel in trip.	6 hours
	~~OR~~	RICT INSERT
	~~J.2 Be in MODE 3.~~	~~12 hours~~
K. One channel inoperable.	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	K.1 Place channel in bypass.	72 hours
	~~OR~~	
	~~K.2.1 Be in MODE 3.~~	~~78 hours~~
	~~AND~~	
	~~K.2.2 Be in MODE 5.~~	~~108 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. One or more ~~required~~ channel~~(s)~~ inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	~~OR~~	
	~~L.2.1 Be in MODE 3.~~	~~7 hours~~
	~~AND~~	
	~~L.2.2 Be in MODE 4.~~	~~13 hours~~

INSERT TS 3.3.2 Conditions M, N, and O

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.3	Not Used.	

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 The Loss of Power Diesel Generator Start Instrumentation for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

----------NOTE----------
Not applicable for 6.9 kV Preferred Offsite Source Undervoltage function when associated source breaker is open.

ACTIONS

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

----------NOTE----------
RICT entry is not permitted for more than one Condition at a time for Conditions B, C, D or E.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Not applicable to Automatic Actuation Logic and Actuation Relays Function ----------		
One or more Functions with one channel per bus inoperable.	A.1 Place channel in trip.	6 hours ← RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	B.1 Restore one channel per bus to OPERABLE status.	1 hour RICT INSERT
	OR	
	B.2.1 Declare the Preferred offsite source inoperable.	1 hour
	AND	
	B.2.2 Open associated Preferred offsite source bus breaker.	6 hours
C. Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	C.1 Restore one channel per bus to OPERABLE status.	1 hour RICT INSERT
	OR	
	C.2.1 Declare the Alternate offsite source inoperable.	1 hour
	AND	
	C.2.2 Open associated Alternate offsite source bus breaker.	6 hours
D. Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	D.1 Restore one channel per bus to OPERABLE status.	1 hour RICT INSERT
	OR	
	D.2 Declare the affected A.C. emergency buses inoperable.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1 Restore one channel per bus to OPERABLE status.	1 hour RICT INSERT
	OR	
	E.2.1 Declare both offsite power source buses inoperable.	1 hour
	AND	
	E.2.2 Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1 Restore train(s) to OPERABLE status.	1 hour RICT INSERT
G. Required Action and associated Completion Time not met.	G.1 Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

a. Pressurizer water level ≤ 92%; and

b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 150 kW.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Be in MODE 3.	6 hours
	AND	
	A.2 Fully insert all rods.	6 hours
	AND	
	A.3 Place Rod Control System in a condition incapable of rod withdrawal.	6 hours
	AND	
	A.4 Be in MODE 4.	12 hours
B. One required group of pressurizer heaters inoperable.	B.1 Restore required group of pressurizer heaters to OPERABLE status.	72 hours ← RICT INSERT

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valves (PORVs)

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

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORVs inoperable and capable of being manually cycled.	A.1 Close and maintain power to associated block valve.	1 hour
B. One PORV inoperable and not capable of being manually cycled.	B.1 Close associated block valve. AND B.2 Remove power from associated block valve. AND B.3 Restore PORV to OPERABLE status.	1 hour 1 hour 72 hours RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One block valve inoperable.	----------NOTE---------- Required Actions do not apply when block valve is inoperable solely as a result of complying with Required Actions B.2 or E.2. ----------	
	C.1 Place associated PORV in manual control.	1 hour
	AND	
	C.2 Restore block valve to OPERABLE status.	72 hours RICT INSERT
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 4	12 hours
E. Two PORVs inoperable and not capable of being manually cycled.	E.1 Close associated block valves.	1 hour
	AND	
	E.2 Remove power from associated block valves.	1 hour
	AND	
	E.3 Be in MODE 3	6 hours
	AND	
	E.4 Be in MODE 4	12 hours

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS -- Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

----------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. Operation in MODE 3 with ECCS pumps made incapable of injecting, pursuant to LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," is allowed for up to 4 hours or until the temperature of all RCS cold legs exceeds 375°F, whichever comes first.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable because of the inoperability of a centrifugal charging pump.	A.1 Restore pump to OPERABLE status.	7 days RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1 Restore train(s) to OPERABLE status.	72 hours RICT INSERT
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed. Number / Position / Function 8802 A&B / Closed / SI Pump to Hot Legs 8809 A&B / Open / RHR to Cold Legs 8835 / Open / SI Pump to Cold Legs 8840 / Closed / RHR to Hot Legs 8806 / Open / SI Pump Suction from RWST 8813 / Open / SI Pump Miniflow Valve	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more containment air locks inoperable for reasons other than Condition A or B.	C.1 Initiate action to evaluate overall containment leakage rate per LCO 3.6.1.	Immediately
	AND	
	C.2 Verify a door is closed in the affected air lock.	1 hour
	AND	
	C.3 Restore air lock to OPERABLE status.	24 hours RICT INSERT
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 5.	36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Only applicable to penetration flow paths with two containment isolation valves. ----------	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	4 hours RICT INSERT
One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.	AND	
	A.2 ----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed or otherwise secured may be verified by administrative means. ----------	
	Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside containment following isolation
		AND
		Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ----------NOTE---------- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. ----------	C.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	72 hours RICT INSERT
	AND	
One or more penetration flow paths with one containment isolation valve inoperable.	C.2 ----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed or otherwise secured may be verified by administrative means. ----------	
	Verify the affected penetration flow path is isolated.	Once per 31 days following isolation
D. One or more penetration flow paths with one or more containment purge, hydrogen purge or containment pressure relief valves not within leakage limits.	D.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND	24 hours

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours RICT INSERT
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours
C. Two containment spray trains inoperable.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

LCO 3.7.2 Four MSIVs shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 except when all MSIVs are closed and deactivated.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV inoperable in MODE 1.	A.1 Restore MSIV to OPERABLE status.	8 hours RICT INSERT
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours
C. ----------NOTE---------- Separate Condition entry is allowed for each MSIV. ---------- One or more MSIV inoperable in MODE 2 or 3.	C.1 Close MSIV. AND C.2 Verify MSIV is closed.	8 hours Once per 7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours

3.7 PLANT SYSTEMS

3.7.4 Steam Generator Atmospheric Relief Valves (ARVs)

LCO 3.7.4 Four ARV lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ARV line inoperable.	A.1 Restore required ARV line to OPERABLE status.	7 days RICT INSERT
B. Two required ARV lines inoperable.	B.1 Restore at least one ARV line to OPERABLE status.	72 hours RICT INSERT
C. Three or more required ARV lines inoperable.	C.1 Restore at least two ARV lines to OPERABLE status.	24 hours RICT INSERT
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4	6 hours 12 hours

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable.	A.1 Restore steam supply to OPERABLE status.	7 days RICT INSERT
B. One AFW train inoperable for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours RICT INSERT

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ---------- A.1 Restore CCW train to OPERABLE status.	72 hours RICT INSERT
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

3.7 PLANT SYSTEMS

3.7.8 Station Service Water System (SSWS)

LCO 3.7.8 Two SSWS trains and a SSW Pump on the opposite unit with its associated cross-connects shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	A.1 Restore a SSW Pump on the opposite unit to OPERABLE status.	7 days RICT INSERT
	AND	
	A.2 Restore associated cross-connects to OPERABLE status.	7 days RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One SSWS train inoperable.	----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources -- Operating," for emergency diesel generator made inoperable by SSWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops -- MODE 4," for residual heat removal loops made inoperable by SSWS. ----------	
	B.1 ~~NOTE~~ ~~Required Action B.1 is not applicable to Unit 2 during replacement of the SSWS Pump 2-02 (Train B) during Unit 2 Cycle 19.~~	
	Restore SSWS train to OPERABLE status.	72 hours
	~~OR~~	RICT INSERT

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B. (continued)~~	~~B.2 NOTE~~ ~~Required Action B.2 is applicable on a one-time basis to replace SSWS Pump 2-02 (Train B) during Unit 2 Cycle 19. If Unit 2, Train A SSWS becomes inoperable, immediately enter LCO 3.0.3. Regulatory Commitment 5966825 (Attachment 1 to TXX-20086) will be implemented during the 8 day COMPLETION TIME.~~ ~~Restore SSWS train to OPERABLE status.~~	~~8 days~~
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

3.7 PLANT SYSTEMS

3.7.19 Safety Chilled Water

LCO 3.7.19 Two safety chilled water trains shall be OPERABLE

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One safety chilled water train inoperable.	A.1 Restore safety chilled water train to OPERABLE status.	72 hours
	~~OR~~	RICT INSERT
	~~A.2 NOTE~~ ~~Required Action A.2 is applicable on a one time basis to replace Safety Chiller 2-06 (Train B) compressor during Unit 2 Cycle 19. If Train A safety chilled water becomes inoperable, immediately enter LCO 3.0.3. Regulatory Commitment 5900444 (Attachment 2 to TXX-20056) will be implemented during the 7 day COMPLETION TIME.~~ ~~Restore safety chilled water train to OPERABLE status.~~	~~7 days~~
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND	
	A.2 ----------NOTE---------- In MODES 1, 2 and 3, the TDAFW pump is considered a required redundant feature. ---------- Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND	
	A.3 Restore required offsite circuit to OPERABLE status.	72 hours RICT INSERT

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Included for information only.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for the required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 ----------NOTE---------- In MODES 1, 2 and 3, the TDAFW pump is considered a required redundant feature. ---------- Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	
	B.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	24 hours
	OR	
	B.3.2 ----------NOTE---------- The SR need not be performed if the DG is already operating and loaded. ---------- Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	AND	
	B.4.1 ~~NOTE~~ ~~Required Action B.4.1 is not applicable to Unit 2 during replacement of the SSWS Pump 2-02 (Train B) during Unit 2 Cycle 19.~~	
	Restore DG to OPERABLE status.	72 hours
	~~OR~~	RICT INSERT
	~~B.4.2 NOTE~~ ~~Required Action B.4.2 is applicable on a one-time basis to replace SSWS Pump 2-02 (Train B) during Unit 2 Cycle 19. If Unit 2, Train A SSWS becomes inoperable, immediately enter LCO 3.0.3. Regulatory Commitment 5966825 (Attachment 1 to TXX-20086) will be implemented during the 8-day COMPLETION TIME.~~	
	~~Restore DG to OPERABLE status.~~	~~8 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two required offsite circuits inoperable.	C.1 ----------NOTE---------- In MODES 1, 2 and 3, the TDAFW pump is considered a required redundant feature. ----------	
	Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND	
	C.2 Restore one required offsite circuit to OPERABLE status.	24 hours RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One required offsite circuit inoperable. AND One DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition D is entered with no AC power source to any train. ---------- D.1 Restore required offsite circuit to OPERABLE status. OR D.2 Restore DG to OPERABLE status.	 12 hours RICT INSERT 12 hours RICT INSERT
E. Two DGs inoperable.	E.1 Restore one DG to OPERABLE status.	2 hours
F. One SI sequencer inoperable.	F.1 ----------NOTE---------- One required SI sequencer channel may be bypassed for up to 4 hours for surveillance testing provided the other channel is operable. ---------- Restore SI sequencer to OPERABLE status.	 24 hours RICT INSERT
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 5.	6 hours 36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources -- Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two required battery chargers on one train inoperable.	A.1 Restore affected battery(ies) terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	AND	
	A.2 Verify affected battery(ies) float current ≤ 2 amps.	Once per 12 hours
	AND	
	A.3 Restore required battery charger(s) to OPERABLE status.	7 days RICT INSERT

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or two batteries on one train inoperable.	B.1 Restore affected battery(ies) to OPERABLE status.	2 hours RICT INSERT
	~~OR~~	
	~~B.2 NOTE~~ ~~Required Action B.2 is applicable for a one-time basis to replace cell 27 in battery BT1ED2 and cell 41 in battery BT1ED4 during Unit 1 Cycle 20 (not at the same time). If the second battery on the same train becomes inoperable, immediately initiate Required Actions D.1 and D.2. Regulatory Commitment 5644411 (Attachment 2 to TXX-18064) will be implemented during the 18 hour Completion Time.~~ ~~Restore affected battery to OPERABLE status.~~	~~18 hours~~
C. One DC electrical power subsystem inoperable for reasons other than Condition A or B.	C.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours RICT INSERT
D. Required Action and Associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 5.	36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters -- Operating

LCO 3.8.7 The required Train A and Train B inverters shall be OPERABLE.

----------NOTE----------
Inverters may be disconnected from one DC bus for ≤ 24 hours to perform an equalizing charge on their associated common battery, provided:

a. The associated AC vital bus(es) are energized; and

b. All other AC vital buses are energized from their associated OPERABLE inverters.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required inverter inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any vital bus de-energized. ----------	
	Restore inverter to OPERABLE status.	24 hours ← RICT INSERT

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems -- Operating

LCO 3.8.9 Train A and Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One AC electrical power distribution subsystem inoperable.	A.1 Restore AC electrical power distribution subsystem to OPERABLE status.	8 hours RICT INSERT
B. One AC vital bus subsystem inoperable.	B.1 Restore AC vital bus subsystem to OPERABLE status.	2 hours RICT INSERT
C. One DC electrical power distribution subsystem inoperable.	C.1 Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours RICT INSERT
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Two trains with inoperable distribution subsystems that result in a loss of safety function.	E.1 Enter LCO 3.0.3.	Immediately

5.5 Programs and Manuals

5.5.22 Spent Fuel Storage Rack Neutron Absorber Monitoring Program (continued)

In order to ensure the reliability of the Neutron Poison material, a monitoring program is required to routinely confirm that the assumptions utilized in the criticality analysis remain valid and bounding. The Neutron Absorber Monitoring Program is established to monitor the integrity of neutron absorber test coupons periodically as described below.

A test coupon "tree" shall be maintained in each SFP. Each coupon tree originally contained 8 neutron absorber surveillance coupons. Detailed measurements were taken on each of these 16 coupons prior to installation, including weight, length, width, thickness at several measurement locations, and B-10 content (g/cm^2). These coupons shall be maintained in the SFP to ensure they are exposed to the same environmental conditions as the neutron absorbers installed in the Region I storage cells, until they are removed for analysis.

One test coupon from each SFP shall be periodically removed and analyzed for potential degradation, per the following schedule. The schedule is established to ensure adequate coupons are available for the planned life of the storage racks.

Year	Coupon Number	Year	Coupon Number
2013	1	2028	5
2015	2	2033	6
2018	3	2043	7
2023	4	2053	8

Further evaluation of the absorber materials, including an investigation into the degradation and potential impacts on the Criticality Safety Analysis, is required if:

- A decrease of more than 5% in B-10 content from the initial value is observed in any test coupon as determined by neutron attenuation.
- An increase in thickness at any point is greater than 25% of the initial thickness at that point.

INSERT SECTION 5.5.23

CPNPP TS INSERTS

EXAMPLE 1.3-8 INSERT

Example 1.3-8

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Restore subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

When a subsystem is declared inoperable, Condition A is entered. The 7 day Completion Time may be applied as discussed in Example 1.3-2. However, the licensee may elect to apply the Risk Informed Completion Time Program which permits calculation of a Risk Informed Completion Time (RICT) that may be used to complete the Required Action beyond the 7 day Completion Time. The RICT cannot exceed 30 days. After the 7 day Completion Time has expired, the subsystem must be restored to OPERABLE status within the RICT or Condition B must also be entered.

The Risk Informed Completion Time Program requires recalculation of the RICT to reflect changing plant conditions. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

If the 7 day Completion Time clock of Condition A has expired and subsequent changes in plant condition result in exiting the applicability of the Risk Informed Completion Time Program without restoring the inoperable subsystem to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start.

If the RICT expires or is recalculated to be less than the elapsed time since the Condition was entered and the inoperable subsystem has not been restored to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the inoperable subsystems are restored to OPERABLE status after Condition B is entered, Conditions A is exited, and therefore, the Required Actions of Condition B may be terminated.

CPNPP TS INSERT

RICT INSERT

OR

In accordance with the Risk Informed Completion Time Program.

INSERT TS 3.3.1 Condition N

N.	Required Action and associated Completion Time of Condition M not met.	N.1 Reduce THERMAL POWER to < P-7	6 hours

INSERT TS 3.3.1 Condition Q

Q.	Required Action and associated Completion Time of Condition O or P not met.	Q.1 Reduce THERMAL POWER to < P-9	4 hours

INSERT TS 3.3.1 Condition W

W.	Required Action and associated Completion Time of Condition B, D, E, R, S, T or V not met.	W.1 Be in MODE 3.	6 hours

INSERT TS 3.3.1 Condition X

X.	Required Action and associated Completion Time of Condition U not met.	X.1 Be in MODE 2.	6 hours

INSERT TS 3.3.2 Condition M

M.	Required Action and associated Completion Time of Conditions B, C, or K not met.	M.1 Be in MODE 3 **AND** M.2 Be in MODE 5	6 hours 36 hours

INSERT TS 3.3.2 Condition N

N.	Required Action and associated Completion Time of Conditions D, E, F, G, or L not met.	N.1 Be in MODE 3 **AND** N.2 Be in MODE 4	6 hours 12 hours

INSERT TS 3.3.2 Condition O

O.	Required Action and associated Completion Time of Conditions H, I, or J not met.	O.1 Be in MODE 3	6 hours

SECTION 5.5.23 INSERT

5.5.23 Risk Informed Completion Time Program

This program provides controls to calculate a Risk Informed Completion Time (RICT) and must be implemented in accordance with NEI 06-09-A, Revision 0, "Risk-Managed Technical Specifications (RMTS) Guidelines." The program shall include the following:

a. The RICT may not exceed 30 days;

b. A RICT may only be utilized in MODE 1 and 2;

c. When a RICT is being used, any change to the plant configuration, as defined in NEI 06-09-A, Appendix A, must be considered for the effect on the RICT.

    1. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration.

    2. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

    3. Revising the RICT is not required If the plant configuration change would lower plant risk and would result in a longer RICT.

d. For emergent conditions, if the extent of condition evaluation for inoperable structures, systems, or components (SSCs) is not complete prior to exceeding the Completion Time, the RICT shall account for the increased possibility of common cause failure (CCF) by either:

    1. Numerically accounting for the increased possibility of CCF in the RICT calculation; or

    2. Risk Management Actions (RMAs) not already credited in the RICT calculation shall be implemented that support redundant or diverse SSCs that perform the function(s) of the inoperable SSCs, and, if practicable, reduce the frequency of initiating events that challenge the function(s) performed by the inoperable SSCs.

e. The risk assessment approaches and methods shall be acceptable to the NRC. The plant PRA shall be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant, as specified in Regulatory Guide 1.200, Revision 2. Methods to assess the risk from extending the Completion Times must be PRA methods used to support this license amendment, or other methods approved by the NRC for generic use; and any change in the PRA methods to assess risk that are outside these approval boundaries require prior NRC approval.

ATTACHMENT 4
License Amendment Request

Comanche Peak Nuclear Power Plant, Units 1 and 2
NRC Docket Nos. 50-445 and 50-446

Revise Technical Specifications to Adopt Risk-Informed Completion Times TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b"

Cross-Reference of TSTF-505 and CPNPP Technical Specifications

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Completion Times	**1.3**	**1.3**		
Example 1.3-8	[NEW TS] 1.3-8	[NEW TS] 1.3-8	No	The CPNPP TS do not currently contain this example. Example to be added to CPNPP TS to be consistent with TSTF-505. This is a new definition only (i.e., there is no RICT directly applicable to the TS.)
RTS Instrumentation	**3.3.1**	**3.3.1**		
One Manual Reactor Trip channel inoperable.	3.3.1.B.1	3.3.1.B.1	Yes	TSTF-505 changes are incorporated. (Function 1, Manual Reactor Trip)
One Power Range Neutron Flux - High channel inoperable.	3.3.1.D.1.2	3.3.1.D.2.1	Yes	TSTF-505 changes are incorporated. (Function 2.a, Power Range Neutron Flux - High)
One Channel inoperable.	3.3.1.E.1	3.3.1.E.1	Yes	TSTF-505 changes are incorporated. [Note 1]
One channel inoperable.	3.3.1.M.1	3.3.1.L.1	Yes	TSTF-505 changes are incorporated. [Note 2]
Required Action and associated Completion Time of Condition M not met.	[New TS] 3.3.1 N.1	[New TS] 3.3.1.M.1	No	This a new TS "default" condition added consistent with TSTF-505.
One Low Fluid Oil Pressure Turbine Trip channel inoperable	3.3.1.O.1	3.3.1.R.1	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies One Low Fluid Oil Pressure Turbine Trip channel inoperable.) (Function 16.a, Turbine Trip - Low Fluid Oil Pressure)
One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.	3.3.1.P.1	3.3.1.R.1	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies One or more Turbine Stop Valve Closure Trip channel(s) inoperable.) (Function 16.b, Turbine Trip - Turbine Stop Valve Closure)
Required Action and associated Completion Time of Condition O or P not met.	[New TS] 3.3.1 Q	[New TS] 3.3.1.S.1	No	This a new TS "default" condition added consistent with TSTF-505.
One train inoperable.	3.3.1.R.1	3.3.1.T.1	Yes	TSTF-505 changes are incorporated. [Note 3]
One RTB train inoperable.	3.3.1.S.1	3.3.1.U.1	Yes	TSTF-505 changes are incorporated. (Function 19, Reactor Trip Breakers (RTBs))
One or more required channel(s) inoperable.	3.3.1.T.1	3.3.1.V.1	No	TSTF-505 changes are incorporated. [Note 4]

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
One or more required channel(s) inoperable.	3.3.1.U.1	3.3.1.W.1	No	TSTF-505 changes are incorporated. [Note 5]
One trip mechanism inoperable for one RTB.	3.3.1.V.1	3.3.1.Y.1	Yes	TSTF-505 changes are incorporated. (Function 20, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms)
Required Action and associated Completion Time of Condition B, D, E, R, S, T or V not met.	[New TS] 3.3.1 W.1	[New TS] 3.3.1.Z.1	No	This a new TS "default" condition added consistent with TSTF-505.
Required Action and associated Completion Time of Condition U not met.	[New TS] 3.3.1.X.1	[New TS] 3.3.1.X.1	No	This a new TS "default" condition added consistent with TSTF-505.
ESFAS Instrumentation	**3.3.2**	**3.3.2**		
One channel or train inoperable.	3.3.2.B.1	3.3.2.B.1	Yes	TSTF-505 changes are incorporated. [Note 6]
One train inoperable.	3.3.2.C.1	3.3.2.C.1	Yes	TSTF-505 changes are incorporated. [Note 7]
One channel inoperable.	3.3.2.D.1	3.3.2.D.1	Yes	TSTF-505 changes are incorporated. [Note 8]
One Containment Pressure channel inoperable	3.3.2.E.1	3.3.2.E.1	No	TSTF-505 changes are incorporated. [Note 9]
One channel or train inoperable.	3.3.2.F.1	3.3.2.F.1	Yes	TSTF-505 changes are incorporated. [Note 10]
One train inoperable.	3.3.2.G.1	3.3.2.G.1	Yes	TSTF-505 changes are incorporated. [Note 11]
One train inoperable.	3.3.2.H.1	3.3.2.H.1	Yes	TSTF-505 changes are incorporated. [Note 12]
One channel inoperable.	3.3.2.I.1	3.3.2.I.1	Yes	TSTF-505 changes are incorporated. [Note 13]
One Main Feedwater Pumps trip channel inoperable.	3.3.2.J.1	3.3.2.J.1	Yes	TSTF-505 changes are incorporated. [Note 14]
One channel inoperable.	3.3.2.K.1	3.3.2.K.1	No	TSTF-505 changes are incorporated. [Note 15]
One or more channels inoperable	3.3.2.L.1	3.3.2.L.1	No	TSTF-505 changes are incorporated. [Note 16]
Required Action and associated Completion Time of Conditions B, C or K not met.	[New TS] 3.3.2.M.1	[New TS] 3.3.2.M.1	No	This a new TS "default" condition added consistent with TSTF-505.

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Required Action and associated Completion Time of Conditions D, E, F, G or L not met.	[New TS] 3.3.2.N.1	[New TS] 3.3.2.N.1	No	This a new TS "default" condition added consistent with TSTF-505.
Required Action and associated Completion Time of Conditions H, I, or J not met.	[New TS] 3.3.2 O.1	[New TS] 3.3.2.O.1	No	This a new TS "default" condition added consistent with TSTF-505.
LOP DG Start Instrumentation	**3.3.5**	**3.3.5**		
One or more Functions with one channel per bus inoperable.	3.3.5.A.1	3.3.5.A.1	Yes	TSTF-505 changes are incorporated.
Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	3.3.5.B.1	3.3.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies the Preferred offsite source bus undervoltage function inoperable; and TSTF-505 refers to one or more Functions inoperable.) [Note 17]
Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	3.3.5.C.1	3.3.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies the Alternate offsite source bus undervoltage function inoperable; and TSTF-505 refers to one or more Functions inoperable.) [Note 18]
Two channels per bus for the 6.9 kV bus loss of voltage function inoperable	3.3.5.D.1	3.3.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies the 6.9kV buss loss of voltage function inoperable; and TSTF-505 refers to one or more Functions inoperable.) [Note 19]
Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	3.3.5.E.1	3.3.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS specifies the degraded voltage or low grid undervoltage function inoperable; and TSTF-505 refers to one or more Functions inoperable.) [Note 20]
One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	3.3.5.F.1	3.3.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (This Function is treated similar TS 3.3.2.C.1 with a 1 hour CT) [Note 21]

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Pressurizer	**3.4.9**	**3.4.9**		
One required group of pressurizer heaters inoperable.	3.4.9.B.1	3.4.9.B.1	Yes	TSTF-505 changes are incorporated.
Pressurizer Power Operated Relief Valves (PORVs)	**3.4.11**	**3.4.11**		
One PORV inoperable and not capable of being manually cycled.	3.4.11.B.3	3.4.11.B.3	Yes	TSTF-505 changes are incorporated.
One block valve inoperable.	3.4.11.C.2	3.4.11.C.2	Yes	TSTF-505 changes are incorporated.
ECCS -- Operating	**3.5.2**	**3.5.2**		
One train inoperable because of the inoperability of a centrifugal charging pump.	3.5.2.A.1	N/A	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to one train inoperable due to inoperability of a centrifugal charging pump; and TSTF-505 refers to one or more trains and does not specify the cause of inoperability)
One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	3.5.2.B.1	3.5.2.A.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS includes AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available. TSTF-505 does not include this statement.)
Containment Air Locks	**3.6.2**	**3.6.2**		
One or more containment air locks inoperable for reasons other than Condition A or B.	3.6.2.C.3	3.6.2.C.3	Yes	TSTF-505 changes are incorporated.

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Containment Isolation Valves	**3.6.3**	**3.6.3**		
One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.	3.6.3.A.1	3.6.3.A.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TSTF-505 states One or more penetration flow paths with one containment isolation valve inoperable [for reasons other than Condition[s] D [and E]].
One or more penetration flow paths with one containment isolation valve inoperable.	3.6.3.C.1	3.6.3.C.1	Yes	TSTF-505 changes are incorporated.
Containment Spray System	**3.6.6**	**3.6.6**		
One containment spray train inoperable.	3.6.6.A.1	3.6.6.A.1	Yes	TSTF-505 changes are incorporated. CPNPP TS did not contain the second Completion Time for this condition and therefore it was not included in the LAR to adopt TSTF-439.
Main Steam Isolation Valves (MSIVs)	**3.7.2**	**3.7.2**		
One MSIV inoperable in MODE 1.	3.7.2.A.1	3.7.2.A.1	Yes	TSTF-505 changes are incorporated.
Steam Generator Atmospheric Relief Valves (ARVs)	**3.7.4**	**3.7.4**		
One required ARV line inoperable.	3.7.4.A.1	3.7.4.A.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to ARV line and TSTF-505 refers to ADV line.)
Two required ARV lines inoperable.	3.7.4.B.1	3.7.4.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to ARV line and TSTF-505 refers to ADV line.)

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Three or more required ARV lines inoperable.	3.7.4.C.1	N/A	Yes	This is a CPNPP-specific condition with restoration action (i.e., Restore at least two ARV lines to operable status) and a completion time of 24 hours. Vistra OpCo proposes to apply RICT to the existing CPNPP TS 3.7.4, Action C.1.
Auxiliary Feedwater (AFW) System	**3.7.5**	**3.7.5**		
One steam supply to turbine driven AFW pump inoperable.	3.7.5.A.1	3.7.5.A.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS does not include OR One turbine driven AFW pump inoperable in Mode 3 for refueling). The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037).
One AFW train inoperable for reasons other than Condition A.	3.7.5.B.1	3.7.5.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One AFW train inoperable for reasons other than Condition A and TSTF-505 refers to One AFW train inoperable in MODE 1, 2, or 3 for reasons other than Condition A). The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037)
Component Cooling Water (CCW) System	**3.7.7**	**3.7.7**		
One CCW train inoperable.	3.7.7.A.1	3.7.7.A.1	Yes	TSTF-505 changes are incorporated.
Station Service Water System (SSWS)	**3.7.8**	**3.7.8**		
Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	3.7.8.A.1	NA	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to Required SSW Pump on the opposite unit or its associated cross-connects inoperable and TSTF-505 refers to one SWS train inoperable.)

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	3.7.8.A.2	NA	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to Required SSW Pump on the opposite unit or its associated cross-connects inoperable and TSTF-505 refers to one SWS train inoperable.)
One SSWS train inoperable.	3.7.8.B.1	3.7.8.A.1	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One SSWS train inoperable and TSTF-505 refers to one SWS train inoperable.)
One SSWS train inoperable.	3.7.8.B.1	NA	NA	Removal of one-time change to TS 3.7.8, Required Action B. 1 Note and Required Action B.2 (LA 178 - ML21015A212). This change is not related to TSTF-505, Rev 2 as stated in Attachment 1 to original submittal (ML21131A233).
Safety Chilled Water	**3.7.19**	**N/A**		
One safety chilled water train inoperable.	3.7.19.A.1	N/A	Yes	This is a CPNPP-specific Condition with restoration action (i.e., Restore safety chilled water train to OPERABLE status.) and a completion time of 72 hours. Vistra OpCo proposes to apply a RICT to the existing CPNPP TS 3.7.19, Action A.1.
One safety chilled water train inoperable.	3.7.19.A.1	NA	NA	Removal of one-time change to TS 3.7.8, Condition A.2 (LA 175 - ML20223A349). This change is not related to TSTF-505, Rev 2 as stated in Attachment 1 to original submittal (ML21131A233).
AC Sources -- Operating	**3.8.1**	**3.8.1**		
One required offsite circuit inoperable.	3.8.1.A.3	3.8.1.A.3	Yes	TSTF-505 changes are incorporated. The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037)
One DG inoperable.	3.8.1.B.4	3.8.1.B.4	Yes	TSTF-505 changes are incorporated. The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037)

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
One DG inoperable.	3.8.1.B.4	NA	NA	Removal of one-time change to TS 3.8.1, Condition B. 4 Notes and Required Action B.4.2 (LA 178 - ML21015A212). This change is not related to TSTF-505, Rev 2 as stated in Attachment 1 to original submittal (ML21131A233).
Two required offsite circuits inoperable.	3.8.1.C.2	3.8.1.C.2	Yes	TSTF-505 changes are incorporated.
One required offsite circuit inoperable. AND One DG inoperable.	3.8.1.D.1	3.8.1.D.1	Yes	TSTF-505 changes are incorporated.
One required offsite circuit inoperable. AND One DG inoperable.	3.8.1.D.2	3.8.1.D.2	Yes	TSTF-505 changes are incorporated.
One SI sequencer inoperable.	3.8.1.F.1	3.8.1.F.1	Yes	TSTF-505 Changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One SI sequencer inoperable and TSTF-505 refers to One required automatic load sequencer inoperable.
DC Sources -- Operating	**3.8.4**	**3.8.4**		
One or two required battery chargers on one train inoperable.	3.8.4.A.3	3.8.4.A.3	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One or two required battery chargers on one train inoperable and TSTF-505 does not use the word "required.")
One or two batteries on one train inoperable.	3.8.4.B.1	3.8.4.B.1	Yes	TSTF-505 changes are incorporated.
One or two batteries on one train inoperable.	3.8.4.B.1	NA	NA	Removal of one-time change to TS 3.8.4, Condition B. 2 Note and Required Action B.2 (LA 170 - ML18267A384). This change is not related to TSTF-505, Rev 2 as stated in Attachment 1 to original submittal (ML21131A233).

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
One DC electrical power subsystem inoperable for reasons other than Condition A or B.	3.8.4.C.1	3.8.4.C.1	Yes	TSTF-505 changes are incorporated.
Inverters -- Operating	**3.8.7**	**3.8.7**		
One required inverter inoperable.	3.8.7.A.1	3.8.7.A.1	Yes	TSTF-505 changes are incorporated.
Distribution Systems -- Operating	**3.8.9**	**3.8.9**		
One AC electrical power distribution subsystem inoperable.	3.8.9.A.1	3.8.9.A.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One AC electrical power distribution subsystem inoperable and TSTF-505 refers to one or more AC electrical power distribution subsystems inoperable). The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037).
One AC vital bus subsystem inoperable.	3.8.9.B.1	3.8.9.B.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One AC vital bus subsystem inoperable and TSTF-505 refers to One or more AC vital buses inoperable). The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037).

Tech Spec Description	CPNPP TS	TS-505 TS	Apply RICT?	Comments
One DC electrical power distribution subsystem inoperable.	3.8.9.C.1	3.8.9.C.1	Yes	TSTF-505 changes are incorporated. The wording of TSTF-505 varies from CPNPP TS (i.e., TS refers to One DC electrical power distribution subsystems inoperable and TSTF-505 refers to One or more DC electrical power distribution subsystems inoperable). The second Completion Time for this condition was addressed by Vistra OpCo LAR to Adopt TSTF-439 submitted December 19, 2006. (ADAMS Ascension No. ML073400037).
Programs and Manuals	**5.5**	**5.5**		
Programs and Manuals	[New TS] 5.5.23	[New TS] 5.5.18	No	The CPNPP TS do not currently contain this program. The new RICT Program will be added to the CPNPP TS 5.5 consistent with TSTF-505.

NOTES

1. TS 3.3.1 Condition E applies to the following trip inputs;

   - Power Range Neutron Flux - Low (Function 2.b)
   - Power Range Neutron Flux Rate High Positive Rate (Function 3)
   - Overtemperature N-16 (Function 6)
   - Overpower N-16 (Function 7)
   - Pressurizer Pressure - High (Function 8.b)
   - Steam Generator (SG) Water Level - Low-Low (Function 14)

2. TS 3.3.1 Condition M applies to the following trip inputs;

   - Pressurizer Pressure - Low (Function 8.a)
   - Pressurizer Water Level - High (Function 9)
   - Reactor Coolant Flow - Low (Function 10)
   - Undervoltage RCPs (Function 12)
   - Underfrequency RCPs (Function 13)

3. TS 3.3.1 Condition R applies to the following trip inputs;

   - Safety Injection (SI) from Engineered Safety Feature Actuation System (ESFAS) (Function 17)
   - Automatic Trip Logic (Function 21)

4. TS 3.3.1 Condition T applies to the following Reactor Trip System Interlocks;

   - Intermediate Range Neutron Flux, P-6 (Function 18.a)
   - Power Range Neutron Flux, P-10 (Function 18.e)

5. TS 3.3.1 Condition U applies to the following Reactor Trip System Interlocks;

   - Low Power Reactor Trips Block, P-7 (Function 18.b)
   - Power Range Neutron Flux, P-8 (Function 18.c)
   - Power Range Neutron Flux, P-9 (Function 18.d)
   - Turbine First Stage Pressure, P-13 (Function 18.f)

6. TS 3.3.2 Condition B applies to the following ESFAS inputs;

- Safety Injection Manual Initiation (Function 1.a)
- Containment Spray Manual Initiation (Function 2.a)
- Containment Isolation Phase A Manual Initiation (Function 3.a.(1))
- Containment Isolation Phase B Manual Initiation (Function 3.b.(1))

7. TS 3.3.2 Condition C applies to the following ESFAS inputs;

- Safety Injection Automatic Actuation Logic and Actuation Relays (Function 1.b)
- Containment Spray Automatic Actuation Logic and Actuation Relays (Function 2.b)
- Containment Isolation Phase A Automatic Actuation Logic and Actuation Relays (Function 3.a.(2))
- Containment Isolation Phase B Automatic Actuation Logic and Actuation Relays (Function 3.b.(2))
- Automatic Switchover to Containment Sump Automatic Actuation Logic and Actuation Relays (Function 7.a)

8. TS 3.3.2 Condition D applies to the following ESFAS inputs;

- Safety Injection Containment Pressure - High 1 (Function 1.c)
- Safety Injection Pressurizer Pressure - Low (Function 1.d)
- Safety Injection Steam Line Pressure - Low (Function 1.e)
- Steam Line Isolation Containment Pressure - High 2 (Function 4.c)
- Steam Line Isolation Steam Line Pressure - Low (Function 4.d.(1))
- Steam Line Isolation Steam Line Pressure Negative Rate - High (Function 4.d.(2))
- Auxiliary Feedwater SG Water Level - Low-Low (Function 6.c)

9. TS 3.3.2 Condition E applies to the following ESFAS inputs;

- Containment Spray Containment Pressure - High 3 (Function 2.c)
- Containment Isolation Phase B Containment Pressure - High 3 (Function 3.b.(3))

10. TS 3.3.2 Condition F applies to the following ESFAS inputs;

- Steam Line Isolation Manual Initiation (Function 4.a)
- Auxiliary Feedwater Loss of Offsite Power (Function 6.e)
- ESFAS Interlocks Reactor Trip, P-4 (Function 8.a)

11. TS 3.3.2 Condition G applies to the following ESFAS inputs;

    - Steam Line Isolation Automatic Actuation Logic and Actuation Relays (Function 4.b)
    - Auxiliary Feedwater Automatic Actuation Logic and Actuation Relays (Solid State Protection System) (Function 6.a)

12. TS 3.3.2 Condition H applies to the following ESFAS inputs;

    - Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays (Function 5.a)

13. TS 3.3.2 Condition I applies to the following ESFAS inputs;

    - Turbine Trip and Feedwater Isolation SG Water Level High-High (P-14) (Function 5.b)

14. TS 3.3.2 Condition J applies to the following ESFAS inputs;

    - Auxiliary Feedwater Trip of all Main Feedwater Pumps (Function 6.g)

15. TS 3.3.2 Condition K applies to the following ESFAS inputs;

    - Automatic Switchover to Containment Sump Refueling Water Storage Tank (RWST) Level Low-Low (Function 7.b)

16. TS 3.3.2 Condition L applies to the following ESFAS inputs;

    - ESFAS Interlocks Pressurizer Pressure, P-11 (Function 8.b)

17. TS 3.3.5 Condition B applies to the following Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions;

    - Preferred offsite source bus undervoltage (Function 2)

18. TS 3.3.5 Condition C applies to the following Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions;

    - Alternate offsite source bus undervoltage (Function 3)

19. TS 3.3.5 Condition D applies to the following Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions;

    - 6.9 kV Class 1E bus undervoltage (Function 4)

20. TS 3.3.5 Condition E applies to the following Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions;

- 6.9 kV Class 1E bus degraded voltage (Function 5)
- 480 V Class 1E bus low grid undervoltage (Function 6)
- 480 V Class 1E bus degraded voltage (Function 7)

21. TS 3.3.5 Condition F applies to the following Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions;

- Automatic Actuation Logic and Actuation Relays (Function 1)

ENCLOSURE 1
License Amendment Request

Comanche Peak Nuclear Power Plant, Units 1 and 2
NRC Docket Nos. 50-445 and 50-446

Revise Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b"

List of Required Actions to Corresponding PRA Functions

1.0 Introduction

Section 4.0, "Limitations and Conditions", Item 2 of the NRC Final Safety Evaluation [Ref. 1] for NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk Managed Technical Specifications (RMTS) Guidelines", Revision 0 [Ref. 2], identifies the following needed content:

- The license amendment request (LAR) will provide identification of the TS Limiting Conditions for Operation (LCOs) and action requirements to which the RMTS will apply.
- The LAR will provide a comparison of the TS functions to the PRA modeled functions of the structures, systems, and components (SSCs) subject to those LCO actions.
- The comparison should justify that the scope of the PRA model, including applicable success criteria such as number of SSCs required, flow rate, etc., are consistent with licensing basis assumptions (i.e., 50.46 [Emergency Core Cooling System (ECCS)] flowrates) for each of the TS requirements, or an appropriate disposition or programmatic restriction will be provided.

This enclosure provides confirmation that the Comanche Peak Nuclear Power Plant (CPNPP) PRA models include the necessary scope of SSCs and their functions to address each proposed application of the Risk-Informed Completion Time (RICT) Program to the proposed scope TS LCO Conditions, and provides the information requested for Section 4.0, Item 2 of the NRC Final Safety Evaluation. The scope of the comparison includes each of the TS LCO conditions and associated required actions within the scope of the RICT Program.

2.0 In Scope TS/LCO to Corresponding PRA Functions

Table E1-1, "In Scope TS/LCO Conditions to Corresponding PRA Functions" lists each TS LCO Condition to which the RICT Program is proposed to be applied and documents the following information regarding the TSs with the associated safety analyses, the analogous PRA functions, and the results of the comparison:

- Column "Tech Spec Description": Lists all LCOs and condition statements within the scope of the RICT Program.
- Column "SSCs Covered by TS LCO Condition": Lists SSCs addressed by each action requirement.
- Column "Modeled in PRA?": Indicates whether the SSCs addressed by the TS LCO Condition are included in the PRA.
- Column "Function Covered by TS LCO Condition": Lists a summary of the required functions from the design basis analyses.
- Column "Design Success Criteria": A summary of the success criteria from the design basis analyses.
- Column "PRA Success Criteria": The function success criteria modeled in the PRA.
- Column "Comments": Provides the justification or resolution to address any inconsistencies between the TS and PRA functions regarding the scope of SSCs and the success criteria. Where the PRA scope of SSCs is not consistent with the TS, additional information is provided to describe how the LCO condition can be evaluated using appropriate surrogate events. Differences in the success criteria for TS functions are addressed to demonstrate the PRA criteria provide a realistic estimate of the risk of the TS condition as required by NEI 06-09-A, Revision 0.

The corresponding SSCs for each TS LCO and the associated TS functions are identified and compared to the PRA. This description also includes the design success criteria and the applicable PRA success criteria. Any differences between the scope or success criteria are described in the table. Scope differences are justified by identifying appropriate surrogate events which permit a risk evaluation to be completed using the Configuration Risk Management Program tool for the RICT Program. Differences in success criteria typically arise due to the requirement in the American Society of Mechanical Engineers (ASME)/American Nuclear Society

(ANS) RA-Sa-2009 PRA Standard (hereafter "ASME/ANS PRA Standard") to make PRAs realistic rather than bounding, whereas design basis criteria are necessarily conservative and bounding. The use of realistic success criteria is necessary to conform to capability Category II of the ASME/ANS PRA standard as required by NEI 06-09-A, Revision 0.

3.0 In Scope TS/LCO Conditions RICT Estimate

Table E1-2, "In Scope TS/LCO Conditions RICT Estimate" provides examples of calculated RICT for each individual Condition to which the RICT applies (assuming no other SSCs modeled in the PRA are unavailable). These example calculations demonstrate the scope of the SSCs covered by TSs modeled in the PRA. RICTs were calculated for both units and while the results were generally similar, the most limiting RICT is shown in Table E1-2. Also note that the more limiting of the core damage frequency (CDF) and large early release frequency (LERF) RICT result is shown.

Following implementation of the RICT Program, the actual RICT values will be calculated on a unit-specific basis, using the actual plant configuration and the current revision of the PRA model representing the as-built, as-operated condition of the plant, as required by NEI 06-09-A and the NRC Final Safety Evaluation. The actual RICT values may differ from the RICTs presented in this enclosure.

Table E1-3, "Conditions Requiring Additional Technical Justification," contains a list of Required Actions proposed for inclusion in the RICT Program. Additional technical justification is provided to explain why the Condition would not represent a loss of specified safety function as used in the RICT program.

4.0 Evaluation of Instrumentation and Control Systems

In accordance with TSTF-505, Revision 2, Safety Evaluation "Evaluation of Instrumentation and Control Systems" the following is intended to describe the redundant, diverse, and defense-in-depth attributes of the functions for the Reactor Trip System (RTS) Instrumentation, the Engineered Safety Feature Actuation System (ESFAS) Instrumentation, and the LOP DG Start Instrumentation systems.

For the purposes of this evaluation the following definitions are provided;

Redundancy - Parameters that are used for indication of an unsafe condition have redundant measurement systems. Sufficient redundant measurements are provided to allow a coincident logic scheme so that a spurious measurement on one channel will not cause nor prevent a reactor trip or safeguard feature actuation. (Example: the use of four separate Power Range Channels to monitor Reactor Power.)

One exception to this rule is the source and intermediate range instruments. They have a coincidence in which actuation of protective features occurs on a single input, but these instruments are not in service at power.

The degree of redundancy is the difference between the number of channels monitoring a Function and the number of channels which when tripped will cause a reactor trip, an ESFAS actuation, or a LOP DG start.

Further redundancy is provided by having two trains of protection logic, two trains of SSPS, with either train being capable of initiating a full train of protective functions. The minimum degree of redundancy is the degree of redundancy below which operation is prohibited or otherwise restricted by Technical Specifications.

RTS and ESFAS are each redundant safety systems. No single failure will cause or prevent a reactor trip or ESFAS actuation. Each redundant channel is powered by an independent power

supply, and a loss of power will place the channel output bistable in a trip condition. The three exceptions to this scheme are Containment Spray, RWST Auto Switchover, and permissive P-6.

The instrumentation and control systems provide equipment diversity and functional diversity. Equipment diversity provides different types of instruments to achieve the same Function. Functional diversity uses different variables to achieve a backup Function. For example, a loss of RCS flow is primarily monitored, and the reactor is tripped due to low RCS flow. The undervoltage and underfrequency RCP trips provide diversity to the RCS low flow trip.

This feature and the other listed features meet the "single failure" criteria for RPS, by meeting the IEEE Standard 279 1971's single failure criteria. IEEE 279 1971 requires that any single failure within the protection system not prevent proper protection system action when required.

Redundant channels and trains are electrically isolated and physically separated so that any single failure within a channel or train will not prevent protective action at the system level when required. Channel independence is carried throughout the systems.

Independence - Each channel of measurement and each train of protection is physically and electrically independent. Components of different channels are physically separated, penetrate the containment at different locations, and are supplied by independent electrical power supplies. Independence ensures that a single malfunction or casualty will interrupt only one of the redundant channels or trains. The systems (channels and trains) are also designed such that no single failure will cause a loss of Function.

Physical separation is used to the maximum extent practical to maintain the integrity of redundant protection system instrument channels, providing independence for each channel. There are four separate process protection analog sets. Physical separation of the redundant analog protection channels originates at the process sensors and continues through the field wiring and containment penetrations to the analog protection racks.

Diversity - Several different methods are used to perform similar functions or to indicate the same casualty. For example: Excessive localized fuel element power (KW/FT) protection is provided by both the Power Range Nuclear Instruments and by ion chambers measuring gamma flux in the reactor coolant from Nitrogen 16 decay (N-16 Detectors). Several parameters are also used for protection against a departure from nucleate boiling (DNB) in the Reactor Core.

Certain reactor trips are automatically or manually bypassed at low power when they are not required for safety. For a function to be bypassed, a series of conditions or permissives must be met. The bypass circuit design is such that the bypass is automatically removed whenever the permissive conditions are not met.

Defense-In-Depth (DID) - For this evaluation the seven considerations from Regulatory Guide 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" are used to review impact of proposed change on function defense-in-depth philosophy.

1. Preserve a reasonable balance among the layers of defense.
2. Preserve adequate capability of design features without an overreliance on programmatic activities as compensatory measures.
3. Preserve system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty.
4. Preserve adequate defense against potential CCFs.
5. Maintain multiple fission product barriers.
6. Preserve sufficient defense against human errors.
7. Continue to meet the intent of the plant's design criteria.

DID is enhanced by minimizing the chances for a common mode failure through the use of anticipatory trips such as that provided when the turbine trips above 50% power which initiates a reactor trip signal from the turbine tripping independent of any process signals.

Anticipatory trips function to prevent or minimize the severity of an undesired plant event (transient). The systems also use alarms and actions in a layered approach for DID. For example, Overtemperature N-16 and Overpower N-16 provide reactor trip signals at specified setpoints. The two parameters also provide turbine runbacks at a setpoint below the setpoints of the trips.

Automatic Actuation Logic and Actuation Relays are provided in the Solid State Protection System (SSPS). The SSPS equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of SSPS, each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide ESF actuation for the unit. If both trains are taken out of service or placed in test, a reactor trip will result. Each train is packaged in its own cabinet for physical and electrical separation to satisfy separation and independence requirements.

The SSPS performs the decision logic for most ESF equipment actuation; generates the electrical output signals that initiate the required actuation; and provides the status, permissive, and annunciator output signals to the main control room of the unit.

The bistable outputs from the signal processing equipment are sensed by the SSPS equipment and combined into logic matrices that represent combinations indicative of various transients. If a required logic matrix combination is completed, the system will send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition.

The SSPS energizes the master relays appropriate for the condition of the unit. Each master relay then energizes one or more slave relays, which then cause actuation of the end devices.

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. For example, Pressurizer Pressure-Low is a primary actuation signal for small loss of coolant accidents (LOCAs) and a backup actuation signal for steam line breaks (SLBs) outside containment. Functions such as manual initiation, not specifically credited in the accident safety analysis, are qualitatively credited. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. These Functions may also serve as backups to Functions that were credited in the accident analysis.

The LCO generally requires OPERABILITY of four or three channels in each instrumentation function and two channels in each logic and manual initiation function. The two-out-of-three and the two-out-of-four configurations allow one channel to be tripped during maintenance or testing without causing an ESFAS initiation. Two logic or manual initiation channels are required to ensure no single random failure disables the ESFAS. The required channels of ESFAS instrumentation provide unit protection in the event of any of the analyzed accidents.

4.1 3.3.1 Reactor Trip System (RTS) Instrumentation

The RTS initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and Reactor Coolant System (RCS) pressure boundary during anticipated operational occurrences (AOOs) and to assist the Engineered Safety Features (ESF) Systems in mitigating accidents.

The RTS design creates defense-in-depth due to the redundancy of the channels for each Function in Table 3.3.1-1, "Reactor Trip System Instrumentation."

- Each Function has multiple channels.
- Each Function will cause a reactor trip with one-out-of-two (1/2), two-out-of-three (2/3), or two-out-of-four (2/4) coincidence trip signals.
- A bypassed channel does not initiate a trip signal. It reduces the number of total available channels from (1/2) to (1), (2/3) to (2/2), or (2/4) to (2/3) coincidence to trip.
- A channel placed in a tripped condition will provide a tripped input for the applicable Function.
- Manual reactor trip handswitches provide diversity and DID for all automatic reactor trips

See Table E1-5, "Reactor Trip Systems (RTS) Instrumentation Functions" for redundancy discussion.

4.2 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

The ESFAS initiates necessary safety systems, based on the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary, and to mitigate accidents.

The ESFAS design creates defense-in-depth due to the redundancy of the channels for each Function in Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation."

- Each Function has multiple channels.
- Each Function will cause an ESFAS actuation with one-out-of-two (1/2), two-out-of-three (2/3), or two-out-of-four (2/4) coincidence trip signals.
- A bypassed channel does not initiate an actuation signal. It reduces the number of total available channels from (1/2) to (1), (2/3) to (2/2), or (2/4) to (2/3) coincidence to actuate.
- A channel placed in a tripped condition will provide a tripped input for the applicable Function.

ESFAS redundant channels and trains are electrically isolated and physically separated so that any single failure within a channel or train will not prevent protective action at the system level when required. Channel independence is carried throughout the system.

No single failure will prevent the ESFAS from generating the proper actuation signal on demand for an engineered safety feature. Failures are either in the safe direction or a redundant channel or train ensures the necessary actuation capability.

See Table E1-6, "Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions" for redundancy discussion.

The following information is from CPNPP Design Bases Document, EE-DBD-021, Reactor Protection and NSSS Related Control Systems, Table 1, "Reactor Protection System Diversity." This augments the information provided in Table E1-4, "Evaluation of Instrumentation and Control Systems." Table E1-4 only covers the accidents from CPNPP FSAR, Chapter 15, "Accident Analysis." The following table includes the accidents analyzed as well as other events that rely on TS Instrumentation systems.

See Table E1-8, "Event Protection and Diverse Functions" for redundancy, independence, diversity, and defense-in-depth Functions discussion.

4.3 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9 kv bus.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of power, consists of the following functions:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9kV Class 1E buses loss of voltage,
- 480V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480V Class 1E buses degraded voltage.

Each function consists of two sensing relays per bus that provide input to two-out-of-two logic.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents, in which a loss of offsite power is assumed.

The LCO for LOP DG start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. The two-out-of-two logic minimizes the probability of spurious DG starts due to instrument failure while maintaining a robust LOP DG Start system. Two trains of Automatic Actuation Logic and Actuation Relays shall also be OPERABLE in MODES 1, 2, 3 and 4.

The six Functions described above provide redundant signals to start a DG due to undervoltage or degraded voltage on the 6.9 kV buses. This provides defense-in-depth by, preserving adequate capability of design features without an overreliance on programmatic activities as compensatory measures and preserves system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty. When any of the six Functions described above become inoperable or when one or more Automatic Actuation Logic and Actuation Relays trains become inoperable, within one hour the Function must be restored or entry into LCO 3.8.1, "AC Sources -- Operating" for the applicable Condition is required for offsite power sources or diesel generator. For the Functions that are bus related entry into LCO 3.8.9, "Distribution Systems -- Operating" is entered.

The LOP DG Start design creates defense-in-depth due to the redundancy of the channels for each Function in Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation."

- Each Function has multiple channels.
- Functions 2, 3, 4, 5, 6, and 7 (LCO 3.3.5, Conditions B, C, D, and E) are considered as a functional grouping. Not more than one Condition will be entered at one time. The following NOTE will be added;

----------NOTE----------
RICT entry is not permitted for more than one Condition at a time for Conditions B, C, D or E.

This will ensure that multi-layered, redundant inputs are available for LOP DG Start Instrumentation. With this new NOTE the intent of NUREG-1431, "Standard Technical Specifications — Westinghouse Plants" is maintained. CPNPP utilizes Conditions B, C, D, and E to administer Condition B in the standard. Please refer to Attachment 2, "Proposed Technical Specification Changes - Supplement."

See Table E1-7, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions" for redundancy discussion.

In summary, CPNPP instrumentation systems as described in TS 3.3, employ input parameters and equipment that provide redundancy, independence, diversity, and a defense-in-depth (DID) philosophy as described in Regulatory Guide 1.174, Revision 4.

1. Preserve a reasonable balance among the layers of defense.

The RTS, ESFAS and LOP DG Start instrumentation systems use multiple layers of defense as they rely on redundant, independent, and diverse means to trip the reactor, actuate ESF components, and provide a LOP DG start. In all cases manual operator action provides a final layer of defense if all automatic actions fail. Plant response to events normally has at least one primary protection input with backups as described in preceding table, Event Protection and Diversity, for RTS and ESFAS. Preceding Table, LOP DG Start Signals indicates that train redundancy provides independent and diverse layers of defense from a partial loss of Function as given in TS 3.3.5, Conditions A and F. Conditions B, C, D, and E are viewed as providing layers of redundancy by utilizing undervoltage or degraded voltage from diverse signals.

2. Preserve adequate capability of design features without an overreliance on programmatic activities as compensatory measures.

The RTS, ESFAS, and LOP DG Start instrumentation systems only rely on programmatic actions and compensatory measures when no other action is available. For the RTS and ESFAS systems programmatic actions are confined to actions taken to comply with Required Actions in their respective Technical Specifications which are captured in Operations Administrative procedure ODA-308, "LCO Tracking Program." Also, the TS provides actions to take when a Completion Time will not be met. The LOP DG Start Instrumentation confines actions to those required by LCO 3.3.5 which restore the channel or declare associated offsite power source, applicable 6.9 kV buses, or the associated DG inoperable.

3. Preserve system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty.

For the RTS, a loss of RCS flow/Locked rotor shows the redundancy, independence, and diversity commensurate with a loss of Reactor Coolant flow. Two low flow trip signals are provided; above P-7 (10% power) but below P-8 (48% power) two-out-of-four low flow channels are required to trip the reactor, above P-8 one-out-of-four low flow channels are required to trip the reactor.
A Reactor Coolant Pump (RCP) undervoltage trip is provided which anticipates a loss of RCS flow and is independent from the flow channels. An RCP underfrequency trip is provided which anticipates a loss of RCS flow and is independent from the flow channels and the RCP undervoltage channel. Also, a Pressurizer Pressure high is provided that could trip the reactor during an RCS loss of flow or locked rotor.

For the ESFAS, a Safety Injection (SI) is initiated by the redundant, independent, and diverse inputs commensurate with the accidents that cause a safety injection. An SI can be initiated by one-of-two handswitches on the Main Control Board (MCB). An SI is automatically initiated by a Containment Pressure - High 1, a Pressurizer Pressure Low, or a Steam Line Pressure Low. All of these signals are independent from each other, they are diverse in that monitor and actuate on completely different parameters, and they provide DID as they are layered. Depending on the event; LOCA, SGTR, Main Steam Line fault, or Main Feedwater Line Break each of the independent signals could be the first to respond.

For the LOP DG Start, the inputs are redundant, independent, and diverse. Power to the safety-related 6.9 kV buses is protected by the system design. A single channel cannot cause or prevent a DG start. A single Function failure must be restored or placed in a tripped condition within 6 hours. Automatic Actuation Logic and Actuation Relays trains inoperable must be

restored within 1 hour or the associated DG is declared inoperable. In both cases the other redundant train maintains the safety function. The other LOP DG starts are a group of inputs that will start the associated DG under the following conditions;

- Preferred offsite source bus undervoltage
- Alternate offsite source bus undervoltage
- 6.9 kV Class 1E bus undervoltage
- 6.9 kV Class 1E bus degraded voltage
- 480 V Class 1E bus low grid undervoltage
- 480 V Class 1E bus degraded voltage

These channels are independent from each other and are a diverse group of parameters which can cause a DG start. The DID layering begins at the source for 1E power with the two offsite source undervoltage, a second layer adds 6.9 kV 1E bus undervoltage, a third layer provides for 6.9 kV 1E bus degraded voltage, a fourth layer adds the 480 V 1E bus grid undervoltage, and a fifth layer provides for 480 V 1E bus degraded voltage.

4. Preserve adequate defense against potential CCFs.

Common Cause Failures (CCF) are avoided by the redundancy, independence, diversity, and DID philosophy that are in the plant design. The preceding tables provide primary trip and ESFAS signals for Functions. The tables show how diverse signals are available to support the Function and that the diversity minimizes or eliminates CCFs. System and Function diversity and DID are also shown when the required coincidence changes based on interlocks with the RTS and ESFAS systems. Most CCFs are eliminated by train related Functions. The remaining train can actuate the required signal when needed.

5. Maintain multiple fission product barriers.

The RTS provides trips that are designed to maintain the fuel cladding intact. Specifically, the Power Range Neutron Flux High, Power Range Neutron Flux Rate Positive High, Overtemperature N-16, and Overpower N-16 trips respond to power excursions minimizing the stress to the fuel cladding. These trips act to protect the fuel cladding (fission product barrier).

The Pressurizer Pressure High and the Pressurizer Water Level High in conjunction with the Pressurizer Power Operated Relief Valves (PORV) and Pressurizer Safety Valves to limit the pressure in the RCS. These trips and components act to protect the RCS piping (fission product barrier).

The ESFAS actuations focus on keeping the reactor core cooled and maintaining the Containment below design temperature and pressure. The three automatic SI actuation signals respond to potential challenges to Containment integrity. Containment Pressure High 1 initiates a safety injection based on rising pressure in the Containment. Pressurizer Pressure Low is an indication that a LOCA is in progress that could challenge Containment integrity. Steam Line Pressure Low is an indication of either a steam line break or a feedwater line break. Either break if inside Containment could challenge Containment integrity.

Containment isolation signals are designed to protect Containment integrity. When a Safety Injection is actuated, Containment Phase A Isolation is actuated to isolate non-essential penetrations. Containment Phase A Isolation actuates a Containment Ventilation Isolation to ensure ventilation into and out of Containment are isolated. Steam Line Isolation is actuated by either Steam Line Pressure Low or Containment Pressure High 2 to close the Main Steam Isolation Valves (MSIV) to further ensure Containment integrity. Containment Pressure High 3 initiates Containment Spray and Containment Phase B Isolation. Containment Spray acts to lower Containment temperature and pressure. Containment Phase B isolation isolates Component Cooling Water (CCW) to the RCPs inside Containment. CCW will not be required in this condition as the RCPs are secured. With Containment isolated and Containment Spray actuated the Containment integrity is maintained (Fission product barrier).

6. Preserve sufficient defense against human errors.

Operator errors are minimized by a multi-layered approach. Most actions taken by operators are given in written procedures that have gone through 10 CFR 50.59 review. Control board and plant labelling minimize errors as they provide a positive component verification prior to operation. The protection system is designed so that a single failure will not cause or prevent an actuation when needed. The test procedures for the protection system ensure the steps taken will not lead to an inadvertent actuation. There is also a "fail-safe" element in the design. For example, most components actuated by the protection system are actuated when an input de-energizes, so a loss of power takes the system to a safe position. There are some exceptions and they are based on positive actions to initiate Containment Spray and switchover of the suctions for ECCS and Containment Spray pumps to the Containment Sumps when RWST level reaches a specific level. These signal energize to actuate. This is a case also where the operator may play a significant role if the automatic actuation fails.

7. Continue to meet the intent of the plant's design criteria.

The plant design criteria are not changed by the license amendment request to adopt TSTF-505, Revision 2. The PRA and design review have not identified any significant safety concern by extending the Completion Times when implemented by the submitted program. Any LCOs that may have challenged the plant's design criteria have not been submitted for inclusion in the RICT program. Particularly, CPNPP has not submitted changes for low MODE conditions.

5.0 Tables

E1-1, "In Scope TS/LCO Conditions to Corresponding PRA Functions"

E1-2, "In Scope TS/LCO Conditions RICT Estimate"

E1-3, "Conditions Requiring Additional Technical Justification"

E1-4, "Evaluation of Instrumentation and Control Systems"

E1-5, "Reactor Trip System (RTS) Instrumentation Functions"

E1-6, "Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions"

E1-7, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Functions"

E1-8, "Event Protection and Diverse Functions"

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.1.B	One Manual Reactor Trip channel inoperable	Two Manual Reactor Trip channels	Yes	Reactor Trip Initiation	One of two reactor trip channels	Same	Mapped to modeled components. (Note 4)
3.3.1.D	One Power Range Neutron Flux-High channel inoperable.	Four Power Range Neutron Flux-High channels	Yes	Reactor Trip Initiation	Two of four channels	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function. (Notes 1 and 2)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.1.E	One channel inoperable.	Four Power Range Flux Low channels Four Power Range Neutron Flux Rate High Positive Rate channels Four Overtemperature N-16 channels Four Overpower N-16 channels Four Pressurizer Pressure- High channels Four SG Water Level Low-Low channels	Yes	Reactor Trip Initiation	Two of Four Power Range Flux Low channels Two of Four Power Range Neutron Flux Rate High Positive Rate channels Two of Four Overtemperature N-16 channels Two of Four Overpower N-16 channels Two of Four Pressurizer Pressure- High channels Two of Four SG Water Level Low-Low channels	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function. (Notes 1 and 2)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.1.M	One channel inoperable.	Four Pressurizer Pressure Low channels Three Pressurizer Water Level High channels Three Reactor Coolant Flow Low channels per loop Four Undervoltage RCPs Four Underfrequency RCPs channels	Yes	Reactor Trip Initiation	Two of Four Pressurizer Pressure Low channels Two of Three Pressurizer Water Level Low channels Two of Three Reactor Coolant Flow Low channels per loop Two of Four Undervoltage RCPs Two of Four Underfrequency RCPs channels	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function. (Notes 1 and 2)
3.3.1.O	One Low Fluid Oil Pressure Turbine Trip channel inoperable.	Three Low Fluid Oil pressure channels	Yes	Reactor Trip Initiation	Two of Three channels	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.1.P	One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.	Four Turbine Stop Valve Closure channels (One for each valve)	Yes	Reactor Trip Initiation	Four of Four channels	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function. (Note 11)
3.3.1.R	One train inoperable.	Two Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS) trains Two Automatic Trip Logic trains	Yes	Reactor Trip Initiation	One of Two Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS) trains One of Two Automatic Trip Logic trains	Same	RTS is modeled in the CPNPP PRA using two generic RX Trip logics, one four channel instrument loop and one three channel instrument loop based on every trip that would generate at least two sets of signals. For the RICT program, if the components were not explicitly modeled, they were mapped to one of the two logics based on the number of channels and their impact on the function.
3.3.1.S	One RTB train inoperable.	Two Reactor Trip Breaker (RTB) trains	Yes	Reactor Trip Initiation	One of Two RTBs open	Same	Mapped to modeled components. (Note 3)
3.3.1.V	One trip mechanism inoperable for one RTB.	RTB Undervoltage and Shunt trip mechanisms	Yes	Reactor Trip Initiation	One trip mechanism	Same	Mapped to modeled components. (Note 4)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.2.B	One channel or train inoperable.	Two Manual Initiation Safety Injection channels Two Manual Initiation Containment Spray channels (per train) Two Manual Initiation Phase A Containment Isolation channels Two Manual Initiation Phase B Containment Isolation channels	Yes	ESF Actuation	One of Two Manual Initiation Safety Injection channels One of Two Manual Initiation Containment Spray channels (per train) One of Two Manual Initiation Phase A Containment Isolation channels One of Two Manual Initiation Phase B Containment Isolation channels	Same	Mapped to modeled components.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.2.C	One train inoperable.	Two Safety Injection Automatic Actuation Logic and Actuation Relays trains Two Containment Spray Automatic Actuation Logic and Actuation Relays trains Two Phase A Containment Isolation Automatic Actuation Logic and Actuation Relays trains Two Phase B Containment Isolation Automatic Actuation Logic and Actuation Relays trains Two Automatic Switchover to Containment Sump Automatic Actuation Logic and Actuation Relays trains	Yes	ESF Actuation, P- 14: Trips Main Feed Pumps, Trips Main Turbine, Closes Feedwater Isolation and Discharge Valves	One of Two Safety Injection Automatic Actuation Logic and Actuation Relays trains One of Two Containment Spray Automatic Actuation Logic and Actuation Relays trains One of Two Phase A Containment Isolation Automatic Actuation Logic and Actuation Relays trains One of Two Phase B Containment Isolation Automatic Actuation Logic and Actuation Relays trains One of Two Automatic Switchover to Containment Sump Automatic Actuation Logic and Actuation Relays trains	Same	Mapped to modeled components. Surrogates used for certain components (relays) are conservatively mapped based on their effect on the function.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.2.D	One channel inoperable.	Three Safety Injection Containment Pressure – High 1 channels Four Safety Injection Pressurizer Pressure – Low channels Three (per line) Safety Injection Steam Line Pressure Low channels Three Steam Line Isolation Containment Pressure – High 2 channels Three (per line) Steam Line Isolation Steam Line Pressure Low channels Three (per line) Steam Line Isolation Negative Rate – High channels Four (per SG) Auxiliary Feedwater SG Water Level Low-Low channels	Yes	ESF Actuation	Two of Three Safety Injection Containment Pressure – High 1 channels Two of Four Safety Injection Pressurizer Pressure – Low channels Two of Three (per line) Safety Injection Steam Line Pressure Low channels Two of Three Steam Line Isolation Containment Pressure – High 2 channels Two of Three (per line) Steam Line Isolation Steam Line Pressure Low channels Two of Three (per line) Steam Line Isolation Negative Rate – High channels Two of Four (per SG) Auxiliary Feedwater SG Water Level Low-Low channels	Same	Mapped to modeled components.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.2.F	One channel or train inoperable.	Two Steam Line Isolation Manual Initiation channels Two Auxiliary Feedwater Loss of Offsite Power channels Two ESFAS Interlocks Reactor Trip channels (P-4)	Yes	ESF Actuation	One of Two Steam Line Isolation Manual Initiation channels One of Two Safety Injection Loss of Offsite Power channels One of Two ESFAS Interlocks Reactor Trip channels	Same	Mapped to modeled components. Surrogates used for certain components (hand switch/relays) are conservatively mapped based on their effect on the function.
3.3.2.G	One train inoperable.	Two Steam Line Isolation Automatic Actuation Logic and Actuation Relays trains Two Auxiliary Feedwater Automatic Actuation Logic and Actuation Relays trains	Yes	ESF Actuation	One of Two Steam Line Isolation Automatic Actuation Logic and Actuation Relays trains One of Two Auxiliary Feedwater Automatic Actuation Logic and Actuation Relays trains	Same	Mapped to modeled components. Surrogates used for certain components (hand switch/relays) are conservatively mapped based on their effect on the function.
3.3.2.H	One train inoperable	Two Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays trains	Yes	ESF Actuation	One of Two Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays trains	Same	Mapped to modeled components. Surrogates used for certain components are conservatively mapped based on their effect on the function.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.2.I	One channel inoperable.	Three (per SG) Turbine Trip and Feedwater Isolation SG Water Level – High-High (P-14) channels	Yes	ESF Actuation	Two of Three (per SG) Turbine Trip and Feedwater Isolation SG Water Level – High-High (P-14) channels	Same	Mapped to modeled components.
3.3.2.J	One Main Feedwater Pump trip channel inoperable.	All Main Feedwater Pumps trip channels	Yes	ESF Actuation	One of two per AFW pump	Same	Mapped to modeled components. Surrogates used for certain components (switch/relays) are conservatively mapped based on their effect on the function.
3.3.5.A	One or more Functions with one channel per bus inoperable	Sustained undervoltage (SUR), Transient undervoltage (TU) and Loss of voltage (LOV) sensors on safety related 6.9kV buses	Yes	Diesel Generator Start Instrumentation - Loss of Power	One of Two channels (per bus) of the loss of voltage and undervoltage Functions One of two trains of Automatic Actuation Logic and Actuation Relays	Same	Mapped to modeled components. Surrogates used for certain components (relays) are conservatively mapped based on their effect on the function.
3.3.5.B	Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	Two (per bus) preferred offsite source bus undervoltage channels	Yes	Diesel Generator Start Instrumentation - Loss of Power	Two of Two undervoltage channels on each preferred offsite source bus	Same	Surrogates used for components (relays) are conservatively mapped based on their effect on the function. (Notes 5 and 6)
3.3.5.C	Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	Two (per bus) Alternate offsite source bus undervoltage channels	Yes	Diesel Generator Start Instrumentation - Loss of Power	Two of Two undervoltage channels on each alternate offsite source bus	Same	Surrogates used for components (relays) are conservatively mapped based on their effect on the function. (Notes 5 and 6)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.3.5.D	Two channels per bus for the 6.9 kV bus loss of voltage function inoperable	Two (per bus) 6.9 kV Class 1E bus undervoltage channels	Yes	Diesel Generator Start Instrumentation - Loss of Power	Two of Two undervoltage channels on each 6.9 kV Class 1E bus	Same	Mapped to modeled components. (Notes 5 and 6)
3.3.5.E	Two channels per bus for one or more degraded voltage or low grid undervoltage functions inoperable	Two (per bus) 6.9 kV Class 1E Degraded voltage channels Two (per bus) 480 V Class 1E bus degraded voltage channels Two (per bus) 480 V Class 1E bus low grid undervoltage	Yes	Diesel Generator Start Instrumentation - Loss of Power	Two of Two degraded voltage channels on each 6.9 kV Class 1E bus Two of Two degraded voltage channels on each 480 V Class 1E bus Two of Two low grid undervoltage channels on each 480 V Class 1E bus	Same	Surrogates used for certain components (relays) are conservatively mapped based on their effect on the function. (Notes 5 and 6)
3.3.5.F	One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	Two Automatic Actuation Logic and Actuation Relays trains	Yes	Diesel Generator Start Instrumentation - Loss of Power	One of Two Automatic Actuation Logic and Actuation Relays trains	Same	Surrogates used for certain components (relays) are conservatively mapped based on their effect on the function. (Notes 5 and 6)
3.4.9.B	One required group of pressurizer heaters inoperable.	Two groups of pressurizer heaters	No	RCS subcooling	One of two groups of pressurizer heaters with a capacity ≥ 150 kW	PRA does not model PRZ heaters.	Surrogates used for components are mapped based on their effect on the function. For the RICT, the impact has been mapped to an increase in the likelihood of a plant trip due to degraded pressure control. (Note 9)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.4.11.B	One PORV inoperable and not capable of being manually cycled.	Two PORVs	Yes	RCS depressurization for SGTR response Feed and bleed core cooling	One PORV OPERABLE One PORV with two CCPs OR Two PORVs with one CCP AND one SI pump.	Same	Mapped to modeled components.
3.4.11.C	One block valve inoperable.	Two PORV block valves	Yes	Isolate associated PORV Open to allow PORV functions in Function 3.4.11.B	One PORV and associated block valve OPERABLE One PORV and associated block valve with two CCPs OR Two PORVs and associated block valves with one CCP AND one SI pump	Same	Mapped to modeled components.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.5.2.A	One train inoperable because of the inoperability of a centrifugal charging pump.	Two centrifugal charging pumps	Yes	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).	1 of 2 centrifugal charging pumps.	Same	Mapped to modeled components. The centrifugal charging subsystem consists of two redundant, 100% capacity trains. (Note 8)

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.5.2.B	One or more trains inoperable for reasons other than one inoperable centrifugal charging pump.	Two ECCS trains consisting of, safety injection pump, RHR Pump, RHR heat exchangers	Yes	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).	One of two ECCS trains	Same	Mapped to modeled components. Surrogates used for certain components (pump/valves) are conservatively mapped based on their effect on the function TS 3.5.2 Condition B requires 100% flow equivalent to a single OPERABLE ECCS train is available. (Note 8)
3.6.2.C	One or more containment air locks inoperable for reasons other than Condition A or B.	Containment Airlocks	Not explicitly	Containment integrity	One of two containment air lock doors closed.	Same	Surrogates used for components are conservatively mapped based on their effect on the function. For RICT, the impact for this condition will be assumed that one end of the containment air lock has been verified to be able to perform its function 3.6.2.C.1. The components will therefore be mapped to a surrogate representing a loss of a single CIV for the 24 hour requirement. TS 3.6.2 Condition C Action 1 initiates action to evaluate overall containment leakage rate per LCO 3.6.1.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.6.3.A	One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.	Two active or passive isolation devices on each fluid penetration line	Yes	Containment boundary and minimization of RCS inventory loss	One of two isolation devices per penetration	Same	Mapped to modeled components. Surrogates used for certain components (CIV not explicitly modeled) are conservatively mapped based on their effect on the function.
3.6.3.C	One or more penetration flow paths with one containment isolation valve inoperable.	See LCO Condition 3.6.3.A					
3.6.6.A	One containment spray train inoperable.	Two Containment Spray System trains	Yes	Containment atmosphere cooling	One of two trains	Same	Mapped to modeled components. Surrogates used for certain components (breakers/valves) are conservatively mapped based on their effect on the function The Containment Spray System for each unit consists of two separate and completely redundant safety trains.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.7.2.A	One MSIV inoperable in Mode 1	Main Steam Isolation Valves (MSIVs)	Yes	Isolate Main Steam Lines	One MSIV closure per steam generator	Same	Mapped to modeled components. The design of the secondary system precludes the uncontrolled blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand.)
3.7.4.A	One required ARV line inoperable	Steam Generator Atmospheric Relief Valves (ARVs)	Yes	Pressure relief and plant cooldown	Two of four SG ARVs	One of four for Transient / SGTR	Mapped to modeled components. (Note 7)
3.7.4.B	Two required ARV lines inoperable.	Steam Generator Atmospheric Relief Valves (ARVs)	Yes	Pressure relief and plant cooldown	Two of four SG ARVs	One of four for Transient / SGTR	Mapped to modeled components. (Note 7)
3.7.4.C	Three or more required ARV lines inoperable.	Steam Generator Atmospheric Relief Valves (ARVs)	Yes	Pressure relief and plant cooldown	One of four SG ARVs and CST cooling water supply	One of four for Transient / SGTR	Mapped to modeled components. (Note 7)
3.7.5.A	One steam supply to the turbine driven AFW pump inoperable	Turbine driven AFW steam supply line valves and flowpath	Yes	Supply steam to turbine driven AFW pump	One of two steam feed lines	Same	Mapped to modeled components. Surrogates used for certain components (CIV valves) are conservatively mapped based on their effect on the function.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.7.5.B	One AFW train inoperable for reasons other than Condition A	Three AFW trains (two motor driven pumps and flowpath, one turbine driven pump and flowpath)	Yes	Supply feedwater to steam generators to remove RCS decay heat	One of three AFW trains supplying two SGs	All transients: One of three AFW pumps supplying 1 SG All LOCAs: :One of three AFW pumps supplying 2 SGs SGTR: :One of three AFW pumps supplying 1 SG	Mapped to modeled components. Surrogates used for certain components (CIV valves) are conservatively mapped based on their effect on the function.
3.7.7.A	One CCW train inoperable.	Two CCW trains comprised of a full capacity pump, heat exchanger, piping, valves, and instrumentation	Yes	Heat sink for removing process and operating heat from safety related components	One of two CCW trains	Same	Mapped to modeled components.
3.7.8.A	Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	Two 100% capacity SSW cooling water pumps and associated cross connects on opposite unit	Yes	Heat sink for removal of process and operating heat from safety related components during DBA or transient	One of two opposite unit SSW trains with cross-ties open.	Same	Mapped to modeled components
3.7.8.B	One SSWS train inoperable.	Two 100% capacity SSWS cooling water trains	Yes	Heat sink for removal of process and operating heat from safety related components during DBA or transient	One of two unit SSWS trains	Same	Mapped to modeled components.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.7.19.A	One safety chilled water train inoperable.	Two safety chilled water	Yes	Provide water to emergency fan coil units (EFCUs) to maintain ambient air temperature within design limits of the essential equipment in ESF pump rooms	One of two safety chilled water trains	Same	Mapped to modeled components. The Safety Chilled Water System for each unit consists of two separate and completely redundant safety trains.
3.8.1.A	One required offsite circuit inoperable.	Two trains with two qualified circuits between the offsite transmission network and the onsite 1E AC Electrical Power Distribution System.	Yes	Provide power from offsite transmission network to onsite Class 1E buses.	One qualified circuit between the offsite transmission network and the onsite 1E AC Electrical Power Distribution System.	Same	Mapped to modeled components.
3.8.1.B	One DG inoperable.	Two independent DGs per train capable of supplying onsite 1E AC Electrical Power Distribution System	Yes	Provide power to safety related buses when offsite power to them is lost.	1 of 2 DGs per unit	Same	Mapped to modeled components.
3.8.1.C	Two required offsite circuits inoperable.	Two trains with two qualified circuits between the offsite transmission network and the onsite 1E AC Electrical Power Distribution System.	Yes	Provide power from offsite transmission network to onsite Class 1E buses.	1 of 2 DGs per unit when offsite power is unavailable.	Same	Mapped to modeled components.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.8.1.D	One required offsite circuit inoperable. AND One DG inoperable.	Two trains with two qualified circuits between the offsite transmission network and the onsite 1E AC Electrical Power Distribution System and Two independent DGs per train capable of supplying onsite 1E AC Electrical Power Distribution System	Yes	Provide power from offsite transmission network to onsite Class 1E buses.	One qualified circuit between the offsite transmission network and the onsite 1E AC Electrical Power Distribution System if offsite power available. One DG per unit if offsite power unavailable.	Same	Mapped to modeled components.
3.8.1.F	One SI sequencer inoperable.	See LCO Condition 3.8.1.B					
3.8.4.A	One or two required battery chargers on one train inoperable.	Two 100% capacity chargers per battery	Yes	Ensure availability of required DC power to shut down the reactor and maintain it in a safe condition	One 100% capacity battery for one of two DC trains	Same	Mapped to modeled components. Surrogates used for certain components (inverters) are conservatively mapped based on their effect on the function. (Note 10)
3.8.4.B	One or two batteries on one train inoperable.	Two batteries per train	Yes	Ensure availability of required DC power to shut down the reactor and maintain it in a safe condition	One battery available for one of two DC trains	Same	Mapped to modeled components. Surrogates used for certain components (inverters) are conservatively mapped based on their effect on the function.
3.8.4.C	One DC electrical power subsystem inoperable for reasons other than Condition A or B.	Two DC electrical power distribution subsystems	Yes	Ensure availability of required DC power to shut down the reactor and maintain it in a safe condition	One of Two DC trains	Same	Mapped to modeled components. Surrogates used for certain components (inverters) are conservatively mapped based on their effect on the function.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

Tech Spec	Tech Spec Description	SSCs Covered by TS LCO Condition	Modeled in PRA?	Function Covered by TS LCO Condition	Design Success Criteria	PRA Success Criteria	Comments
3.8.7.A	One required inverter inoperable.	Four inverters per train.	Yes	Provide AC power to vital buses	One of two inverters supplying AC vital bus electrical power distribution system.	Same	Mapped to modeled components. Surrogates used for certain components (INSTR Panel) are conservatively mapped based on their effect on the function.
3.8.9.A	One AC electrical power distribution subsystem inoperable.	Two AC electrical power distribution subsystems	Yes	Provide power to safety related equipment.	One of two AC electrical power distribution subsystems	Same	Mapped to modeled components.
3.8.9.B	One AC vital bus subsystem inoperable.	Two AC vital bus subsystems	Yes	Provide power to safety related equipment.	One of two AC vital bus distribution subsystems	Same	Mapped to modeled components. Surrogates used for certain components (INSTR Panel) are conservatively mapped based on their effect on the function.
3.8.9.C	One DC electrical power distribution subsystem inoperable.	Two DC electrical power distribution subsystems	Yes	Ensure availability of required DC power to shut down the reactor and maintain it in a safe condition	One of two DC power distribution subsystems	Same	Mapped to modeled components.

Notes:

1. The Reactor Trip System instrumentation is segmented into four distinct but interconnected modules: field transmitters and process sensors, Signal Process Control and Protection System, Solid State Protection System (SSPS), and reactor trip switchgear. Field transmitters provide measurement of the unit parameters to the Signal Process Control and Protection System via separate, redundant channels. The Signal Process Control and Protection System forwards outputs to the SSPS, which consists of two redundant trains, to indicate a reactor trip or actuate Engineering Safety Functions.

2. Depending on the measured parameter, three or four instrumentation channels are provided to ensure protective action when required and to prevent inadvertent isolation resulting from instrumentation malfunctions. The output trip signal of each instrumentation channel initiates a trip logic. Failure of any one trip logic does not result in an inadvertent trip. Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient.

3. A trip breaker train consists of all trip breakers associated with a single Reactor Trip System logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Consistent with the requirements in WCAP-15376-P-A to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a RTB train is inoperable for maintenance are included.

Table E1-1, In Scope TS/LCO Conditions to Corrsponding PRA Functions

4. Each RTB is equipped with a shunt trip device that is energized to trip the RTB open upon receipt of a manual reactor trip signal, thus providing a redundant and diverse trip mechanism. Two Manual Reactor Trip channels provide the signal from reactor trip switches located in the Main Control Room to the RTBs.

5. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

6. For each unit, the undervoltage protection system, leading to the start of the diesel generators (DG) on loss of offsite power (LOOP), consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed. A NOTE will be added to LCO 3.3.5 limits the use of the RICT for Conditions B, C, D, or E to only one of these Conditions at any one time.

7. The unit can be cooled to residual heat removal (RHR) entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST.

8. The ECCS consists of three separate subsystems: centrifugal charging (high head), safety injection (intermediate head), and residual heat removal (low head). 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 accident consequences.

9. The unavailability of one required group of pressurizer heaters would not have any significant impact on plant transient response so there is no quantifiable impact to CDF or LERF. While mitigation of a SGTR is enhanced by the availability of pressurizer heaters, ECA-3.3A/B provides for mitigation of a SGTR without pressurizer heaters, if necessary.

   Degraded pressurizer heater capability is supplemented by the availability of the remaining heaters for plant pressure control, and the availability of plant procedures which provide plant shutdown and cooldown guidance with pressurizer heaters. If the available heaters are sufficient to maintain RCS pressure control, normal plant operations can continue. For the RICT, the impact has been mapped to an increase in the likelihood of a plant trip (factor of 10) due to degraded pressure control.

10. With both chargers inoperable on a single train of DC power the battery becomes the source of DC power until at least one changer can be restored to OPERABLE status. TS 3.8.4 also provides that the opposite train will provide the safety function.

11. The turbine stop valve trip is a backup for the turbine low oil pressure trip. The stop valve trip is not required to operate in the presence of a single or more channel failure. With a loss of load, the Pressurizer Pressure High trip and the Pressurizer safety valves protect the core and RCS integrity.

Table E1-2, In Scope TS/LCO Conditions RICT Estimate

Tech Spec	LCO Condition	RICT Estimate[1,2,3]
3.3.1.B	One Manual Reactor Trip channel inoperable.	30 days
3.3.1.D	One Power Range Neutron Flux-High channel inoperable.	30 days
3.3.1.E	One channel inoperable	30 days
3.3.1.M	One channel inoperable.	30 days
3.3.1.O	One Low Fluid Oil Pressure Turbine Trip channel inoperable.	30 days
3.3.1.P	One Turbine Trip channel inoperable.	30 days
3.3.1.R	One or more Turbine Stop Valve Closure Turbine Trip channel(s) inoperable.	30 days
3.3 1 S	One RTB train inoperable.	30 days
3.3.1.V	One trip mechanism inoperable for one RTB.	30 days
3.3.2.B	One channel or train inoperable.	30 days
3.3.2.C	One train inoperable.	30 days
3.3.2.D	One channel inoperable.	30 days
3.3.2.F	One channel or train inoperable.	30 days
3.3.2.G	One train inoperable.	30 days
3.3.2.H	One train inoperable.	30 days
3.3.2.I	One channel inoperable.	30 days
3.3.2.J	One Main Feedwater Pumps trip channel inoperable.	30 days
3.3.5.A	One or more Functions with one channel per bus inoperable.	30 days
3.3.5.B	Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	30 days
3.3.5.C	Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	30 days
3.3.5.D	Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	30 days
3.3.5.E	Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable.	30 days
3.3.5.F	One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	30 days
3.4.9.B	One required group of pressurizer heaters inoperable.	30 days
3.4.11.B	One PORV inoperable and not capable of being manually cycled.	30 days
3.4.11.C	One block valve inoperable.	26.7 days
3.5.2.A	One train inoperable because of the inoperability of a centrifugal charging pump.	30 days
3.5.2.B	One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	30 days
3.6.2.C	One or more containment air locks inoperable for reasons other than Condition A or B.	30 days
3.6.3.A	One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.	30 days
3.6.3.C	One or more penetration flow paths with one containment isolation valve inoperable except for containment purge, hydrogen purge or containment pressure relief valve leakage not within limit.	30 days

Table E1-2, In Scope TS/LCO Conditions RICT Estimate

Tech Spec	LCO Condition	RICT Estimate[1,2,3]
3.6.6.A	One containment spray train inoperable.	30 days
3.7.2.A	One MSIV inoperable in MODE 1.	30 days
3.7.4.A	One required ARV line inoperable	30 days
3.7.4.B	Two required ARV lines inoperable.	30 days
3.7.4.C	Three or more required ARV lines inoperable.	30 days
3.7.5.A	One steam supply to turbine driven AFW pump inoperable.	30 days
3.7.5.B	One AFW train inoperable for reasons other than Condition A.	30 days
3.7.7.A	One CCW train inoperable.	27.5 days
3.7.8.A	Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	30 days
3.7.8.B	One SSWS train inoperable.	12.2 days
3.7.19.A	One safety chilled water train inoperable.	24.8 days
3.8.1.A	One required offsite circuit inoperable.	30 days
3.8.1.B	One DG inoperable.	30 days
3.8.1.C	Two required offsite circuits inoperable.	29.9 days
3.8.1.D	One required offsite circuit inoperable. AND One DG inoperable.	28.1 days
3.8.1.F	One SI sequencer inoperable.	30 days
3. 8.4.A	One or two required battery chargers on one train inoperable.	13.4 days
3. 8.4.B	One or two batteries on one train inoperable.	28 days
3. 8.4.C	One DC electrical power subsystem inoperable for reasons other than Condition A or B.	30 days
3. 8.7.A	One required inverter inoperable.	30 days
3. 8. 9.A	One AC electrical power distribution subsystem inoperable.	30.6 hours
3.8.9.B	One AC vital bus subsystem inoperable.	19 hours
3.8.9.C	One DC electrical power distribution subsystem inoperable.	86 hours

Notes:

1. The actual RICT values will be calculated using the existing plant configuration and the current revision of the PRA model representing the as-built, as-operated condition of the plant, as required by NEI 06-09-A, Revision 0-A and the NRC safety evaluation, and may differ from the pre-calculated RICT values presented here.

2. RICTs are based on the internal events, internal flood, and internal fire PRA model calculations with seismic and high winds CDF and LERF penalties. RICTs calculated to be greater than 30 days are capped at 30 days based on NEI 06-09-A, Revision 0-A. RICTs not capped at 30 days are rounded to nearest number of hours.

3. Per NEI 06-09-A, Revision 0-A, for cases where the total CDF or LERF is greater than 1E-03/yr or 1E-04/yr, respectively, the RICT Program will not be entered.

Table E1-2, In Scope TS/LCO Conditions RICT Estimate

2.0 References

1. Letter from Jennifer M. Golder (NRC) to Biff Bradley (NEI), "Final Safety Evaluation for Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09-A, 'Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines,'" dated May 17, 2007 (ADAMS Accession No. ML071200238)

2. Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0-A, dated October 12, 2012 (ADAMS Accession No. ML 12286A322)

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
One Power Range Neutron Flux - High channel inoperable.	3.3.1.D.1.2	3.3.1.D.2.1	Licensee must justify that the condition does not represent the inability to perform the safety function assumed in the FSAR given the loss of spacial distribution of the remaining Power Range detectors. The justification can include that the Actions require periodic monitoring of spacial power distribution and imposition of compensatory limits and reduced power.	Notes 1 and 2
One RTB train inoperable.	3.3.1.S.1	3.3.1.U.1	The licensee must include information regarding how the TSTF-411 conditions and limitations will be implemented (or similar conditions if TSTF-411 has not been adopted), including discussion of ATWS Mitigation System Actuation (AMSAC), and why those actions are sufficient, including a discussion of defense in depth.	Note 3
Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	3.3.5.B.1	3.3.5.B.1	Licensee must justify that two or more channels per bus inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable. [See attached Safeguards UV Operation diagram, Figure E1.1]	Notes 4 and 5

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	3.3.5.C.1	3.3.5.B.1	Licensee must justify that two or more channels per bus inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable. [See attached Safeguards UV Operation diagram, Figure E1.1]	Notes 4 and 5
Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	3.3.5.D.1	3.3.5.B.1	Licensee must justify that two or more channels per bus inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable. [See attached Safeguards UV Operation diagram, Figure E1.1]	Notes 4 and 5
Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	3.3.5.E.1	3.3.5.B.1	Licensee must justify that two or more channels per bus inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable. [See attached Safeguards UV Operation diagram, Figure E1.1]	Notes 4 and 5

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	3.3.5.F.1	3.3.5.B.1	Licensee must justify that one or more channels per bus inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable.	Notes 4 and 5
One required group of pressurizer heaters inoperable.	3.4.9.B.1	3.4.9.B.1	Pressurizer is typically not modeled in the PRA. Licensee must justify the ability to calculate a RICT for the condition, including how the system is modeled in the PRA, whether all functions of the system are modeled, and, if a surrogate is used, why that modeling is conservative.	Note 6

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	3.5.2.B	3.5.2.A	Licensee must justify that one or more ECCS trains inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable. Acceptable justification is TS Condition requiring 100% flow equivalent to a single ECCS train.	The Condition acknowledges that individual component failures could affect both trains but 100% flow equivalent to that of a single train is still required.
One or more containment air locks inoperable for reasons other than Condition A or B.	3.6.2.C.3	3.6.2.C.3	Licensee must justify that an inoperable containment air lock is not a condition in which all required trains or subsystems of a TS required system are inoperable. An acceptable argument may be that a note in TS 3.6.2 requires the condition to be assessed in accordance with TS 3.6.1, Containment Integrity, and excessive leakage would require an immediate plant shutdown under that TS.	TS 3.6.2 Condition C Action C.1 initiates action to evaluate the overall containment leakage rate per LCO 3.6.1. While also verifying a door is closed in the affected air lock and restore the air lock to OPERABLE status in 24 hours. If air lock is not restored, be in MODE 3 in 6 hours and MODE 5 in 36 hours.

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
One containment spray train inoperable.	3.6.6.A.1	3.6.6A	Licensee must justify the ability to calculate a RICT for the condition, including how the system is modeled in the PRA, whether all functions of the system are modeled, and, if a surrogate is used, why that modeling is conservative. [See attached Containment Spray One-Line diagram, Figure E1.2]	Note 7
One MSIV inoperable in MODE 1.	3.7.2.A.1	3.7.2.A.1	Licensee must justify that the condition would not prevent performance of the steam line break isolation function assumed in the accident analysis. An acceptable method may be a second MSIV per steam line, another design feature, or an alternate method of preventing blowdown of more than one steam generator.	The design of the secondary system precludes the uncontrolled blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand.) This is accomplished by closing the other three MSIVs manually or automatically.
Two required ARV lines inoperable.	3.7.4.B.1	3.7.4.B.1	Licensee must justify that two or more inoperable ADVs is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable.	Note 8

Table E1-3, Conditions Requiring Additional Technical Justification

TSTF-505 Tech Spec Description	CPNPP TS	TSTF-505 TS	TSTF-505 Required Justification	Justification *
Three or more required ARV lines inoperable.	3.7.4.C.1	N/A	Licensee must justify that three or more inoperable ADVs is not a condition in which all required trains or subsystems of a TS required system are inoperable or modify the Action to not apply a RICT when all required trains or subsystems are inoperable.	Note 8
One SSWS train inoperable.	3.7.8.B.1	N/A	Licensee must justify that one SSWS train is not a condition in which all required trains or subsystems of a TS required system are inoperable.	Note 9
One safety chilled water train inoperable.	3.7.19.A.1	N/A	Licensee must justify that one safety chilled water train inoperable is not a condition in which all required trains or subsystems of a TS required system are inoperable. [See attached Safety Chilled Water One-Line diagram, Figure E1.3]	The Safety Chilled Water System for each unit consists of two separate and completely redundant safety trains.

Notes:

* Justification for applying the RICT to any Completion Time must recognize a key fundamental for Technical Specification use. Once in a Condition with Required Actions no additional failures are considered. So, when applying the RICT Completion Time extensions, CPNPP will evaluate if the risk to be in the Condition for the extended time is acceptable.

1. The Reactor Trip System (RTS) instrumentation is segmented into four distinct but interconnected modules: field transmitters and process sensors, Signal Process Control and Protection System, Solid State Protection System (SSPS), and reactor trip switchgear. Field transmitters provide measurement of the unit parameters to the Signal Process Control and Protection System via separate, redundant channels. The Signal Process Control and Protection System forwards outputs to the SSPS,

Table E1-3, Conditions Requiring Additional Technical Justification

which consists of two redundant trains, to actuate a Reactor Trip or an Engineered Safety Feature (ESF). This redundancy maintains safety function.

2. Depending on the measured parameter, three or four instrumentation channels are provided to ensure protective action when required and to prevent inadvertent isolation resulting from instrumentation malfunctions. The output trip signal of each instrumentation channel initiates a trip logic. Failure of any one trip logic does not result in an inadvertent trip. Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient. In both cases, a single failure will neither cause nor prevent the protective safety function actuation. With a failed power range instrument and rated thermal power greater than 75% the Quadrant Power Tilt Ratio must be verified 12 hours after the channel became inoperable and then every 12 hours until the channel is restored to OPERABLE status.

3. A trip breaker train consists of all trip breakers associated with a single Reactor Trip System logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Consistent with the requirement in WCAP-15376-P-A to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when an RTB train is inoperable for maintenance are included. Multiple SSPS outputs provide trip signals to the trip logic which in turn opens the trip breakers. Additionally, CPNPP has ATWS Mitigation System Actuation Circuitry (AMSAC). At CPNPP the ATWS is referred to as the Anticipated Transient Without Trip (ATWT). AMSAC is independent of SSPS. AMSAC actuation will occur if turbine load is greater than 40% and three of four Steam Generator (SG) narrow range levels are less than 10%. There is a built in time delay to allow SSPS time to actuate. The AMSAC output will trip the main turbine, start all Auxiliary Feedwater (AFW) pumps, isolate SG blowdown and sample lines, and close the Condensate Storage Tank (CST) discharge valves. Due to a different main feedwater design on Unit 2, AMSAC also close the Feedwater Split-flow Bypass Valves (FSBVs). The system design is to provide AFW flow to the SGs and conserve feedwater while responding to an ATWT.

   CPNPP adopted TSTF-411 with License Amendment 114 (ML050460331). It can be seen that the CPNPP SSPS which provides protection through actuation of required reactor trips and engineered safety features and the adoption the AMSAC system described above, there is defense-in-depth should the reactor not trip. AMSAC actuation is delayed allowing SSPS the opportunity to trip the reactor and actuate ESF components. If SSPS fails to perform its safety function, AMSAC will actuate to preserve a heat sink, preventing core damage. A manual reactor trip from two different handswitches and a manual turbine trip in the Control Room are available, providing diversity and defense-in-depth.

4. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV

Table E1-3, Conditions Requiring Additional Technical Justification

Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses. For Conditions B, C, D, E, and F separate entries are allowed by TS 3.3.5. Currently each of these Conditions call for restoring one channel per bus to OPERABLE status within 1 hour. "Two channels per bus" is acceptable as each bus must have both channels to initiate the start signal for the DG in Conditions B, C, D, or E.

Condition F allows for 1 hour to restore Automatic Actuation Logic and Actuation Relays train(s) whether one or both trains are inoperable. One train is sufficient to start the train-related DG and satisfy the required functionality. If one or both Automatic Actuation Logic and Actuation Relays train(s) are inoperable, then the associated DG(s) are declared inoperable after 1 hour. If both buses are found to be inoperable per Conditions B, C, D, or E, then actions for the inoperable source or bus will be required. In applying the RICT, the 1 hour Completion Times may be extended based on plant configuration and acceptable risk. Failure to meet the Completion Time will cause entry into TS 3.8.1 for an inoperable Diesel Generator in accordance with TS 3.3.5, Condition G.

This TS LCO (3.3.5) will have a NOTE that states that the RICT may only be applied to one Condition from Conditions B, C, D or E at a time to maintain Function redundancy, independence, diversity, and defense-in-depth.

5. For each unit, the undervoltage protection system, leading to the start of the diesel generators (DG) on loss of offsite power (LOOP), consists of the following functional groups: Preferred offsite source undervoltage, alternate offsite source undervoltage, 6.9kV Class 1E buses loss of voltage, 480V Class 1E buses low grid undervoltage, 6.9kV Class 1E buses degraded voltage, and 480V Class 1E buses degraded voltage. Each of these groups consists of two sensing relays per bus that provide input to two-out-of-two logic. In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The start instrumentation requires that two channels per bus of the loss of voltage and degraded voltage Functions shall be operable. Two trains of Automatic Actuation Logic and Actuation Relays shall also be Operable. The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents in which a loss of offsite power is assumed.

6. Safety analyses do not take credit for pressurizer heaters. The initial assumption is that the RCS is at normal pressure. Any RICT application will evaluate the anticipated demand for more than one group of heaters. The current model of record does not explicitly model the pressurizer heater directly, instead, we use a surrogate to represent its function/impact in the RICT model. For the RICT, this is done by increasing the likelihood of a reactor trip by a factor of 10 (conservative modeling). The unavailability of one required group of pressurizer heaters would not have any significant impact on plant transient response so there is no quantifiable impact to CDF or LERF. While mitigation of a SGTR is enhanced by the availability of pressurizer heaters, ECA-3.3A/B, "SGTR without Pressurizer Pressure Control" provides for mitigation of a SGTR without pressurizer heaters, if necessary.

Table E1-3, Conditions Requiring Additional Technical Justification

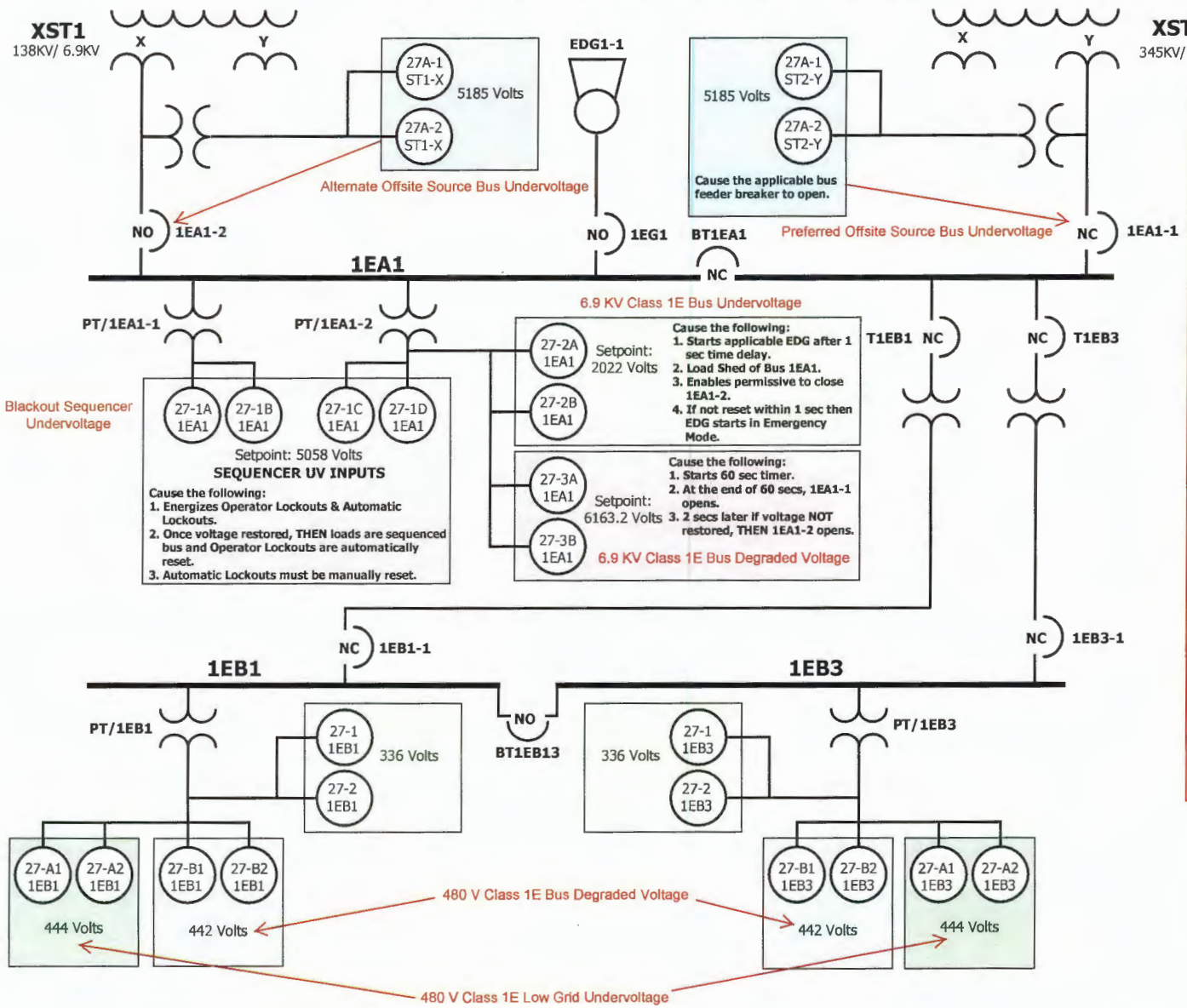
Degraded pressurizer heater capability is supplemented by the availability of the remaining heaters for plant pressure control, and the availability of plant procedures which provide plant shutdown and cooldown guidance with pressurizer heaters. If the available heaters are sufficient to maintain RCS pressure control, normal plant operations can continue. CPNPP design includes one control heater group and three backup heater groups. Only two groups of heaters are required with an output of 150 KW each.

7. The Containment Spray (CT) System for each unit consists of two separate and completely redundant safety trains. Each Containment Spray train has two pumps. The CPNPP model of record / RICT model requires two CT spray pumps per train to meet its success criteria (only one train is required to meet the PRA success criteria). As this is explicitly modeled, when either pump (in a train) is removed from service the function is failed for that train and the RICT will be calculated based on the new configuration.

8. The unit can be cooled to residual heat removal (RHR) entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST. Currently the Completion Time for one ARV inoperable is 7 days, for two ARVs inoperable is 72 hours, and for three or more ARVs inoperable is 24 hours.
   The design basis of the ARVs for the minimum relief capacity is established by the capability to cool the unit to RHR entry conditions and the capability to mitigate a SGTR, The design basis for the maximum relief capacity is established by the 10CFR100 limits for SGTR and the capacity of the MSSVs assumed in the accident analyses. The design cooldown rate of 50°F per hour is applicable for a natural circulation cooldown using two steam generators, each with one ARV. The unit can be cooled to RHR entry conditions with only one steam generator and one ARV, utilizing the cooling water supply available in the CST.

9. The SSWS consists of two separate, 100% capacity, safety related, cooling water trains. Each train consists of one 100% capacity pump, piping, valving, and instrumentation. The pumps and valves are remote and manually aligned to be operable in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to their respective loops are automatically started upon receipt of a safety injection signal. An automatic valve in the discharge of each pump is interlocked to open on a pump start. An automatic valve in the SSWS cooling water flow path for each emergency diesel generator automatically opens on a diesel generator start. All other valves are manual valves operated locally. The SSWS also is the backup water supply to the Auxiliary Feedwater System.
   Cross-connections are provided between trains and between units such that any pump can supply any other pump's required flow.

SAFEGUARDS UNDERVOLTAGE OPERATION OVERVIEW



Notes:

1. 1EA1-1 and 1EA1-2 open automatically under the following conditions:
   A. An 86-1 or 86-2 lockout of their respective transformer occurs.
   B. An 86-1 or 86-2 lockout on 6.9KV Bus 1EA1 occurs.
   C. An undervoltage condition occurs as sensed by the applicable undervoltage relays. (see notes next to the relays)

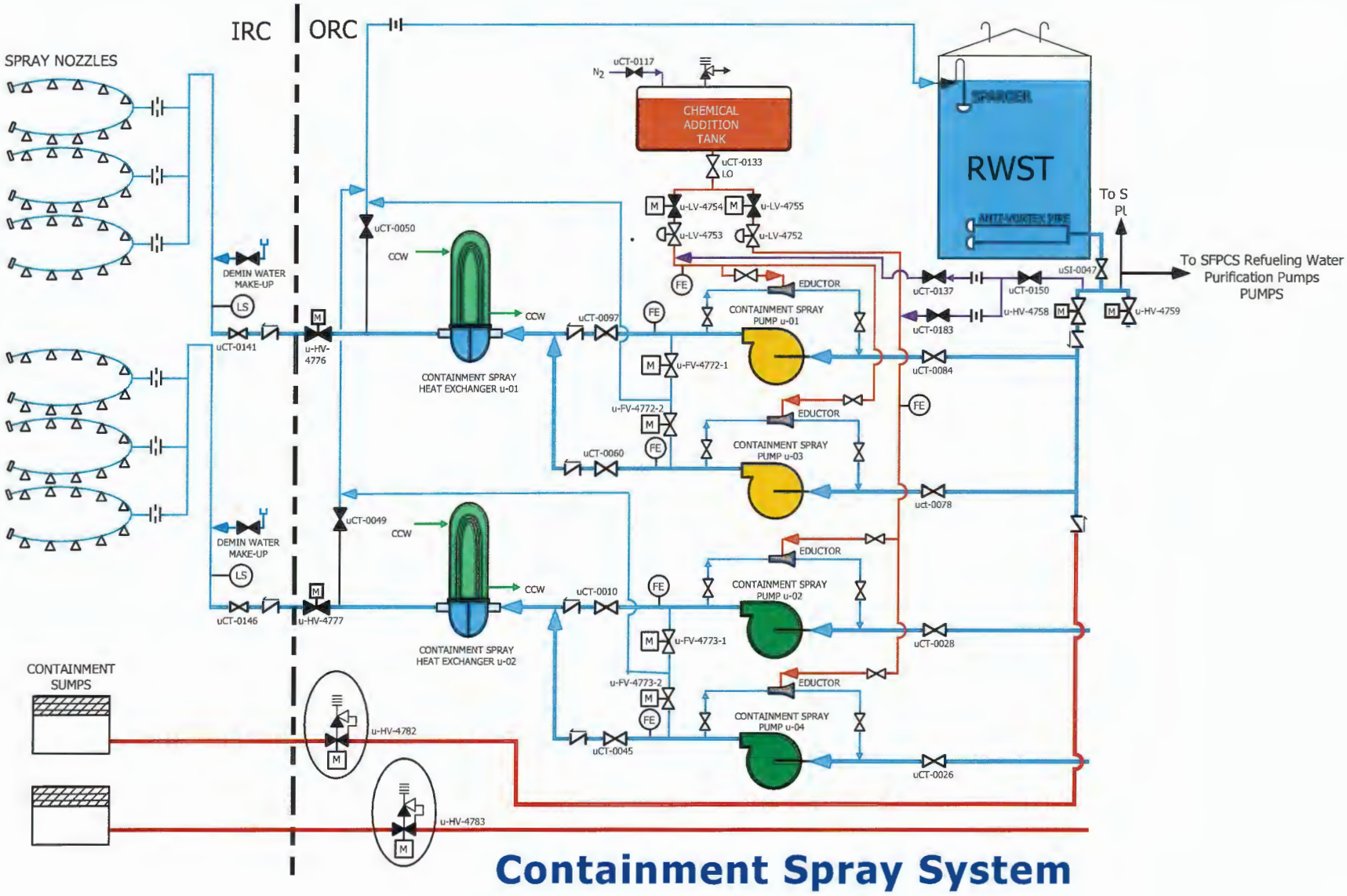
2. 1EG1 will close in **AUTO** under the following conditions:
   A. The EDG is at operating Frequency and Voltage.
   B. Both 1EA1-1 and 1EA1-2 are open.
   C. If either Bus 1EA1 and/or the EDG have a 86-2 lockout, THEN the diesel MUST have started due to either a Safety Injection or Blackout (Emergency Start).

3. If an 86-1 lockout occurs on Bus 1EA1, then all feeder breakers will open and cannot be reclosed until the condition has been reset.

4. If an 86-1 lockout occurs on EDG1-1, then 1EG1 will open and cannot be reclosed until the condition has been reset. If an 86-2 lockout occurs 1EG1 can be closed as long as as the EDG started because of an SI or Blackout (Emergency Start).

5. The following outlines the normal sequence of events that should occur on a loss of the normal feeder to the bus.
   A. 1EA1-1 opens either due to low voltage or an 86 lockout of XST1.
   B. As voltage degrades the Blackout Sequencer will energize all OL and AL contacts.
   C. Once 2022 volts is reached (a)1EA1 load shed occurs, (b) the close permissive for 1EA1-2 is enabled (breaker should close) and (c) the EDG gets an emergency start signal AFTER a 1 sec time delay.
   D. Normally 1EA1-2 should close and re-energize the bus before the EDG ever starts. However if the bus is not re-energized in 1 sec the EDG will start and come up to rated voltage and frequency within 10 secs.
   E. Once voltage drops below 6163.2 volts and 1EA1-1 is open then voltage must be above the reset voltage within 2 secs or 1EA1-2 will open or if already closed it will be tripped open.
   F. In the event 1EA1-2 does not restore voltage then the 1EG1 will close as long as its permissives are met (see note 2 above).
   G. Once voltage is restored the BOS will then sequence on all loads onto the bus.

Figure E1.1



Containment Spray System

Figure E1.2

Safety Chilled Water System

Figure E1.3

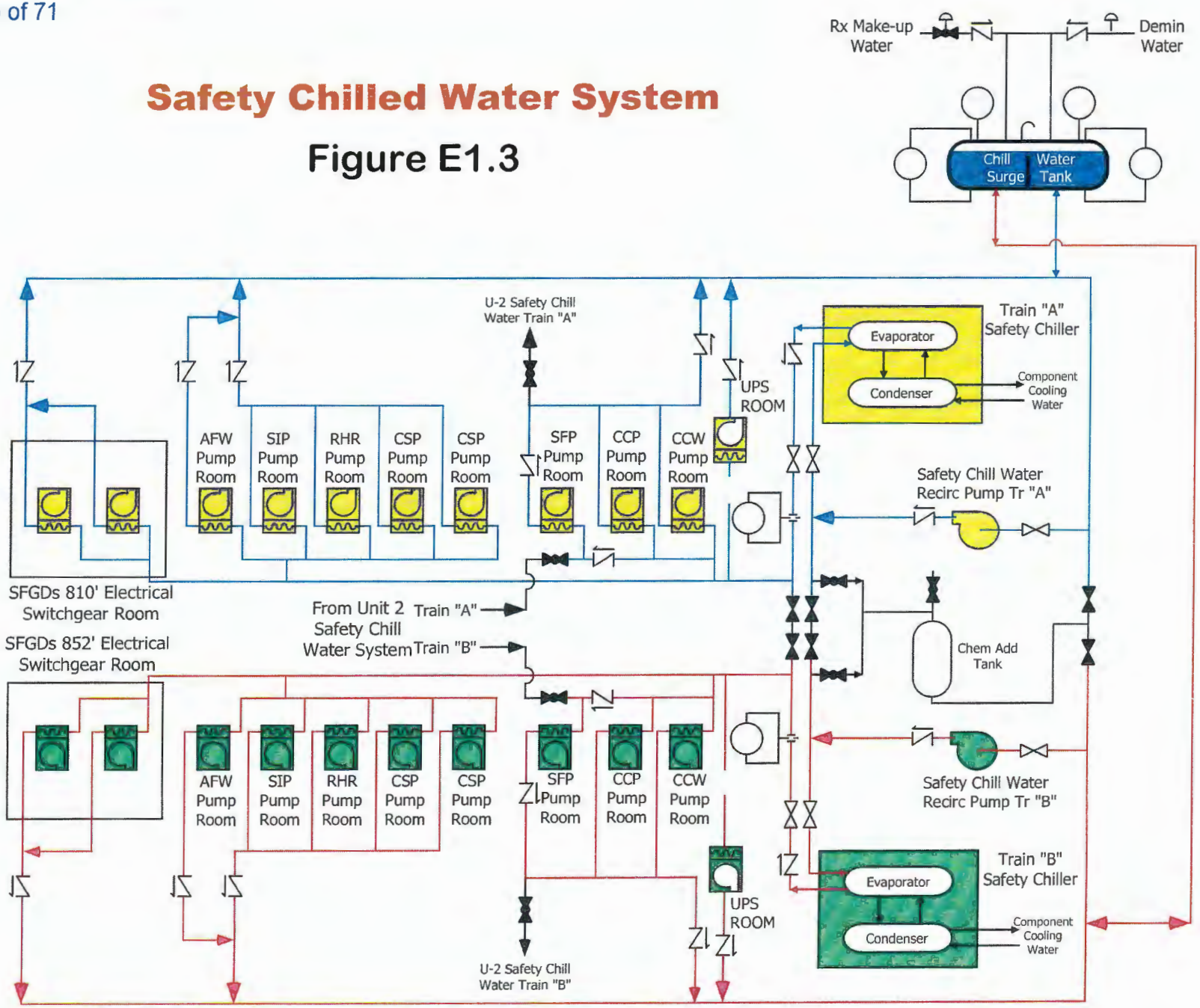


Table E1-4, Evaluation of Instrument and Control Systems

Accident		RTS Function	ESFAS Function	LOP DG Start Function	Equipment	ESF Equipment
15.1	INCREASE IN HEAT REMOVED BY THE SECONDARY SYSTEM					
	Feedwater system malfunctions that result in a decrease in feedwater temperature	• Overpower N-16 • Power range high flux • Overtemperature N-16 • Manual				
	Feedwater system malfunctions that result in an increase in feedwater flow	• Power range high flux • High SG level • Manual	• High SG level (P-14) produced FWI & Turbine Trip		• FWIVs	
	Excessive increase in secondary steam flow	• Power range high flux • Overtemperature N-16 • Overpower N-16 • Manual			• PRZR Safety Valves • MSSVs	
	Inadvertent opening of a steam generator relief or safety valve	• Low PRZR Press • Manual • SI signal	• Low PRZR Press • Low MSL Press • Manual		• FWIVs • MSIVs	• AFW System • SI System
	Steam system piping failure	• SI signal • Low PRZR Press • Manual	• Low PRZR Press • Low MSL Press • CNTMT Press High 1 • Manual	(Note 1)	• FWIVs • MSIVs	• AFW System • SI System

Table E1-4, Evaluation of Instrument and Control Systems

Accident		RTS Function	ESFAS Function	LOP DG Start Function	Equipment	ESF Equipment
15.2	DECREASE IN HEAT REMOVAL BY THE SECONDARY SYSTEM					
	Loss of external electrical load / turbine trip	• High PRZR Press • Overtemperature N-16 • Manual			• PRZR Safety Valves • MSSVs	
	Loss of non-emergency AC power to the station auxiliaries	• Low-Low SG level • Manual	• Low-Low SG level (AFW Initiation)	Note 2	• MSSVs	• AFW System
	Loss of normal feedwater flow	• Low-Low SG level • Manual	• Low-Low SG level		• MSSVs	• AFW System
	Feedwater system pipe break	• Low-Low SG level • High PRZR Press • SI signal • Manual	• CNTMT Press High 1 • Low-Low SG level • Low MSL Press	Note 1	• MSIVs • Feedline isolation • PRZR Safety Valves • MSSVs	• AFW System • SI System
15.3	DECREASE IN REACTOR COOLANT SYSTEM FLOW RATE					
	Partial and complete loss of forced reactor coolant flow	• RCS low flow • RCP undervoltage • RCP underfrequency • Manual			• MSSVs	
	Reactor coolant pump shaft seizure (locked rotor)	• RCS low flow • Manual			• PRZR Safety Valves • MSSVs	

Table E1-4, Evaluation of Instrument and Control Systems

Accident		RTS Function	ESFAS Function	LOP DG Start Function	Equipment	ESF Equipment
15.4	REACTIVITY AND POWER DISTRIBUTION ANOMALIES					
	Uncontrolled rod cluster control assembly bank withdrawal from a subcritical or low power startup condition	• Power range high flux (Low setpoint) • Manual				
	Uncontrolled rod cluster control assembly bank withdrawal at power	• Power range high flux • Power range high flux rate • Overtemperature N-16 • Overpower N-16 • High PRZR Press • Manual			• PRZR Safety Valves • MSSVs	
	Rod cluster control assembly misalignment	• Low PRZR Press • Overtemperature N-16 • Manual				
	Chemical and Volume Control System malfunction that results in a decrease in boron concentration in the reactor coolant	• Source range high flux • Power range high flux • Power range high flux (Low setpoint) • Overtemperature N-16 • Manual			• Rod insertion limit alarms • VCT high level • CVCS/RMWS alarms	
	Spectrum of rod cluster control assembly ejection accidents	• Power range high flux • Power range high flux (Low setpoint) • Power range high flux rate • Manual				

Table E1-4, Evaluation of Instrument and Control Systems

Accident		RTS Function	ESFAS Function	LOP DG Start Function	Equipment	ESF Equipment
15.5	INCREASE IN REACTOR COOLANT INVENTORY					
	Inadvertent operation of the ECCS during power operation	• Low PRZR Press • Manual • SI signal				• SI System
15.6	DECREASE IN REACTOR COOLANT INVENTORY					
	Inadvertent opening of a pressurizer safety or relief valve	• Low PRZR Press • Overtemperature N-16 • Manual				
	Steam generator tube failure	• Low PRZR Press • Overtemperature N-16 • Manual	• Low PRZR Press • Manual	Note 1	• SSW System • CCW System • MSSVs / ARVs • MSIVs • PORVs	• ECCS • AFW System • MSSVs / ARVs • Emergency Power
	Loss of coolant accidents resulting from the spectrum of postulated piping breaks within the reactor coolant pressure boundary	• RTS	• ESFAS	Note 1	• SSW System • CCW System • MSSVs / ARVs	• ECCS • AFW System • CNTMT Spray • Emergency Power

Notes

1. The emergency Diesel Generators (DG) have two automatic starts outside of the starts provided in TS LCO 3.3.5, LOP DG Start Instrumentation; Blackout (undervoltage) and Safety Injection (SI). If the SI is the event initiator the SI starts the DG. If a loss of all offsite power (LOOP) is the event initiator the Blackout will start the DG. The starts provided in LCO 3.3.5 are anticipatory to a loss of offsite power. Separate relays provide the starts form LCO 3.3.5 Functions.

Table E1-4, Evaluation of Instrument and Control Systems

2. A loss of non-emergency offsite power will likely be accompanied by a loss of safety related offsite power. If that is so the Blackout (undervoltage) will start the DGs. If the Blackout start malfunctions, then any of the LCO 3.3.5 will start the DGs due to degraded voltage or undervoltage.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
1	Manual Reactor Trip (Two handswitches)	1/2	The Manual Reactor Trip ensures that the control room operator can initiate a reactor trip at any time by using either of two reactor trip switches in the control room. A Manual Reactor Trip accomplishes the same results as any one of the automatic trip Functions.
2.a	Power Range Neutron Flux High setpoint	2/4	The Power Range Neutron Flux-High trip Function ensures that protection is provided, from all power levels, against a positive reactivity excursion leading to DNB during power operations. These can be caused by rod withdrawal or reductions in RCS temperature.
2.b	Power Range Neutron Flux Low setpoint	2/4	[Required below P-10] The LCO requirement for the Power Range Neutron Flux-Low trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.
3	Power Range Neutron Flux Rate High (Positive Rate)	2/4	The Power Range Neutron Flux-High Positive Rate trip Function ensures that protection is provided against rapid increases in neutron flux that are characteristic of an RCCA drive rod housing rupture and the accompanying ejection of the RCCA or an uncontrolled RCCA bank withdrawal during power operation. **This Function complements the Power Range Neutron Flux-High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection from the power range or an uncontrolled RCCA bank withdrawal during power operation.**

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
4	Intermediate Range Neutron Flux	1/2	[Required above P-6 and below P-10] The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. **This trip Function provides redundant protection to the Power Range Neutron Flux-Low Setpoint trip Function.**
5	Source Range Neutron Flux	1/2	[Required below P-6] The LCO requirement for the Source Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. **This trip Function provides redundant protection to the Power Range Neutron Flux-Low and Intermediate Range Neutron Flux trip Functions**.
6	Overtemperature N-16	2/4	The Overtemperature N-16 trip Function is provided to ensure that the design limit DNBR is met. The inputs to the Overtemperature N-16 trip include pressure, coolant temperature, axial power distribution, and reactor power as indicated by loop N-16 power monitors, assuming full reactor coolant flow.
7	Overpower N-16	2/4	The Overpower N-16 trip Function ensures that protection is provided to ensure the integrity of the fuel (i.e., no fuel pellet melting and less than 1% cladding strain) under all possible overpower conditions. **This trip Function also limits the required range of the Overtemperature N-16 trip Function and provides a backup to the Power Range Neutron Flux-High Setpoint trip.**

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
8.a	Pressurizer Pressure Low	2/4	[Required above P-7] The Pressurizer Pressure-Low trip Function ensures that protection is provided against violating the DNBR limit due to low pressure.
8.b	Pressurizer Pressure High	2/4	The Pressurizer Pressure-High trip Function ensures that protection is provided against overpressurizing the RCS. **This trip Function operates in conjunction with the pressurizer relief and safety valves to prevent RCS overpressure conditions.**
9	Pressurizer Water Level High	2/3	[Required above P-7] **The Pressurizer Water Level-High trip Function provides a backup signal for the Pressurizer Pressure-High trip and also provides protection against water relief through the pressurizer safety valves.** These valves are designed to pass steam in order to achieve their design energy removal rate.
10	Reactor Coolant Flow Low (1 of 4 loops)	2/3	[Required above P-8] The Reactor Coolant Flow-Low trip Function ensures that protection is provided against violating the DNBR limit due to low flow in **one** or more RCS loops, while avoiding reactor trips due to normal variations in loop flow.
10	Reactor Coolant Flow Low (2 of 4 loops)	2/3	[Required above P-7 and below P-8] The Reactor Coolant Flow-Low trip Function ensures that protection is provided against violating the DNBR limit due to low flow in **two** or more RCS loops, while avoiding reactor trips due to normal variations in loop flow.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
12	Undervoltage RCPs (1 per RCP)	2/4	[Required above P-7] The Undervoltage RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. **This trip Function will generate a reactor trip before the Reactor Coolant Flow-Low Trip Setpoint is reached.**
13	Underfrequency RCPs (1 per RCP)	2/4	[Required above P-7] The Underfrequency RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops from a major network frequency disturbance. An underfrequency condition will slow down the pumps, thereby reducing their coastdown time following a pump trip. An adequate coastdown time is required so that reactor heat can be removed immediately after reactor trip. **This trip Function will generate a reactor trip before the Reactor Coolant Flow-Low Trip Setpoint is reached.**
14	SG Water Level Low-Low (1 of 4 SGs)	2/4	The SG Water Level-Low Low trip Function ensures that protection is provided against a loss of heat sink and actuates the AFW System prior to uncovering the SG tubes.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
16.a	Turbine Trip - Low Fluid Oil Pressure	2/3	[Required above P-9] The Turbine Trip-Low Fluid Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-9 setpoint of 50% power will not actuate a reactor trip. Three pressure switches monitor the control oil pressure in the Turbine Electrohydraulic Control System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip.
16.b	Turbine Trip - Turbine Stop Valve Closure	4/4	[Required above P-9] The Turbine Trip-Turbine Stop Valve Closure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. The trip Function anticipates the loss of secondary heat removal capability that occurs when the stop valves close. **This trip Function will not and is not required to operate in the presence of a single channel failure. Core protection is provided by the Pressurizer Pressure-High trip Function, and RCS integrity is ensured by the pressurizer safety valves. This trip Function is diverse to the Turbine Trip-Low Fluid Oil Pressure trip Function.**
17	SI signal from ESFAS (2 trains)	1/2	The SI Input from ESFAS ensures that if a reactor trip has not already been generated by the RTS, the ESFAS automatic actuation logic will initiate a reactor trip upon any automatic signal that initiates SI.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
18	RTS Interlocks		Reactor protection interlocks are provided to ensure reactor trips are in the correct configuration for the current unit status. They back up operator actions to ensure protection system Functions are not bypassed during unit conditions under which the safety analysis assumes the Functions are not bypassed. Therefore, the interlock Functions do not need to be OPERABLE when the associated reactor trip functions are outside the applicable MODES.
18.a	P-6, Intermediate Range Neutron Flux	1/2	The Intermediate Range Neutron Flux, P-6 interlock is actuated when any NIS intermediate range channel goes approximately one decade above the minimum channel reading. If both channels drop below the setpoint, the permissive will automatically be defeated.
18.b	P-7, Low Power Reactor Trip Blocks	1/2	[Required when P-10 or P-13 ≤ 10%] The Low Power Reactor Trips Block, P-7 interlock is actuated by input from either the Power Range Neutron Flux, P-10, or the Turbine First Stage Pressure, P-13 interlock. Above P-7 the following reactor trips are enabled, below P-7 they are blocked automatically; • PRZR Pressure Low • PRZR Water Level High • RCS Flow Low • Undervoltage RCPs • Underfrequency RCPs

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
18.c	P-8, Power Range Neutron Flux	2/4	The Power Range Neutron Flux, P-8 interlock is actuated at approximately 48% power as determined by two-out-of-four NIS power range detectors. The P-8 interlock automatically enables the Reactor Coolant Flow-Low reactor trip on low flow in one or more RCS loops on increasing power. The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in the core when greater than 48% power.
18.d	P-9, Power Range Neutron Flux	2/4	The Power Range Neutron Flux, P-9 interlock is actuated at approximately 50% power as determined by two-out-of-four NIS power range detectors. The LCO requirement for this Function ensures that the Turbine Trip-Low Fluid Oil Pressure and Turbine Trip-Turbine Stop Valve Closure reactor trips are enabled above the P-9 setpoint. Above the P-9 setpoint, a turbine trip will cause a load rejection beyond the capacities of the Steam Dump and Rod Control Systems. A reactor trip is automatically initiated on a turbine trip when it is above the P-9 setpoint, to minimize the transient on the reactor.
18.e	P-10, Power Range Neutron Flux	2/4	The Power Range Neutron Flux, P-10 interlock is actuated at 10% power, as determined by two-out-of-four NIS power range detectors. If power level falls below 10% RTP on 3 of 4 channels, the nuclear instrument trips will be automatically unblocked.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
18.f	P-13, Turbine First Stage Pressure	1/2	The Turbine First Stage Pressure, P-13 interlock is actuated when the pressure in the first stage of the high pressure turbine is greater than approximately 10% of the full power pressure. The full power pressure corresponds to the first stage pressure at 100% RTP. The interlock is determined by one-out-of-two pressure detectors. The LCO requirement for this Function ensures that one of the inputs to the P-7 interlock is available.
19	Reactor Trip Breakers (RTB) (2 trains)	1/2	This trip Function applies to the RTBs exclusive of individual trip mechanisms. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of all trip breakers associated with a single RTS logic train that are racked in, closed, and capable of supplying power to the CRD System. Thus, the train may consist of the main breaker or the main breaker and bypass breaker, depending upon the system configuration. Two OPERABLE trains ensure no single random failure can disable the RTS trip capability.
20	RTB Undervoltage & Shunt Trip Mechanisms (1 per RTB)	1/2	The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each RTB that is in service. The trip mechanisms are not required to be OPERABLE for trip breakers that are open, racked out, incapable of supplying power to the Rod Control System or declared inoperable under Function 19. OPERABILITY of both trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal.

Table E1-5, Reactor Trip System (RTS) Instrumentation Functions

RTS Function		Degree of Redundancy-Coincidence	Notes
21	Automatic Trip Logic (2 trains)	1/2	**The LCO requirement for the RTBs (Functions 19 and 20) and Automatic Trip Logic (Function 21) ensures that means are provided to interrupt the power to allow the rods to fall into the reactor core.** Each RTB is equipped with an undervoltage coil and a shunt trip coil to trip the breaker open when needed. Each RTB is equipped with a bypass breaker to allow testing of the trip breaker while the unit is at power. The reactor trip signals generated by the RTS Automatic Trip Logic cause the RTBs and associated bypass breakers to open and shut down the reactor.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
1	Safety Injection		Provides two primary functions; 1. Remove heat via water addition; and 2. Add boron to recover and maintain core reactivity negative.
1.a	Manual (2 handswitches)	1/2	Each handswitch actuates both trains. Also initiates a manual reactor trip.
1.b	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.
1.c	Containment Pressure High 1	2/3	Provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with a two-out-of-three logic.
1.d	Pressurizer Pressure Low	2/4	Provides both control and protection functions: input to the Pressurizer Pressure Control System, reactor trip, and SI. May block below P-11
1.e	Steam Line Pressure Low (1 of 4 steam lines)	2/3	Provides no input to any control functions. Thus, three OPERABLE channels on each steam line are sufficient to satisfy the protective requirements with a two-out-of-three logic on each steam line. May block below P-11
2	Containment Spray		Provides three primary functions: 1. Lower CNTMT pressure & temperature; 2. Reduce CNTMT atmosphere iodine; and 3. Adjust pH of CNTMT sump water after LB LOCA

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
2.a	Manual (2/2 handswitches)	1/2 locations	The operator can initiate containment spray at any time from the control room by simultaneously turning two containment spray actuation switches in the same train. Because an inadvertent actuation of containment spray could have such serious consequences, two switches must be turned simultaneously to initiate containment spray. There are two sets of two switches each in the control room. Simultaneously turning the two switches in either set will actuate containment spray in both trains in the same manner as the automatic actuation signal.
2.b	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the CNTMT Spray equipment.
2.c	Containment Pressure High 3	2/4	This Function requires the bistable output to energize to perform its required action. It is not desirable to have a loss of power actuate containment spray, since the consequences of an inadvertent actuation of containment spray could be serious. Note that this Function also has the inoperable channel placed in bypass rather than trip to decrease the probability of an inadvertent actuation. Four channels are used in a two-out-of-four logic configuration.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
3	Containment Isolation		Containment Isolation provides isolation of the containment atmosphere, and all process systems that penetrate containment, from the environment. This Function is necessary to prevent or limit the release of radioactivity to the environment in the event of a LB LOCA.
3.a	Phase A Isolation		Phase A containment isolation is actuated automatically by SI, or manually via the automatic actuation logic. All process lines penetrating containment, with the exception of CCW (RCP Cooling), are isolated.
3.a.(1)	Manual (2 handswitches)	1/2 locations	Accomplished by either of two switches in the control room. Either switch actuates both trains. Also actuates Containment Ventilation Isolation (CVI).
3.a.(2)	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the Phase A equipment.
3.a.(3)	Safety Injection (Any SI signal)		Initiated by all Functions that initiate SI. (Function 1)
3.b	Phase B Isolation		Actuated by Containment Pressure-High 3 or manually. RCPs need to be secured as CCW will be isolated.
3.b.(1)	Manual (2/2 handswitches)	1/2 locations	Accomplished by the same switches that actuate Containment Spray. When the two switches in either set are turned simultaneously, Phase B Containment Isolation and Containment Spray will be actuated in both trains.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
3.b.(2)	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the Phase B equipment.
3.b.(3)	Containment Pressure High 3	2/4	This Function requires the bistable output to energize to perform its required action. It is not desirable to have a loss of power actuate containment spray, since the consequences of an inadvertent actuation of containment spray could be serious. Note that this Function also has the inoperable channel placed in bypass rather than trip to decrease the probability of an inadvertent actuation. Four channels are used in a two-out-of-four logic configuration.
4	Steam Line Isolation		Provides protection in the event of an SLB inside or outside containment. Rapid isolation of the steam lines will limit the steam break accident to the blowdown from one SG, at most.
4.a	Manual (2 handswitches)	1/2	Accomplished from the control room. There are two switches in the control room and either switch can initiate action to immediately close all MSIVs.
4.b	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the SLI equipment.
4.c	Containment Pressure High 2	2/3	Actuates closure of the MSIVs in the event of a LOCA or an SLB inside containment to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
4.d	Steam Line Pressure		Provides closure of the MSIVs in the event of an SLB to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment.
4.d.(1)	Low	2/3	Function provides closure of the MSIVs in the event of a feed line break to ensure a supply of steam for the turbine driven AFW pump. May block below P-11
4.d.(2)	Negative Rate - High (1/4 steam lines)	2/3	Provides closure of the MSIVs for an SLB when less than the P-11 setpoint to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment.
5	Turbine Trip & Feedwater Isolation		The primary functions of the Turbine Trip and Feedwater Isolation signals are to prevent damage to the turbine due to water in the steam lines and to stop the excessive flow of feedwater into the SGs.
5.a	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating turbine trip and FWI.
5.b	SG Water Level High-High P-14 (1 of 4 SGs)	2/3	P-14 (Protection Grade Signal) provides protection against excessive feedwater flow. Trips MFW pumps Trips Main Turbine Generates FWI signal
5.c	Safety Injection (Any SI signal)		Initiated by all Functions that initiate SI.
6	Auxiliary Feedwater		Provide a secondary side heat sink for the reactor in the event that the MFW System is not available.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
6.a	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the AFW equipment.
6.c	SG Water Level Low-Low (1 of 4 SGs)	2/4	Provides protection against a loss of heat sink. A feed line break, inside or outside of containment, or a loss of MFW, would result in a loss of SG water level.
6.d	Safety Injection (Any SI signal)		Initiated by all Functions that initiate SI.
6.e	Loss of Offsite Power (1 per train)	1/2	During a loss of offsite power, to both safety related busses feeding the motor driven AFW pumps, the loss of power to the bus feeding the turbine driven AFW pump valve control motor will start the turbine driven AFW pump to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip. Blackout undervoltage starts the DGs.
6.g	Trip of All Main Feedwater Pumps (2 per pump)	2/2	A Trip of all MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure.
7	Automatic Switchover to Containment Sump		At the end of the injection phase of a LOCA, the RWST will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the RHR pumps is semi-automatically switched to the containment recirculation sumps.

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
7.a	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the Auto-Switchover equipment.
7.b	Refueling Water Storage Tank (RWST) Level Low-Low	2/4	During the injection phase of a LOCA, the RWST is the source of water for all ECCS pumps. A low-low level in the RWST coincident with an SI signal provides protection against a loss of water for the ECCS pumps and indicates the end of the ECCS injection phase of the LOCA.
8	ESFAS Interlocks		Interlock Functions back up manual actions to ensure by passable functions are in operation under the conditions assumed in the safety analyses.
8.a	P-4, Reactor Trip (1 per train)	1/2	The P-4 interlock is enabled when a reactor trip breaker (RTB) and its associated bypass breaker are open. The P-4 permissive also prevents re-actuation of safety injection after a manual reset of safety injection following at least a 60 second delay time. This Function allows operators to take manual control of SI systems after the initial phase of injection is complete. Once SI is blocked, automatic actuation of SI cannot occur until the RTBs have been manually closed. • Trips main turbine • FWI with low Tavg • Arms Steam Dumps • Prevents opening FWIVs

Table E1-6, Engineered Safety Features Actuation System (ESFAS) Instrumentation Functions

ESFAS Function		Degree of Redundancy-Coincidence	Notes
8.b	P-11, Pressurizer Pressure	2/3	Permits a normal unit cooldown and depressurization without actuation of SI or main steam line isolation. Below setpoint operator can manually block; • PRZR Press low SI, • MSL Press low SI, and • Enables MSL Negative rate Above setpoint blocks are automatically removed.

Table E1-7, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentaion Functions

LOP DG Start Function		Degree of Redundancy-Coincidence	Notes
1	Automatic Actuation Logic and Actuation Relays (2 trains)	1/2	Sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals.
2	Preferred offsite source bus undervoltage	2/2	If not restored to OPERABLE within one hour declare preferred offsite power source inoperable and within 6 hours open supply breaker to exit applicability. Requires entry into LCO 3.8.1.
3	Alternate offsite source bus undervoltage	2/2	If not restored to OPERABLE within one hour declare alternate offsite power source inoperable and within 6 hours open supply breaker to exit applicability. Requires entry into LCO 3.8.1.
4	6.9 kV Class 1E bus undervoltage	2/2	Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Group consists of two sensing relays per bus that provide input to two-out-of-two logic.
5	6.9 kV Class 1E bus degraded voltage	2/2	Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Group consists of two sensing relays per bus that provide input to two-out-of-two logic.
6	480 V Class 1E low grid undervoltage	2/2	Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Group consists of two sensing relays per bus that provide input to two-out-of-two logic.

Table E1-7, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentaion Functions

LOP DG Start Function		Degree of Redundancy-Coincidence	Notes
7	480 V Class 1E bus degraded voltage	2/2	Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Group consists of two sensing relays per bus that provide input to two-out-of-two logic.

Table E1-8, Event Protection and Diverse Functions

Event	Primary Protection	Diverse/DID Protection
Uncontrolled RCCA Bank Withdrawal from Subcritical	2.b. Power Range Neutron Flux Low setpoint	3. Power Range Neutron Flux Rate High (Positive Rate) 4. Intermediate Range Neutron Flux High 5. Source Range Neutron Flux High
Uncontrolled RCCA Bank Withdrawal at Power	2.a. Power Range Neutron Flux High setpoint 6. Overtemperature N-16 7. Overpower N-16	8.b. Pressurizer Pressure High 9. Pressurizer Water Level High
RCCA Drop	6. Overtemperature N-16	8.b. Pressurizer Pressure High
CVCS Malfunction Resulting in Boron Dilution	2.b. Power Range Neutron Flux Low setpoint 2.a. Power Range Neutron Flux High setpoint	6. Overtemperature N-16 7. Overpower N-16
Startup of Inactive Loop	10. Reactor Coolant Flow Low (1 of 4 loops above P-9)) 10. Reactor Coolant Flow Low (2 of 4 loops below P-9))	12. Undervoltage RCPs 13. Underfrequency RCPs
Feedwater Enthalpy Reduction Incident	2.a. Power Range Neutron Flux High setpoint 6. Overtemperature N-16 7. Overpower N-16	8.a. Pressurizer Pressure Low
Excessive Feedwater Flow	ESF 5.b. SG Water Level High-High (P-14)	2.a. Power Range Neutron Flux High setpoint 6. Overtemperature N-16 7. Overpower N-16 16.a. Low Fluid Oil Pressure 16.b. Turbine Stop Valve Closure
Excessive Load Increase Incident	2.a. Power Range Neutron Flux High setpoint 6. Overtemperature N-16 7. Overpower N-16	8.a. Pressurizer Pressure Low
Loss of Flow/Locked Rotor	10. Reactor Coolant Flow Low (1 of 4 loops above P-9)) 10. Reactor Coolant Flow Low (2 of 4 loops below P-9))	8.b. Pressurizer Pressure High 12. Undervoltage RCPs 13. Underfrequency RCPs
Loss of External Electrical Load/Turbine Trip	6. Overtemperature N-16 7. Overpower N-16 8.b. Pressurizer Pressure High	9. Pressurizer Water Level High 16.a. Low Fluid Oil Pressure 16.b. Turbine Stop Valve Closure 14. SG Water Level Low-Low ESF 6.c. SG Water Level Low-Low

Table E1-8, Event Protection and Diverse Functions

Event	Primary Protection	Diverse/DID Protection
Loss of Normal Feedwater	14. SG Water Level Low-Low ESF 6.c. SG Water Level Low-Low	8.b. Pressurizer Pressure High 9. Pressurizer Water Level High
Loss of AC Power (Station Blackout)	14. SG Water Level Low-Low ESF 6.c. SG Water Level Low-Low	8.b. Pressurizer Pressure High 9. Pressurizer Water Level High
Feedwater Linebreak	14. SG Water Level Low-Low ESF 6.c. SG Water Level Low-Low	6. Overtemperature N-16 7. Overpower N-16 8.b. Pressurizer Pressure High 9. Pressurizer Water Level High ESF 1.e. Steam Line Pressure Low 4.d.(1) Steam Line Pressure Low
Steamline Break	ESF 4.d.(1) Steam Line Pressure Low 1.d. Pressurizer Pressure Low	2.a. Power Range Neutron Flux High setpoint 6. Overtemperature N-16 7. Overpower N-16 ESF 1.c. Containment Pressure High 1 4.c. Containment Pressure High 2
RCCA Ejection	2.a. Power Range Neutron Flux High setpoint	3. Power Range Neutron Flux Rate High (Positive Rate) 4. Intermediate Range Neutron Flux High 5. Source Range Neutron Flux High ESF 1.c. Containment Pressure High 1 1.d. Pressurizer Pressure Low
Loss of Coolant Accident	ESF 1.d. Pressurizer Pressure Low	ESF 1.c. Containment Pressure High 1
Steam Generator Tube Rupture	6. Overtemperature N-16 7. Overpower N-16	8.a. Pressurizer Pressure Low ESF 1.d. Pressurizer Pressure Low
Spurious SI	8.b. Pressurizer Pressure High	The PRZR PORVs and PRZR Safety Valves provide protection during a spurious SI event.
RCS Depressurization	8.a. Pressurizer Pressure Low ESF 1.d. Pressurizer Pressure Low	6. Overtemperature N-16 7. Overpower N-16

ENCLOSURE 7

License Amendment Request

Comanche Peak Nuclear Power Plant, Units 1 and 2

NRC Docket Nos. 50-445 and 50-446

Revise Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b"

PRA Model Update Process

1.0 Introduction

Section 4.0, Item 8 of the Nuclear Regulatory Commission's (NRC) Final Safety Evaluation [Ref. 1] for NEI 06-09-A, Revision 0-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," [Ref. 2] requires that the license amendment request (LAR) provide a discussion of the licensee's programs and procedures which assure the PRA models which support the RMTS are maintained consistent with the as-built/as-operated plant.

This enclosure describes the administrative controls and procedural processes applicable to configuration control of the PRA model used to support the Risk-Informed Completion Time (RICT) Program, which will be in place to ensure that these models reflect the as-built/as-operated plant. Plant changes, including physical modifications and procedure revisions, will be identified and reviewed prior to implementation to determine if they could impact the PRA models per STA-762 [Ref. 3] and STI-762.02 [Ref. 4]. The configuration control program will ensure these plant changes are incorporated into the PRA models as appropriate. The process will include discovered conditions associated with the PRA models, which will be addressed by the site Corrective Action Program.

Should a plant change or a discovered condition be identified that has a significant impact to the RICT Program calculations as defined by the above procedure, an unscheduled update of the PRA model will be implemented. Otherwise, the PRA model change is incorporated into a subsequent periodic model update. Such pending changes are considered when evaluating other changes until they are fully implemented into the PRA models.

2.0 PRA Model Update Process

2.1 Internal Event, Internal Flood, and Fire PRA Model Maintenance and Update

The risk management process ensures that the applicable PRA model used for the RICT Program reflects the as-built/as-operated plant for each of the Comanche Peak units. The PRA configuration control process delineates the responsibilities and guidelines for updating the full power internal events, internal flood, and fire PRA models, and includes both periodic and unscheduled PRA model updates.

The process includes provisions for monitoring potential impact areas affecting the technical elements of the PRA models (e.g., due to plant changes, plant/industry operational experience, or errors or limitations identified in the model), assessing the individual and cumulative risk impact of unincorporated changes, and controlling the model and necessary computer files, including those associated with the Real Time Risk model.

2.2 Review of Plant Changes for Incorporation into the PRA Model

1. Plant changes or discovered conditions are reviewed for potential impact to the PRA models, including the Real Time Risk Monitor model (NEI 06-09-A, Section 2.3.4, Items 7.2 and 7.3, and 2.3.5, Items 9.2 and 9.3).
2. Plant changes that meet the criteria defined in Reference 4 (including consideration of the cumulative impact of other pending changes) will be incorporated in the applicable PRA model(s), consistent with the NEI 06-09-A guidance. Otherwise, the change is assigned a priority and is incorporated at a subsequent periodic update consistent with procedural requirements. (NEI 06-09-A, Section 2.3.5, Item 9.2)

3. PRA updates for plant changes are performed at least once every 48 months. A single PRA model is used for both Comanche Peak units. Each Comanche Peak unit has a nominal 18-month refueling cycle; the outages are staggered by approximately 6 to 9 months. Therefore, a standard frequency of 48 months for PRA model updates is specified.

   In order to capture input from both units across two refueling cycles it could take between 42 and 45 months based on variations in operating cycles. With CPNPP periodic basis at 48 months we ensure that the update includes two refueling cycles for each unit while not exceeding two refueling cycles on either unit.

4. If a PRA model change is required for the Real Time Risk Monitor model, but cannot be immediately implemented for a significant plant change or discovered condition, either:

   a. Interim analyses to address the expected risk impact of the change will be performed. In such a case, these interim analyses become part of the RICT Program calculation process until the plant changes are incorporated into the PRA model during the next update. The use of such bounding analyses is consistent with the guidance of NEI 06-09-A.

   b. Appropriate administrative restrictions on the use of the RICT Program for extended Completion Times are put in place until the model changes are completed, consistent with the guidance of NEI 06-09-A.

These actions satisfy NEI 06-09-A, Section 2.3.5, Item 9.3.

3.0 References

1. Letter from Jennifer M. Golder (NRC) to Biff Bradley (NEI), "Final Safety Evaluation for Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09-A, 'Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines,'" dated May 17, 2007 (ADAMS Accession No. ML071200238)
2. Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0-A, dated October 12, 2012 (ADAMS Accession No. ML12286A322)
3. STA-762, "Risk Informed Completion Time Implementation"
4. STI-762.02, "Risk-Informed Completion Times - PRA Model Configuration Control"