MODEL APPLICATION FOR ADOPTION OF TSTF TRAVELER TSTF-493, REVISION 4,

"CLARIFY APPLICATION OF SETPOINT METHODOLOGY FOR LSSS FUNCTIONS"

OPTION A, ADDITION OF SURVEILLANCE NOTES

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

SUBJECT: [PLANT]
DOCKET NO. 50-[XXX]
LICENSE AMENDMENT REQUEST FOR ADOPTION OF TECHNICAL SPECIFICATIONS TASK FORCE (TSTF) TRAVELER TSTF-493, REVISION 4, "CLARIFY APPLICATION OF SETPOINT METHODOLOGY FOR LSSS FUNCTIONS"

{NOTE: This model application and model safety evaluation are only applicable for adoption of TSTF-493 Option A – the Addition of Surveillance Notes option.}

In accordance with the provisions of Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), [LICENSEE] is submitting a request for an amendment to [PLANT] Technical Specifications (TS) to incorporate the NRC-approved TSTF-493, Revision 4 to be consistent with Option A. The availability of this TS improvement was announced in the *Federal Register* on [DATE] ([ ] FR [ ]).

The proposed amendment would revise the TS by adding requirements to assess channel performance during testing that verifies instrument channel setting values established by the plant-specific setpoint methodology(ies).

{NOTE: This paragraph is applicable only for adoption of TSTF-493 Option A with changes to setpoint values.} Attachment 1 provides a description and assessment of the proposed changes including the requested confirmation of applicability and plant-specific verifications; technical analyses; regulatory analyses; and environmental considerations. Attachment 2 provides the plant-specific list of instrument Functions to be annotated with the TSTF-493 Surveillance Notes. Attachment 3 provides summary calculations for the revised setpoints. Attachment 4 provides markup pages of existing TS and TS Bases to show the proposed change in accordance with TSTF-493, Revision 4, Option A. Attachment 5 provides revised (clean) TS pages.

{NOTE: This paragraph is applicable only for adoption of TSTF-493 Option A without changes to setpoint values.} Attachment 1 provides a description and analysis of the proposed changes including the requested confirmation of applicability and plant-specific verifications; technical analyses; regulatory analyses; and environmental considerations. No changes to any setpoint values are proposed. Attachment 2 provides the plant-specific evaluation identifying the list of instrument Functions to be annotated with the TSTF-493 Surveillance Notes. Attachment 3 provides markup pages of existing TS and TS Bases to show the proposed

change in accordance with TSTF-493, Revision 4, Option A. Attachment 4 provides revised (clean) TS pages.

[LICENSEE] requests approval of the proposed license amendment by [DATE], with the amendment being implemented [BY DATE OR WITHIN X DAYS].

In accordance with 10 CFR 50.91(a)(1), "Notice for Public Comment," the analysis about the issue of no significant hazards consideration using the standards in 10 CFR 50.92 is being provided to the Commission.

In accordance with 10 CFR 50.91(b)(1), "Notice for Public Comment; State Consultation," a copy of this application and the reasoned analysis about no significant hazards considerations is being provided to the designated [STATE] Official.

I declare [or certify, verify, state] under penalty of perjury that the foregoing is correct and true.

Executed on [date] [Signature]

If you should have any questions about this submittal, please contact [NAME, TELEPHONE NUMBER].

Sincerely,

[Name, Title]

Attachments: [As stated or provide list]

cc: [NRR Project Manager]
[Regional Office]
[Resident Inspector]
[State Contact]

ATTACHMENT 1

EVALUATION OF PROPOSED CHANGE

1.0 DESCRIPTION

The proposed amendment would revise the Technical Specifications (TSs) by applying additional testing requirements to applicable instrument Functions, listed in Technical Specifications Task Force (TSTF) Improved Standard Technical Specifications (STS) Change Traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS [limiting safety system settings] Functions," Attachment A, "Identification of Instrument Functions to be Annotated with the TSTF-493 Footnotes." Attachment A contains Functions related to those variables that have a significant safety function, as defined in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(1)(ii)(A), thereby ensuring instrumentation will function as required to initiate protective systems or actuate mitigating systems at values equal to or more conservative than the point assumed in applicable safety analyses. These TS changes are made by the addition of individual surveillance Note requirements to applicable instrument Functions in accordance with Option A of TSTF-493, Revision 4.

This change is consistent with Option A of NRC-approved Revision 4 to TSTF-493. The availability of this TS improvement was announced in the *Federal Register* on [DATE] ([ ] FR [ ]).

2.0 PROPOSED CHANGE

{NOTE: Throughout this model application the term "Limiting Trip Setpoint (LTSP)" refers to the calculated limiting setpoint setting based on vendor-specific setpoint methodologies for Babcock and Wilcox, Combustion Engineering, General Electric Boiling Water Reactor (BWR)/4 and BWR/6 plants, which correspond to the STS NUREGs-1430, 1432, 1433, and 1434. The term "Nominal Trip Setpoint (NTSP)" is the LTSP with margin added. This model application is written for plants using "LTSP." For Westinghouse plants, corresponding to STS NUREG-1431, the calculated limiting setpoint setting based on vendor-specific methodology is typically defined as the "Nominal Trip Setpoint (NTSP)." Using this convention, an application for a NUREG-1431 plant would replace "Limiting Trip Setpoint" or "LTSP" with "Nominal Trip Setpoint" or "NTSP" as appropriate and would replace "Nominal Trip Setpoint" or "NTSP" with "field setting." For plants using other terminology, the terms in this model application may be replaced with like terms consistent with the plant-specific setpoint methodology and conforming changes should be made to TSs and TSs Bases. Plant-specific terminology is not considered to be a deviation with Revision 4 of TSTF-493.}

{NOTE: This paragraph is applicable only for adoption of TSTF-493 Option A with changes to setpoint values.} [LICENSEE] proposes to add TSTF-493, Revision 4, Option A TS surveillance Notes with changes to setpoint values to [PLANT] instrumentation Functions.

{NOTE: This paragraph is applicable only for adoption of TSTF-493 Option A with no changes to setpoint values.} [LICENSEE] proposes to add TSTF-493, Revision 4, Option A TS surveillance Notes with no changes to setpoint values to [PLANT] instrumentation Functions.

[LICENSEE] has reviewed the model safety evaluation (SE) referenced in the *Federal Register* Notice of Availability published on [DATE] ([ ] FR [ ]). As described herein, [LICENSEE] has concluded that the justifications presented in TSTF-493, Revision 4, Option A, and the

model SE prepared by the NRC staff for Option A are applicable to [PLANT] support these changes to the [PLANT] TSs.

[LICENSEE] is [not] proposing variations or deviations from the TS changes described in TSTF-493, Revision 4 or the NRC staff's model SE referenced in the Notice of Availability. [Discuss any differences with Option A of TSTF-493, Revision 4, and provide justification for these differences. Additionally, include plant-specific information explaining the plant-unique design feature(s) that require such variations or deviations. Plant-specific system names, TS numbering and titles are not considered to be differences with TSTF-493 or the NRC staff's model SE.]

3.0 BACKGROUND

The background for this application is adequately addressed by the NRC Notice of Availability published in the *Federal Register* on [DATE] ([ ] FR [ ]).

4.0 TECHNICAL ANALYSIS

The Technical Analysis for this application is described in TSTF-493 as referenced in the NRC Notice of Availability published in the *Federal Register* on [DATE] ([ ] FR [ ]). Plant-specific information related to the Technical Analysis is described below to document that the content of TSTF-493, Revision 4, Option A, is applicable to [PLANT].

4.1 Use of the Term of "Limiting Trip Setpoint"

The term "Limiting Trip Setpoint" (LTSP) is [PLANT] terminology for the setpoint value calculated by means of the plant-specific setpoint methodology documented in the Final Safety Analyses Report (FSAR) or a document incorporated by reference into the FSAR. The actual trip setpoint may be more conservative than the LTSP. The LTSP is the LSSS[1] which is required to be in the TSs by 10 CFR 50.36.

The LTSP is the least conservative value to which the instrument channel is adjusted to actuate. The Allowable Value[2] (AV) is derived from the LTSP. The LTSP is the limiting setting for an operable channel trip setpoint considering all credible instrument errors associated with the instrument channel. The LTSP is the least conservative value (with an as-left tolerance (ALT)) to which the channel must be reset at the conclusion of periodic testing to ensure that the analytical limit (AL) will not be exceeded during an anticipated operational occurrence or accident before the next periodic surveillance or calibration. It is impossible to set a physical instrument channel to an exact value, so a calibration tolerance is established around the LTSP. Therefore, an instrument adjustment is considered successful if the LTSP as-left instrument setting is within the setting tolerance (i.e., a range of values around the LTSP). The Nominal Trip Setpoint (NTSP) is the LTSP with margin added. The NTSP is as conservative as or more conservative than the LTSP.

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1 10 CFR 50.36(c)(1(II)(a) states: "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions."

2 The instrument setting "Allowable Value" is a limiting value of an instrument's as-found trip setting used during surveillances. The AV is more conservative than the Analytical Limit (AL) to account for applicable instrument measurement errors consistent with the plant-specific setpoint methodology. If during testing, the actual instrumentation setting is less conservative than the AV, the channel is declared inoperable and actions must be taken consistent with the TS requirements.

4.2 Addition of Channel Performance Surveillance Notes to TS Instrumentation Functions

The determination to include surveillance Notes for specific Functions in the TS is based on these Functions being automatic protective devices related to variables having significant safety functions as delineated by 10 CFR 50.36(c)(1)(ii)(A). There are two surveillance Notes added to the TSs regarding the use of TS AVs for operability determinations and for assessing channel performance. Evaluation of Exclusion Criterion, (Section 4.3 below) discusses the principles applied to determine which Functions are to be annotated with the two surveillance Notes. The list of affected Functions is provided in Attachment 2 of this amendment request.

Surveillance Note 1 states, "If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service."

Surveillance Note 2 states:

> The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Limiting Trip Setpoint (LTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (Nominal Trip Setpoint) to confirm channel performance. The Limiting Trip Setpoint and the methodologies used to determine the as-found and as-left tolerances are specified in the [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference.]

Setpoint calculations establish an LTSP based on the AL of the Safety Analysis to ensure that trips or protective actions will occur prior to exceeding the process parameter value assumed by the Safety Analysis calculations. These setpoint calculations also calculate an allowed limit of expected change (i.e., the AFT) between performances of the surveillance test for assessing the value of the setpoint setting. The least conservative as-found instrument setting value that a channel can have during calibration without requiring performing a TS remedial action is the setpoint AV. Discovering an instrument setting to be less conservative than the setting AV indicates that there may not be sufficient margin between the setting and the AL. TSs [{use only for NUREG-1430, 1432, 1433, and 1434 plants} channel calibrations, channel functional tests (with setpoint verification), and trip unit calibrations,] [{use only for NUREG-1431 plants} channel calibrations, channel operational tests, and trip actuation operational tests (with setpoint verification)] are performed to verify channels are operating within the assumptions of the setpoint methodology calculated LTSP and that channel settings have not exceeded the TS AVs. When the measured as-found setpoint is non-conservative with respect to the AV, the channel is inoperable and the actions identified in the TSs must be taken.

The first surveillance Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its AFT but conservative with respect to the AV. Evaluation of channel performance will verify that the channel will continue to perform in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service.

Verifying that a trip setting is conservative with respect to the AV when a surveillance test is performed does not by itself verify the instrument channel will operate properly in the future.

Although the channel was operable during the previous surveillance interval, if it is discovered that channel performance is outside the performance predicted by the plant setpoint calculations for the test interval, then the design basis for the channel may not be met, and proper operation of the channel for a future demand cannot be assured. Surveillance Note 1 formalizes the establishment of the appropriate AFT for each channel. This AFT is applied about the LTSP or about any other more conservative setpoint. The AFT ensures that channel operation is consistent with the assumptions or design inputs used in the setpoint calculations and establishes a high confidence of acceptable channel performance in the future. Because the AFT allows for both conservative and non-conservative deviation from the LTSP, changes in channel performance that are conservative with respect to the LTSP will also be detected and evaluated for possible effects on expected performance.

To implement surveillance Note 2 the ALT for some instrumentation Function channels is established to ensure that realistic values are used that do not mask instrument performance. Setpoint calculations assume that the instrument setpoint is left at the LTSP within a specific ALT (e.g., 25 psig ± 2 psig). A Tolerance band is necessary because it is not possible to read and adjust a setting to an absolute value due to the readability and/or accuracy of the test instruments or the ability to adjust potentiometers. The ALT is normally as small as possible considering the tools and the objective to meet an as low as reasonably achievable calibration setting of the instruments. The ALT is considered in the setpoint calculation. Failure to set the actual plant trip setpoint to the LTSP (or more conservative than the LTSP), and within the ALT, would invalidate the assumptions in the setpoint calculation because any subsequent instrument drift would not start from the expected as-left setpoint.

4.3 Evaluation of Exclusion Criterion

Exclusion criteria are used to determine which Functions do not need to receive the proposed footnotes, as discussed in TSTF-493, Revision 4. Instruments are excluded from the additional requirements when their functional purpose can be described as (1) a manual actuation circuit, (2) an automatic actuation logic circuit, or (3) an instrument function that derives input from contacts which have no associated sensor or adjustable device. Many permissives or interlocks are excluded if they derive input from a sensor or adjustable device that is tested as part of another TS function. The list of affected Functions identified in Attachment 2 of this amendment request was developed on the principle that all Functions in the affected TSs are included unless one or more of the exclusion criterion apply. If the excluded functions differ from the list of excluded functions in TSTF-493, Revision 4, a justification for that deviation is provided in Attachment 2.

{NOTE: Section 4.4 is applicable only for adoption of TSTF-493 Option A with changes to setpoint values.}

4.4 Setpoint Values

[LICENSEE] proposes changes to the following TSs instrument setting limits:

Function 1, current value, proposed value
Function 2, current value, proposed value
Etc.

5.0 REGULATORY SAFETY ANALYSIS

5.1 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

[LICENSEE] has evaluated the proposed changes to the TS using the criteria in 10 CFR 50.92, "Application for amendment of license, construction permit, or early site permit" and has determined that the proposed changes do not involve a significant hazards consideration.

Basis for proposed no significant hazards consideration: As required by 10 CFR 50.91, (a), "Notice for public comment," the [LICENSEE] analysis of the issue of no significant hazards consideration is presented below:

1: Does the Proposed Change Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated?

Response: No

The proposed change adds test requirements to TS instrument functions related to those variables that have a significant safety function to ensure that instruments will function as required to initiate protective systems or actuate mitigating systems at the point assumed in the applicable safety analysis. Surveillance tests are not an initiator to any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The systems and components required by the TSs for which surveillance tests are added are still required to be operable, meet the acceptance criteria for the surveillance requirements, and be capable of performing any mitigation function assumed in the accident analysis. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2: Does the Proposed Change Create the Possibility of a New or Different Kind of Accident from any Accident Previously Evaluated?

Response: No

{For setpoint changes: The change involves a physical alteration of the plant, i.e., a change in instrument setpoint.} {No setpoint changes: The change does not involve a physical alteration of the plant, i.e., no new or different type of equipment will be installed.} The change does not alter assumptions made in the safety analysis but ensures that the instruments perform as assumed in the accident analysis. The proposed change is consistent with the safety analysis assumptions. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3: Does the Proposed Change Involve a Significant Reduction in a Margin of Safety?

Response: No

The proposed change adds test requirements that will assure that (1) technical specifications instrumentation Allowable Values will be limiting settings for assessing instrument channel operability and (2) will be conservatively determined so that evaluation of instrument performance history and the ALT requirements of the calibration

procedures will not have an adverse effect on equipment operability. The testing methods and acceptance criteria for systems, structures, and components, specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis including the updated Final Safety Analysis Report. There is no impact to safety analysis acceptance criteria as described in the plant licensing basis because no change is made to the accident analysis assumptions. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

5.2 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA

A description of the proposed TSs change and its relationship to applicable regulatory requirements were published in the *Federal Register* Notice of Availability on [DATE] ([ ] FR [ ]). [LICENSEE] has reviewed the NRC staff's model SE published as part of the Notice of Availability and concluded that the regulatory evaluation section is [not] applicable to [PLANT]. {NOTE: If regulatory evaluation section in model SE is not applicable, discuss/provide applicable regulatory requirements and criteria. Additionally, discuss the effect of any changes on the NRC staff's model SE, including plant-specific information explaining the plant-unique design feature(s) that require such variations or deviations. Plant-specific system names, specification numbering and titles are not considered to be differences with TSTF-493, Revision 4 or the NRC staff's model SE.}

6.0 ENVIRONMENTAL CONSIDERATION

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 Part 20, and 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 effluent 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 change.

7.0 REFERENCES

{NOTE: Provide list of references}

ATTACHMENT 2

IDENTIFICATION OF INSTRUMENT FUNCTIONS TO BE ANNOTATED WITH SURVEILLANCE NOTES FOR APPLICATION OF TSTF-493, REVISION 4, "CLARIFY APPLICATION OF SETPOINT METHODOLOGY FOR LSSS FUNCTIONS"

{NOTE: Each licensee proposing to adopt TSTF-493, Option A, must annotate their plant-specific Technical Specifications (TS) with surveillance Notes consistent with the Functions listed in the applicable Standard Technical Specifications (STS) Instrumentation Tables that follow below. The Tables also identify instrumentation Functions for which surveillance Notes are not required to be applied to instrument Functions because the Functions meet one or more of the exclusion criteria. Licensees may deviate from the TSTF-493 Table based on the plant-specific design. Licensees must include a justification of the deviation. In particular, the licensee justification must include plant-specific information explaining the plant-unique design feature(s) that require such deviations. In addition, the licensee must confirm that the exclusion criterion are met for each bypass, permissive, and interlock instrumentation Function. Plant-specific system names, specification numbering and titles are not considered to be differences with TSTF-493, Revision 4. However, to aid the NRC staff review, licensees should indicate the comparable TSTF-493, Revision 4, Function if it is not clear from the plant-specific name.

Licensees should only include in their submittal the Table that corresponds to their plant design.}

The following Tables provide the results of application of the three exclusion criteria by identifying instrumentation Functions, by TS Table, for which surveillance Notes 1 and 2 apply and for those instrumentation Functions which are excluded from surveillance Notes.

Babcock and Wilcox Plants (NUREG-1430) Instrumentation Functions Annotated with Surveillance Notes

Table 3.3.1-1, "Reactor Protection System Instrumentation" Functions

1. Nuclear Overpower
   a. High Setpoint
   b. Low Setpoint
2. RCS High Outlet Temperature
3. RCS High Pressure
4. RCS Low Pressure
5. RCS Variable Low Pressure
6. Reactor Building High Pressure
7. Reactor Coolant Pump to Power
8. Nuclear Overpower RCS Flow and Measured AXIAL POWER IMBALANCE
9. Main Turbine Trip (Control Oil Pressure)
10. Loss of Main Feedwater Pumps (Control Oil Pressure)
11. Shutdown Bypass RCS High Pressure

Table 3.3.5-1, "Engineered Safety Feature Actuation System Instrumentation" Functions

1. Reactor Coolant System Pressure - Low Setpoint (HPI Actuation, RB Isolation, RB Cooling, EDG Start)
2. Reactor Coolant System Pressure - Low Low Setpoint (HPI Actuation, LPI Actuation, RB

Isolation, RB Cooling)
3. Reactor Building (RB) Pressure - High Setpoint (HPI Actuation, LPI Actuation, RB Isolation, RB Cooling)
4. Reactor Building Pressure - High High Setpoint (RB Spray Actuation)

Babcock and Wilcox Plants (NUREG-1430) Instrumentation Functions Excluded from Surveillance Notes

No TS instrumentation Functions were excluded from assessing the as-found and as-left tolerances during TS testing.

Westinghouse Plant (NUREG-1431) Instrumentation Functions Annotated with Surveillance Notes

Table 3.3.1-1, "Reactor Trip System Instrumentation" Functions

2. Power Range Neutron Flux
   a. High
   b. Low
3. Power Range Neutron Flux Rate
   a. High Positive Rate
   b. High Negative Rate
4. Intermediate Range Neutron Flux
5. Source Range Neutron Flux
6. Overtemperature ΔT
7. Overpower ΔT
8. Pressurizer Pressure
   a. Low
   b. High
9. Pressurizer Water Level - High
10. Reactor Coolant Flow - Low
12. Undervoltage RCPs
13. Underfrequency RCPs
14. Steam Generator (SG) Water Level - Low Low
15. SG Water Level - Low
    Coincident with Steam Flow/Feedwater Flow Mismatch
16. Turbine Trip
    a. Low Fluid Oil Pressure

Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation" Functions

1. Safety Injection
   c. Containment Pressure - High 1
   d. Pressurizer Pressure - Low
   e. Steam Line Pressure
      (1) Low
      (2) High Differential Pressure Between Steam Lines
   f. High Steam Flow in Two Steam Lines
      Coincident with Tavg - Low Low
   g. High Steam Flow in Two Steam Lines
      Coincident with Steam Line Pressure - Low
2. Containment Spray
   c. Containment Pressure High - 3 (High High)
   d. Containment Pressure High - 3 (Two Loop Plants)

3. Containment Isolation
    b. Phase B Isolation
        (3) Containment Pressure High - 3 (High High)
4. Steam Line Isolation
    c. Containment Pressure - High 2
    d. Steam Line Pressure
        (1) Low
        (2) Negative Rate - High
    e. High Steam Flow in Two Steam Lines
        Coincident with Tavg - Low Low
    f. High Steam Flow in Two Steam Lines
        Coincident with Steam Line Pressure - Low
    g. High Steam Flow
        Coincident with Tavg - Low Low
    h. High High Steam Flow
5. Turbine Trip and Feedwater Isolation
    b. SG Water Level - High High (P-14)
6. Auxiliary Feedwater
    c. SG Water Level - Low Low
    e. Loss of Offsite Power
    f. Undervoltage Reactor Coolant Pump
    g. Trip of all Main Feedwater Pumps
    h. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low
7. Automatic Switchover to Containment Sump
    b. Refueling Water Storage Tank (RWST) Level - Low Low
    c. RWST Level - Low Low
        Coincident with Containment Sump Level - High

Westinghouse Plant (NUREG-1431) Instrumentation Functions Excluded from Surveillance Notes

Table 3.3.1-1, "Reactor Trip System Instrumentation" Functions
1. Manual Reactor Trip – (Manual actuation excluded from surveillance Notes)
11. Reactor Coolant Pump (RCP) Breaker Position – (Mechanical component excluded from surveillance Notes)
    b. Turbine Stop Valve Closure (Mechanical component excluded from surveillance Notes)
17. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS) (Automatic actuation logic circuit excluded from surveillance Notes)
18. Reactor Trip System Interlocks is excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)
19. Reactor Trip Breakers (RTBs) (Mechanical component excluded from surveillance Notes)
20. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms (Mechanical component excluded from surveillance Notes)
21. Automatic Trip Logic (Automatic actuation logic circuit excluded from surveillance Notes)

Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation" Functions
1. Safety Injection
    a. Manual Initiation (Manual actuation excluded from surveillance Notes)
    b. Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)

2. Containment Spray
   a. Manual Initiation - (Manual actuation excluded from surveillance Notes)
   b. Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
3. Containment Isolation
   a. Phase A Isolation
      (1) Manual Initiation (Manual actuation excluded from surveillance Notes)
      (2) Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
      (3) Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
   b. Phase B Isolation
      (1) Manual Initiation (Manual actuation excluded from surveillance Notes)
      (2) Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
4. Steam Line Isolation
   a. Manual Initiation (Manual actuation excluded from surveillance Notes)
   b. Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
   g. High Steam Flow
      Coincident with Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
   h. High High Steam Flow
      Coincident with Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
5. Turbine Trip and Feedwater Isolation
   a. Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
   c. Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
6. Auxiliary Feedwater
   a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System) (Automatic actuation logic circuit excluded from surveillance Notes)
   b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS) (Automatic actuation logic circuit excluded from surveillance Notes)
   d. Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
7. Automatic Switchover to Containment Sump
   a. Automatic Actuation Logic and Actuation Relays (Automatic actuation logic circuit excluded from surveillance Notes)
   b. Refueling Water Storage Tank (RWST) Level - Low Low
      Coincident with Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
   c. RWST Level - Low Low
      Coincident with Safety Injection (Automatic actuation logic circuit excluded from surveillance Notes)
8. ESFAS Interlocks excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)

Combustion Engineering Plants (NUREG-1432) Instrumentation Functions Annotated with Surveillance Notes

Specification 3.3.1, “Reactor Protection System Instrumentation” Analog) Functions

1. Variable High Power Trip
2. Power Rate of Change - High
3. Reactor Coolant Flow - Low
4. Pressurizer Pressure - High
5. Containment Pressure - High
6. Steam Generator Pressure - Low

7a. Steam Generator A Level - Low
7b. Steam Generator B Level - Low

8. Axial Power Distribution - High

9a. Thermal Margin/Low Pressure (TM/LP)
9b. Steam Generator Pressure Difference

10. Loss of Load (turbine stop valve control oil pressure)

Table 3.3.4-1, "Engineered Safety Features Actuation System Instrumentation" (Analog) Functions

1. Safety Injection Actuation Signal (SIAS)
    a. Containment Pressure - High
    b. Pressurizer Pressure – Low
2. Containment Spray Actuation Signal
    a. Containment Pressure - High
3. Containment Isolation Actuation Signal
    a. Containment Pressure - High
    b. Containment Radiation - High
4. Main Steam Isolation Signal
    a. Steam Generator Pressure - Low
5. Recirculation Actuation Signal
    a. Refueling Water Tank Level - Low
6. Auxiliary Feedwater Actuation Signal (AFAS)
    a. Steam Generator A Level - Low
    b. Steam Generator B Level - Low
    c. Steam Generator Pressure Difference - High (A > B) or (B > A)

Table 3.3.1-1, "Reactor Protective System Instrumentation" (Digital) Functions

1. Linear Power Level - High
2. Logarithmic Power Level - High
3. Pressurizer Pressure - High
4. Pressurizer Pressure - Low
5. Containment Pressure - High
6. Steam Generator #1 Pressure - Low
7. Steam Generator #2 Pressure - Low
8. Steam Generator #1 Level - Low
9. Steam Generator #2 Level - Low
10. Reactor Coolant Flow, Steam Generator #1 - Low
11. Reactor Coolant Flow, Steam Generator #2 - Low
12. Loss of Load (turbine stop valve control oil pressure)
13. Local Power Density - High

14. Departure from Nucleate Boiling Ratio (DNBR) - Low

Table 3.3.5-1, "Engineered Safety Features Actuation System Instrumentation" (Digital) Functions

1. Safety Injection Actuation Signal
    a. Containment Pressure - High
    b. Pressurizer Pressure – Low
2. Containment Spray Actuation Signal
    a. Containment Pressure - High High
3. Containment Isolation Actuation Signal
    a. Containment Pressure - High
    b. Pressurizer Pressure - Low
4. Main Steam Isolation Signal
    a. Steam Generator Pressure - Low
    b. Containment Pressure - High
5. Recirculation Actuation Signal
    a. Refueling Water Storage Tank Level – Low
6. Emergency Feedwater Actuation Signal SG #1 (EFAS-1)
    a. Steam Generator Level - Low
    b. SG Pressure Difference - High
    c. Steam Generator Pressure - Low
7. Emergency Feedwater Actuation Signal SG #2 (EFAS-2)
    a. Steam Generator Level - Low
    b. SG Pressure Difference - High
    c. Steam Generator Pressure – Low

Combustion Engineering Plants (NUREG-1432) Instrumentation Functions Excluded from Notes

Table 3.3.5-1, "Engineered Safety Features Actuation System Instrumentation" (Digital) Functions

2. Containment Spray Actuation Signal
    a. Containment Pressure - High High
    b. Automatic SIAS (Automatic actuation logic circuit excluded from surveillance Notes)

BWR/4 Plants (NUREG-1433) Instrumentation Functions Annotated with Surveillance Notes

Table 3.3.1.1-1, "Reactor Protection System Instrumentation" Functions

1. Intermediate Range Monitors
    a. Neutron Flux - High
2. Average Power Range Monitors
    a. Neutron Flux - High, Setdown
b. Flow Biased Simulated Thermal Power - High
    c. Fixed Neutron Flux - High
    d. Downscale
3. Reactor Vessel Steam Dome Pressure - High
4. Reactor Vessel Water Level - Low, Level 3
6. Drywell Pressure - High
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low

Table 3.3.2.1-1, "Control Rod Block Instrumentation" Functions

1. Rod Block Monitor
    a. Low Power Range - Upscale
    b. Intermediate Power Range - Upscale
    c. High Power Range - Upscale

Table 3.3.4.1-1, "EOC-RPT Instrumentation" Functions

1. Trip Units
3. Turbine Control Valve - Fast Closure, Trip Oil Pressure - Low

Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation" Functions

1. Core Spray System
    a. Reactor Vessel Water Level - Low Low Low, Level 1
    b. Drywell Pressure - High
2. Low Pressure Coolant Injection (LPCI) System
    a. Reactor Vessel Water Level - Low Low Low, Level 1
    b. Drywell Pressure - High
    g. Low Pressure Coolant Injection Pump Discharge Flow - Low Bypass (If valve locked open, Function can be removed from TS)
3. High Pressure Coolant Injection (HPCI) System
    a. Reactor Vessel Water Level - Low Low, Level 2
    b. Drywell Pressure – High
    c. Reactor Vessel Water Level - High, Level 8 (Optional to include surveillance Notes or not)
    d. Condensate Storage Tank Level – Low (If mechanical device, excluded from surveillance Notes)
    e. Suppression Pool Water Level – High (If mechanical device, excluded from surveillance Notes)
    f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass) (If valve locked open, Function can be removed from TS)(If mechanical device, excluded from surveillance Notes)
4. Automatic Depressurization System (ADS) Trip System A
    a. Reactor Vessel Water Level - Low Low Low, Level 1
    b. Drywell Pressure - High
    d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)
5. ADS Trip System B
    a. Reactor Vessel Water Level - Low Low Low, Level 1
    b. Drywell Pressure - High
    d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)

Table 3.3.5.2-1, "Reactor Core Isolation Cooling System Instrumentation" Functions

1. Reactor Vessel Water Level - Low Low, Level 2
2. Reactor Vessel Water Level - High, Level 8 - (Optional to include surveillance Notes or not)
3. Condensate Storage Tank Level - Low (If mechanical device, excluded from surveillance Notes)
4. Suppression Pool Water Level - High (If mechanical device, excluded from surveillance Notes)

BWR/4 Plants (NUREG-1433) Instrumentation Functions Excluded From Surveillance Notes

Table 3.3.1.1-1, "Reactor Protection System Instrumentation" Functions

1. Intermediate Range Monitors
   b. Inop (Interlock excluded from surveillance Notes)
2. Average Power Range Monitors
   e. Inop (Interlock excluded from surveillance Notes)
5. Main Steam Isolation Valve - Closure (Mechanical device excluded from surveillance Notes)
7. Scram Discharge Volume Water Level - High
   a. Resistance Temperature Detector (Mechanical device excluded from surveillance Notes)
   b. Float Switch (Mechanical device excluded from surveillance Notes)
8. Turbine Stop Valve - Closure (Mechanical device excluded from surveillance Notes)
10. Reactor Mode Switch - Shutdown Position (Manual actuation excluded from surveillance Notes)
11. Manual Scram (Manual actuation excluded from surveillance Notes)

Table 3.3.2.1-1, "Control Rod Block Instrumentation" Functions

1. Rod Block Monitor
   d. Inop (Interlock excluded from surveillance Notes)
   e. Downscale (Not part of RPS or ECCS excluded from surveillance Notes)
   f. Bypass Time Delay (Permissive or interlock excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)
2. Rod Worth Minimizer (Not part of RPS or ECCS excluded from surveillance Notes)
3. Reactor Mode Switch - Shutdown Position (Manual actuation excluded from surveillance Notes)

Table 3.3.4.1-1, "EOC-RPT Instrumentation" Functions

2. Turbine Stop Valve - Closure (Mechanical component excluded from surveillance Notes)

Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation" Functions

1. Core Spray System
   c. Reactor Steam Dome Pressure - Low (Injection Permissive) (Actuation logic excluded from surveillance Notes)
   d. Core Spray Pump Discharge Flow - Low (Bypass) (Actuation logic excluded from surveillance Notes)
   e. Manual Initiation - Manual (Manual actuation excluded from surveillance Notes)
2. Low Pressure Coolant Injection (LPCI) System
   c. Reactor Steam Dome Pressure - Low (Injection Permissive) (Actuation logic excluded from surveillance Notes)
   d. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive) (Actuation logic excluded from surveillance Notes)
   e. Reactor Vessel Shroud Level - Level 0 (Actuation logic excluded from surveillance Notes)
   f. Low Pressure Coolant Injection Pump Start - Time Delay Relay
   Pumps A,B,D (Permissive or interlock excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)
   Pump C (Permissive or interlock excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)
   h. Manual Initiation (Manual actuation excluded from surveillance Notes)
3. High Pressure Coolant Injection (HPCI) System
   g. Manual Initiation (Manual actuation excluded from surveillance Notes)

4. Automatic Depressurization System (ADS) Trip System A
   c. Automatic Depressurization System Initiation Timer (Actuation logic excluded from surveillance Notes)
   e. Core Spray Pump Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
   f. Low Pressure Coolant Injection Pump Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
   g. Automatic Depressurization System Low Water Level Actuation Timer (Actuation logic excluded from surveillance Notes)
   h. Manual Initiation (Manual actuation excluded from surveillance Notes)
5. ADS Trip System B
   c. Automatic Depressurization System Initiation Timer (Actuation logic excluded from surveillance Notes)
   e. Core Spray Pump Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
   f. Low Pressure Coolant Injection Pump Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
   g. Automatic Depressurization System Low Water Level Actuation Timer (Actuation logic excluded from surveillance Notes)
   h. Manual Initiation (Manual actuation excluded from surveillance Notes)

Table 3.3.5.2-1, "Reactor Core Isolation Cooling System Instrumentation" Functions
5. Manual Initiation (Manual actuation excluded from surveillance Notes)

BWR/6 Plants (NUREG-1434) Instrumentation Functions Annotated with Surveillance Notes

Table 3.3.1.1-1, "Reactor Protection System Instrumentation" Functions
1. Intermediate Range Monitors
   a. Neutron Flux – High
2. Average Power Range Monitors
   a. Neutron Flux - High, Setdown
   b. Flow Biased Simulated Thermal Power - High
   c. Fixed Neutron Flux - High
3. Reactor Vessel Steam Dome Pressure - High
4. Reactor Vessel Water Level - Low, Level 3
5. Reactor Vessel Water Level - High, Level 8
7. Drywell Pressure - High
8. Scram Discharge Volume Water Level - High
   a. Transmitter/Trip Unit
9. Turbine Stop Valve Closure, Trip Oil Pressure - Low
10. Turbine Control Valve Fast Closure, Trip Oil Pressure – Low (if mechanical device is used then exempt from surveillance Notes)

Table 3.3.2.1-1, "Control Rod Block Instrumentation" Functions
1. Rod Pattern Control System
   a. Rod withdrawal limiter

Table 3.3.4.1-1, "EOC-RPT Instrumentation" Functions
1. Trip Units
2. Turbine Stop Valve Closure, Trip Oil Pressure – Low (if mechanical device is used then

exempt from surveillance Notes)
3. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low

Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation" Functions
1. Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems
   a. Reactor Vessel Water Level - Low Low Low, Level 1
   b. Drywell Pressure – High
2. LPCI B and LPCI C Subsystems
   a. Reactor Vessel Water Level - Low Low Low, Level 1
   b. Drywell Pressure - High
3. High Pressure Core Spray (HPCS) System
   a. Reactor Vessel Water Level - Low Low, Level 2
   b. Drywell Pressure - High
   c. Reactor Vessel Water Level - High, Level 8 (Optional to include surveillance Notes or not)
   d. Condensate Storage Tank Level – Low (If mechanical device, excluded from surveillance Notes)
   e. Suppression Pool Water Level – High (If mechanical device, excluded from surveillance Notes)
   f. HPCS Pump Discharge Pressure - High (Bypass) (If mechanical device, excluded from surveillance Notes) (If valve locked open, Function can be removed from TS)
   g. HPCS System Flow Rate - Low (Bypass) (If mechanical device, excluded from surveillance Notes) (If valve locked open, Function can be removed from TS)
4. Automatic Depressurization System (ADS) Trip System A
   a. Reactor Vessel Water Level - Low Low Low, Level 1
   b. Drywell Pressure - High
   d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)
5. ADS Trip System B
   a. Reactor Vessel Water Level - Low Low Low, Level 1
   b. Drywell Pressure - High
   d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)

Table 3.3.5.2-1, "Reactor Core Isolation Cooling System Instrumentation" Functions
1. Reactor Vessel Water Level - Low Low, Level 2
2. Reactor Vessel Water Level - High, Level 8 (Optional to include surveillance Notes or not)
3. Condensate Storage Tank Level - Low (If mechanical device, excluded from surveillance Notes)
4. Suppression Pool Water Level - High (If mechanical device, excluded from surveillance Notes)

Table 3.3.6.5-1, "Relief and Low-Low Set (LLS) Instrumentation" Functions
1. Trip Unit
2. Relief Function
   a. Low
   b. Medium
   c. High
3. LLS Function
   a. Low (open and close)
   b. Medium (open and close)
   c. High (open and close)

BWR/6 Plants (NUREG-1434) Instrumentation Functions Excluded From Surveillance Notes

Table 3.3.1.1-1, "Reactor Protection System Instrumentation" Functions

1. Intermediate Range Monitors
   b. Inop (Interlock excluded from surveillance Notes)
2. Average Power Range Monitors
   d. Inop (Interlock excluded from surveillance Notes)
6. Main Steam Isolation Valve - Closure (Mechanical component excluded from surveillance Notes)
8. Scram Discharge Volume Water Level - High
   b. Float Switch (Mechanical component excluded from surveillance Notes)
11. Reactor Mode Switch - Shutdown Position (Manual actuation excluded from surveillance Notes)
12. Manual Scram (Manual actuation excluded from surveillance Notes)

Table 3.3.2.1-1, "Control Rod Block Instrumentation" Functions

1. Rod Pattern Control System
   b. Rod pattern controller (Not part of RPS or ECCS excluded from surveillance Notes)
2. Reactor Mode Switch - Shutdown Position (Manual actuation excluded from surveillance Notes)

Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation" Functions

1. Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems
   c. LPCI Pump A Start - Time Delay Relay (Permissive or interlock excluded from surveillance Notes if it derives input from a sensor or adjustable device that is tested as part of another TS function.)
   d. Reactor Steam Dome Pressure - Low (Injection Permissive) (Actuation logic excluded from surveillance Notes)
   e. LPCS Pump Discharge Flow - Low (Bypass) (Actuation logic excluded from surveillance Notes)
   f. LPCI Pump A Discharge Flow - Low (Bypass) (Actuation logic excluded from surveillance Notes)
   g. Manual Initiation (Manual actuation excluded from surveillance Notes)
2. LPCI B and LPCI C Subsystems
   c. LPCI Pump B Start - Time Delay Relay (Permissive or interlock excluded from surveillance Notes)
   d. Reactor Steam Dome Pressure - Low (Injection Permissive) (Actuation logic excluded from surveillance Notes)
   e. LPCI Pump B and LPCI Pump C Discharge Flow - Low (Bypass) (Actuation logic excluded from surveillance Notes)
   f. Manual Initiation (Manual actuation excluded from surveillance Notes)
3. High Pressure Core Spray (HPCS) System
   h. Manual Initiation (Manual actuation excluded from surveillance Notes)
4. Automatic Depressurization System (ADS) Trip System A
   c. ADS Initiation Timer (Actuation logic excluded from surveillance Notes)
   e. LPCS Pump Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
   f. LPCI Pump A Discharge Pressure – High (Actuation logic excluded from surveillance Notes)

g. ADS Bypass Timer (High Drywell Pressure) (Actuation logic excluded from surveillance Notes)
h. Manual Initiation (Manual actuation excluded from surveillance Notes)

5. ADS Trip System B
c. ADS Initiation Timer (Actuation logic excluded from surveillance Notes)
e. LPCI Pumps B & C Discharge Pressure – High (Actuation logic excluded from surveillance Notes)
f. ADS Bypass Timer (High Drywell Pressure) (Actuation logic excluded from surveillance Notes)
g. Manual Initiation (Manual actuation excluded from surveillance Notes)

<u>Table 3.3.5.2-1, "Reactor Core Isolation Cooling System Instrumentation" Functions</u>

5. Manual Initiation (Manual actuation excluded from surveillance Notes)

ATTACHMENT 3

SUMMARY CALCULATIONS FOR THE REVISED SETPOINTS

Attachment 3 describes the calculation basis for the LTSP, NTSP, AV, AFT band, and ALT band for changed instrumentation function setpoints. Summary calculations are provided for the revised setpoints. {NOTE: If multiple similar setpoints are proposed to be revised, the licensee may provide a summary calculation for each type of setpoint being revised provided that the amendment request contains a reasoned quantitative or qualitative analysis, as appropriate, of how the summary calculation(s) represent the type of setpoint values proposed to be changed.}

MODEL SAFETY EVALUATION FOR PLANT-SPECIFIC ADOPTION OF TSTF TRAVELER TSTF-493, REVISION 4, "CLARIFY APPLICATION OF SETPOINT METHODOLOGY FOR LSSS FUNCTIONS," OPTION A, ADDITION OF SURVEILLANCE NOTES

1.0 INTRODUCTION

{REVIEWER'S NOTE: Throughout this safety evaluation (SE) the term "Limiting Trip Setpoint (LTSP)" refers to the calculated limiting setpoint setting based on vendor-specific setpoint methodologies for Babcock and Wilcox, Combustion Engineering, General Electric Boiling Water Reactor (BWR)/4 and BWR/6 plants, (corresponding to Standard Technical Specification NUREGs-1430, 1432, 1433, and 1434). The term "Nominal Trip Setpoint (NTSP)" is the LTSP with margin added. This SE is written for plants using "LTSP." For Westinghouse plants (corresponding to STS NUREG-1431), the calculated limiting setpoint setting based on vendor-specific methodology is "Nominal Trip Setpoint (NTSP)." Using this convention, an SE for a NUREG-1431 plant would replace "Limiting Trip Setpoint" or "LTSP" with "Nominal Trip Setpoint" or "NTSP" as appropriate and would replace "Nominal Trip Setpoint" or "NTSP" with "field setting." For plants using other terminology, the terms in this SE may be replaced with like terms consistent with the plant-specific setpoint methodology and conforming changes should be made to TSs and TS Bases.}

By letter dated [DATE], [LICENSEE] (the licensee) proposed changes to the Technical Specifications (TSs) for [PLANT]. The proposed changes would revise TSs for applicable instrumentation associated with the Functions listed in Attachment A to Technical Specifications Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS [limiting safety system settings] Functions," to address instrumentation limiting condition for operation issues that could occur during periodic testing and calibration of instrumentation.

The proposed change will resolve operability determination issues associated with potentially non-conservative TSs Allowable Values (AVs)[1] calculated using some methods in the industry standard ISA-S67.04-1994 Part 2, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation." The concern is that when these values are used to assess instrument channel performance during testing, non-conservative decisions about the equipment operability may result. In addition the proposed change will resolve operability determination issues related to relying on AVs associated with TSs Limiting Safety System Settings (LSSSs)[2] to ensure that TSs requirements, not plant procedures, will be used for assessing instrument channel operability.

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1 The instrument setting "Allowable Value" is a limiting value of an instrument's as-found trip setting used during surveillances. The AV is more conservative than the Analytical Limit (AL) to account for applicable instrument measurement errors consistent with the plant-specific setpoint methodology. If during testing, the actual instrumentation setting is less conservative than the AV, the channel is declared inoperable and actions must be taken consistent with the TS requirements.

2 10 CFR 50.36(c)(1(II)(a) states: "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions."

Attachment A contains Functions related to those variables that have a significant safety function as defined in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(1)(ii)(A).

The licensee stated that the application is consistent with Option A of NRC-approved Revision 4 to TSTF-493. [Discuss any differences with TSTF-493, Revision 4.] The availability of this TS improvement was announced in the *Federal Register* on [DATE] ([ ] FR [ ]).

The proposed change would revise the [PLANT] TSs to be consistent with the NRC-approved TSTF-493, Revision 4, Option A. Under Option A two surveillance Notes would be added to [surveillance requirements (SRs) in the Surveillance Requirement Column of TSs Instrumentation Function Tables.] [{REVIEWER'S NOTE: Use only if a specification does not include a Functions Table}[the applicable SRs.] Specifically, surveillance Notes would be added to SRs that require verifying trip setpoint setting values, i.e., [{REVIEWER'S NOTE: use only for NUREG-1430, 1432, 1433, and 1434 plants} channel calibration and channel functional test SRs.] [{REVIEWER'S NOTE: use only for NUREG-1431 plants} channel calibration, channel operational test, and trip actuating device operational test SRs.] The list of affected instrument Functions are in Attachment 2 to the license amendment request (LAR). This list includes instrument Functions in the limiting conditions for operation (LCOs) for the [list appropriate LCOs].

For instrument Functions not required to have the surveillance Notes described above or for Functions in other instrumentation TSs not described above, TSTF-493, Revision 4, Option A, revised the TS Bases for SRs which verify setpoint setting values to state that the required surveillance ensures that the instruments are functioning as required. The TS Bases state: "There is a plant-specific program which verifies that the instrument channel(s) will function as required by verifying the as-left setting and as-found trip values are consistent with those established by the setpoint methodology."

The regulatory basis for the proposed TS changes is described in Section 2.0 of this SE. The technical evaluation, including the approach used to assess the instrumentation methodology, is discussed in Section 3.0 of this SE.

2.0 REGULATORY EVALUATION

Plant protective systems are designed to initiate reactor trips (scrams) or other protective actions before selected unit parameters exceed ALs assumed in the safety analysis in order to prevent violation of the reactor core safety limits (SLs) and the reactor coolant system (RCS) pressure SL from postulated AOOs and to assist the engineered safety features (ESF) systems in mitigating accidents. The reactor core SLs and the RCS pressure SL ensure that the integrity of the reactor core and RCS is maintained. The design criteria for instrumentation used by this evaluation are:

The regulation at 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 13, Instrumentation and control, states:

> Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated

systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

The regulation at 10 CFR Part 50, Appendix A, GDC 20, Protection system functions, states:

> The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

The Commission's regulatory requirements related to the content of the TS are contained in 10 CFR 50.36. The regulation at 10 CFR 50.36 requires applicants for nuclear power plant operating licenses to include TS as part of the license. The regulation requires, in part, that the TS include items in the following categories: (1) Safety limits, limiting safety systems settings, and limiting control settings; (2) Limiting conditions for operation; (3) Surveillance requirements; (4) Design features; and (5) Administrative controls. However, the regulation does not specify the particular requirements to be included in TSs

Instrumentation required by the TSs has been designed to assure that the applicable safety analysis limits will not be exceeded during accidents and AOOs. This is achieved by specifying the LTSPs, including testing requirements to assure the necessary quality of systems, in terms of parameters directly monitored by the applicable instrumentation systems for LSSSs, as well as specifying LCOs on other plant parameters and equipment in accordance with 10 CFR 50.36(c)(2).

- Section 50.36(c)(1)(i)(A) states in part:

  > Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity.

- Section 50.36(c)(1)(ii)(A) states in part:

  > Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor.

- Section 50.36(c)(2) states in part:

  > Limiting conditions for operation. Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

- Section 50.36(c)(3) states in part:

  > Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

- Section 50.36(c)(5), states in part:

  > Administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure the operation of the facility in a safe manner.

In addition to the regulatory requirements stated above, the NRC staff also considered the previously approved guidance in {REVIEWER'S NOTE: choose the NUREG citation that pertains to the LAR: [NUREG–1430, Revision 3, ''Standard Technical Specifications, Babcock and Wilcox Plants,'' June 2004][NUREG–1431, Revision 3, ''Standard Technical Specifications, Westinghouse Plants,'' dated June 2004] [NUREG–1432, Revision 3, ''Standard Technical Specifications, Combustion Engineering Plants,'' dated June 2004][NUREG-1433, Revision 3, "Standard Technical Specifications, General Electric Plants, BWR/4," dated June 2004][NUREG-1434, Revision 3, "Standard Technical Specifications, General Electric Plants, BWR/6," dated June 2004]}, and [Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," for determining the acceptability of revising instrumentation TS requirements. RG 1.105, Revision 3, describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits. The RG endorses Part 1 of ISA-S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation," subject to NRC staff clarifications. The ISA standard provides a basis for establishing setpoints for nuclear instrumentation for safety systems and addresses known contributing errors in the channel. Part 1 establishes a framework for ensuring that setpoints for nuclear safety-related instrumentation are established and maintained within specified limits.]

3.0 TECHNICAL EVALUATION

3.1 Background

3.1.1 Limiting Trip Setpoints

The licensee added the term Limiting Trip Setpoint (LTSP) as terminology for the setpoint value calculated by means of the plant-specific setpoint methodology documented in [the FSAR][insert the name of a document incorporated by reference into the FSAR.]

The licensee stated that the LTSP is more conservative than the AV and is the least conservative value to which the instrument channel is adjusted following surveillance testing. The LTSP is the limiting setting for the channel trip setpoint considering all credible instrument errors associated with the instrument channel. The LTSP is the least conservative value (with an ALT) to which the channel must be reset at the conclusion of periodic testing to ensure that the AL will not be exceeded during an anticipated operational occurrence (AOO) or accident before the next periodic surveillance or calibration. It is impossible to set a physical instrument channel to an exact value, so a calibration tolerance is established around the LTSP. Therefore, the LTSP adjustment is considered successful if the as-left instrument setting is within the ALT

(i.e., a range of values around the LTSP). The NTSP is the LTSP with margin added. The NTSP is equal to or more conservative than the LTSP.

The AV may still be the only value included in the TSs to indicate the least conservative value that the as-found trip point may have during testing for the channel to be operable. In this case the LTSP values in the facility FSAR or any document incorporated into the FSAR by reference, and the title of this document are identified in surveillance Note 2 in order to satisfy the 10 CFR 50.36 requirements that the LSSS be in the TSs. Additionally, to ensure proper use of the AV, LTSP, and NTSP, the methodology for calculating the as-left and as-found tolerances must also be included in [the FSAR][a document incorporated by reference in the FSAR] and listed in surveillance Note 2 as discussed in Section 3.1.2, below.

3.1.2 Addition of Surveillance Notes to TS Functions

Setpoint calculations calculate an LTSP based on the AL of the Safety Analysis to ensure that trips or protective actions will occur prior to exceeding the process parameter value assumed by the Safety Analysis calculations. These setpoint calculations may also calculate an allowable limit of change to be expected (i.e., the AFT) between performance of the surveillance tests for assessing the value of the setpoint setting. The least conservative as-found instrument setting value that a channel can have during calibration without requiring performance of a TS remedial action is the setpoint AV. Discovering an instrument setting to be less conservative than the AV indicates that there may not be sufficient margin between the LTSP setting and the AL. Technical Specifications [{REVIEWER'S NOTE: use only for NUREG-1430, 1432, 1433, and 1434 plants} channel calibrations, channel functional tests (with setpoint verification),] [{REVIEWER'S NOTE: use only for NUREG-1431 plants} trip unit calibrations, channel operational tests, and trip actuating device operational tests (with setpoint verification),] are performed to verify channels are operating within the assumptions of the setpoint methodology used to calculate the LTSP and that channel settings have not exceeded the TS AVs. When the measured as-found setpoint is non-conservative with respect to the AV, the channel is inoperable and the actions identified in the TSs must be taken.

<u>Surveillance Note 1</u>

Surveillance Note 1 states, "If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service."

This Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its AFT but conservative with respect to the AV. Evaluation of channel performance will verify that the channel will continue to function in accordance with safety analysis assumptions and the channel performance assumptions in the [PLANT] setpoint methodology and establishes a high confidence of acceptable channel performance in the future. Because the AFT allows for both conservative and non-conservative deviation from the LTSP, changes in channel performance that are conservative with respect to the LTSP will also be detected and evaluated for possible effects on expected performance. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the channels will be evaluated under the [PLANT] Corrective Action Program (CAP). Entry into the CAP will ensure required review and documentation of the condition to establish a reasonable expectation for continued operability.

Verifying that a trip setting is conservative with respect to the AV when a surveillance is performed does not by itself verify the instrument channel will operate properly in the future because setpoint drift is a concern. Although the channel was operable during the previous surveillance interval, if it is discovered that channel performance is outside the performance predicted by the plant setpoint calculations for the test interval, then the design basis for the channel may not be met, and proper operation of the channel for a future demand cannot be assured. Surveillance Note 1 formalizes the establishment of the appropriate AFT for each channel. This AFT is applied about the LTSP or about any other more conservative NTSP. The as-found setting tolerance ensures that channel operation is consistent with the assumptions or design inputs used in the setpoint calculations and establishes a high confidence of acceptable channel performance in the future. Because the setting tolerance allows for both conservative and non-conservative deviation from the LTSP, changes in channel performance that are conservative with respect to the LTSP will also be detected and evaluated for possible effects on expected performance.

Implementation of surveillance Note 1 requires the licensee to calculate an AFT. The licensee calculated the AFT using [the Square Root Sum of the Squares (SRSS) combination of either a) reference accuracy (RA), measurement and test equipment (M&TE) error including readability (Rd), and projected drift; or b) ALT and the projected drift (assuming that ALT is less than the SRSS combination of RA, and M&TE error, including Rd)]. {REVIEWER'S NOTE: Different methods for calculating the AFT, including using additional uncertainties (e.g., normal radiation effect, temperature effect between calibrations, capillary tubing error) may be acceptable. Alternate methods must result in an AFT that is small enough to detect abnormal channel performance.}

Surveillance Note 2

Surveillance Note 2 states:

> The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Limiting Trip Setpoint (LTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (Nominal Trip Setpoint) to confirm channel performance. The Limiting Trip Setpoint and the methodologies used to determine the as-found and as-left tolerances are specified in the [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference.]

{REVIEWER'S NOTE: Instead of referencing the name of the document that contains the LTSPs in surveillance Note 2, it is also acceptable to list the LTSPs] directly in the TSs, and revise surveillance Note 2 to identify only the title of the document that describes the methodology for determining the as-found and as-left tolerances.}

{REVIEWER'S NOTE: For TSs with a multiple column format which lists the LTSP (as shown as an option to list the NTSP in NUREG-1431), the last sentence of surveillance Note 2 is modified to remove the requirement that the LTSP be identified in the FSAR or a document incorporated by reference in the FSAR. If the LTSP is specified in the TSs, any change to the LTSP requires prior NRC review and approval. It will still be necessary to identify the methodologies used to determine the as-found and the as-left tolerances in the FSAR or in a document incorporated by reference into the FSAR and identify this document in surveillance

Note 2.}

The second surveillance Note requires that the as-left setting for the channel be returned to within the ALT of the LTSP. Where a setpoint more conservative than the LTSP is used in the plant surveillance procedures, the ALT and AFT, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit (SL) and AL is maintained. If the as-left channel setting cannot be returned to a setting within the ALT of the LTSP, then the channel would be declared inoperable. The second surveillance Note also requires that the LTSP and the methodologies for calculating the ALT and the AFT be included in the [insert the facility FSAR reference or any document incorporated into the facility FSAR by reference].[3]

The measured trip point is verified to be within the AFT by [calculating the difference between the current as-found value and the LTSP.] {REVIEWER'S NOTE: In order for licensees to use the as-found minus LTSP methodology, the ALT must be less than or equal to the SRSS combination of the RA, and M&TE, including Rd.} The methodology used to determine the as-found and as-left tolerance is in [the FSAR][a document incorporated by reference in the FSAR] and is referenced in surveillance Note 2, as described above.

To implement surveillance Note 2 the ALT for some instrumentation Function channels is established to ensure that realistic values are used that do not mask instrument performance. The licensee stated that setpoint calculations assume that the instrument setpoint is left at the LTSP within a specific ALT (e.g., 25 psig ± 2 psig). A Tolerance is necessary because it is not possible to read and adjust a setting to an absolute value due to the readability and/or accuracy of the test instruments or the ability to adjust potentiometers. The licensee stated that the ALT is normally as small as possible considering the tools and the objective to meet an as low as reasonably achievable calibration setting of the instruments. The ALT is considered in the setpoint calculation. Failure to set the actual plant trip setpoint to the LTSP and within the ALT would invalidate the assumptions in the setpoint calculation because any subsequent instrument drift would not start from the expected as-left setpoint.

[Implementation of surveillance Note 2 required recalculation of the ALT for some channels to ensure that realistic values are used that do not mask instrument performance. ALT much larger than necessary for proper reading and adjustment of the channels could prevent or mask detection of instrument degradation or failure, and therefore should be avoided.

Functions Not Annotated with Surveillance Notes

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3 In NUREGs-1430, 1432, 1433, and 1434, Revision 3, the TS Function tables contain AVs. These specifications are referred to as having the "single column" format. Plants that specify the LTSP instead of the AV, are not required to incorporate the LTSP value in the last sentence in Note 2 because any change to the value requires prior NRC review and the values cannot be changed by the licensee under 10 CFR 50.59. In NUREG-1431, Revision 3, the option is given to list only the AV or to list the AV and the NTSP. This two column format is referred to as the "multiple columns" format; for the multiple column presentation, the NTSP is the LSSS. Those plants that utilize the "multiple column" format are not required to incorporate the NTSP value in the last sentence in Note 2 because any change to the value requires prior NRC review and the values cannot be changed by the licensee under 10 CFR 50.59. For NUREG-1431 plants that specify a single column AV, identification of the NTSP in the last sentence in Note 2 is required.

TSTF-493, Revision 4, Option A, as adopted by the licensee, stated that for Functions not being given the two surveillance Notes, the TS Bases are revised to reflect that a determination that the instrument is functioning as required will be performed prior to returning the channel to service when the channel is found conservative with respect to the AV but outside the predefined tolerance (AFT). This determination considers whether the instrument is degraded or is capable of being reset and performing its specified safety function. If the channel is determined to be functioning as required (i.e., the channel can be adjusted to within the ALT and is determined to be functioning normally based on the determination performed prior to returning the channel to service), then the channel is Operable and can be restored to service. The licensee enters the as-found setting values condition into the CAP for further analysis and trending.

3.1.3 Evaluation of Exclusion Criteria

Exclusion criteria are used to determine which Functions do not need to receive the additional surveillance test requirements. Instruments are excluded from the additional requirements when their functional purpose can be described as (1) a manual actuation circuit, (2) an automatic actuation logic circuit, or (3) an instrument function that derives input from contacts which have no associated sensor or adjustable device. Many permissives or interlocks are excluded if they derive input from a sensor or adjustable device that is tested as part of another TS function. The list of affected Functions in Attachment 2 of the LAR was developed by the licensee on the principle that all Functions in the affected TSs are included unless one or more of the exclusions that follow apply. In general, [the licensee] excluded the following functions from additional surveillance testing requirements applied as surveillance Notes:

1. The two surveillance Notes are not applied to Functions which utilize manual actuation circuits, automatic actuation logic circuits, or to instrument functions that derive input from contacts which have no associated sensor or adjustable device (i.e., limit switches, breaker position switches, manual actuation switches, float switches, proximity detectors, etc.). In addition, the two surveillance Notes do not apply to those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function.

The two surveillance Notes are not applied to Functions which utilize mechanical components to sense the trip setpoint, or to manual initiation circuits (the latter are not explicitly modeled in the accident analysis) because current functional SRs, which have no setpoint verifications, adequately demonstrate the operability of these Functions. Surveillance Note 1 requires a comparison of the periodic SR results to provide an indication of channel (or individual device) performance. This comparison is not valid for most mechanical components. While it is possible to verify that a limit switch perform its function at a point of travel, a change in the surveillance result is likely caused by the mechanical properties of the limit switch, for example, not that the input/output relationship has changed. Therefore, a comparison of SR results would not provide an indication of the channel or component performance.

2. The two surveillance Notes are not applied to TSs associated with mechanically operated safety relief valves. The performance of these components is already controlled (i.e., trended with as-left and as-found tolerances) under the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants testing program.

3. The two surveillance Notes are not normally applied to Functions and SRs, which test only digital components. Digital components, such as actuation logic circuits, relays, and

input/output modules are not expected to exhibit drift characteristics; therefore, a change in result between surveillances or any test result other than the identified TS surveillance acceptance criteria would cause the digital component to be declared inoperable. However, where separate as-left and as-found tolerances are established for digital component SRs, the Note requirements would apply.

3.2 Technical Evaluation

{REVIEWER'S NOTE: The plant-specific SE discussion may deviate from this generic evaluation due to the scope and content of the licensee plant-specific license basis.}

{REVIEWER'S NOTE: Section 3.2.1 is applicable only for adoption of TSTF-493 Option A with changes to setpoint values}

[3.2.1 Changes to the Setting Limits

The licensee proposed changes to the following TSs instrument setting limits: [list functions.] The licensee demonstrated the calculation basis for the LTSP, NTSP, AV, AFT band, and ALT band for a representative sample of each type of automatic protection instrumentation function.

{REVIEWER'S NOTE: Insert a summary description, detailing the extent of the NRC staff review and any requests for additional information issued by the NRC staff, addressing any NRC staff request that resulted in modification of the application with a supplemental letter, and describe the NRC staff's basis for accepting the modifications.}

Since these settings are calculated based on an acceptable methodology, they are acceptable to the NRC staff.

3.2.[2] Addition of Surveillance Notes to TS Functions

The licensee has added surveillance Notes to the following TS instrumentation specifications: [insert list of Instrumentation LCOs]. The licensee stated that the determination to include surveillance Notes for specific Functions in these TS Tables is based on these functions being automatic protective devices related to variables having significant safety functions as delineated by 10 CFR 50.36(c)(1)(ii)(A). Furthermore, the licensee stated that if during calibration testing the setpoint is found to be conservative with respect to the AV but outside its predefined AFT band, then the channel shall be brought back to within its predefined calibration tolerance before returning the channel to service. The calibration tolerances are specified in [the facility FSAR][a document incorporated by reference in the FSAR]. Changes to these values will be controlled by 10 CFR 50.59. The licensee has applied surveillance Notes to the following functions in the following TS Tables:

{REVIEWER'S NOTE: insert the list of instrument Functions in their respective TS Tables that will be modified with the two Option A surveillance Notes.}

The proposed surveillance notes will add the requirement to address operability of the subject functions in the TS as discussed in TSTF-493, Revision 4, Option A. The NRC staff reviewed the list of affected TS functions. [Insert a summary description, detailing the extent of the NRC staff review and any requests for additional information issued by the NRC staff, addressing any NRC staff request that resulted in modification of the application with a

supplemental letter and describe the NRC staff's basis for accepting the modifications.] The NRC staff finds the licensee's proposed change acceptable.

3.2.[3] Evaluation

{REVIEWER'S NOTE: Use this paragraph if the demonstration is sufficient.} Based on the review of the licensee's application, the NRC staff concludes that the licensee setpoint calculations are consistent with Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," methodology for the proposed TS changes and are therefore acceptable. The addition of surveillance notes to applicable functions ensures instrument Function operability will be controlled in the TS rather than procedures and additional uncertainties have been included in the AFT calculations in a manner that is acceptable to the NRC staff. By establishing the surveillance Note requirements of the TSs the licensee has also demonstrated that there will be a reasonable expectation that these instruments will perform their safety function if required. The NRC staff further concludes that the proposed TS changes meet the requirements of 10 CFR 50.36(c)(1)(ii)(A) and therefore, are acceptable.

4.0 CONCLUSIONS

{REVIEWER'S NOTE: Provide conclusion.}

5.0 STATE CONSULTATION

{REVIEWER'S NOTE: Provide State consultation paragraph.}

6.0 ENVIRONMENTAL CONSIDERATION

{REVIEWER'S NOTE: Provide environmental consideration.}

7.0 REFERENCES

{REVIEWER'S NOTE: Provide list of references.}