ENCLOSURE 2

MFN 14-002

NEDO-33633-A, Revision 1

Non-Proprietary Information– Class I (Public)

IMPORTANT NOTICE

This is a non-proprietary version of NEDE-33633P-A, Revision 1, from which the proprietary information has been removed. Portions of the enclosure that have been removed are indicated by an open and closed bracket as shown here [[ ]].

Note the NRC's Final Safety Evaluation is enclosed in NEDO-33633-A, Revision 1. Portions of the Safety Evaluation that have been removed are indicated with a single square bracket as shown here. [ ].

HITACHI

GE Hitachi Nuclear Energy

NEDO-33633-A
Revision 1
January 2014

Non-Proprietary Information – Class I (Public)

Licensing Topical Report

GEH Methodology for Implementing TSTF-493 Revision 4

INFORMATION NOTICE

This is a non-proprietary version of the document NEDE-33633P-A, Revision 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[ ]].

Within the US NRC Safety Evaluation, the proprietary portions of the document that have been removed are indicated by an open and closed bracket as shown here [ ].

IMPORTANT NOTICE REGARDING CONTENTS OF THIS REPORT PLEASE READ CAREFULLY

The design, engineering, and other information contained in this document is furnished for the purpose of obtaining NRC approval of the GEH Licensing Topical Report, NEDE-33633P, "GEH Methodology for Implementing TSTF-493 Revision 4." The only undertakings of GEH with respect to information in this document are contained in the contracts between GEH and its customers or participating utilities, and nothing contained in this document will be construed as changing that contract. The use of this information by anyone for any purpose other than that for which it is intended is not authorized; and with respect to any unauthorized use, GEH makes no representation or warranty, and assumes no liability as to the completeness, accuracy, or usefulness of the information contained in this document.

November 6, 2013

Mr. Jerald G. Head
Senior Vice President, Regulatory Affairs
General Electric-Hitachi
Nuclear Energy Americas, LLC
P.O. Box 780, M/C A-18
Wilmington, NC 28401-0780

SUBJECT: FINAL SAFETY EVALUATION FOR GENERAL ELECTRIC HITACHI NUCLEAR ENERGY AMERICAS, LLC TOPICAL REPORT NEDE-33633P, "GEH METHODOLOGY FOR IMPLEMENTING TSTF-493 REVISION 4" (TAC NO. ME5760)

Dear Mr. Head:

By letter dated February 23, 2011 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML110560302), GE Hitachi Nuclear Energy Americas, LLC (GEH) submitted Topical Report (TR) NEDE-33633P, "GEH Methodology for Implementing TSTF-493 Revision 4" to the U.S. Nuclear Regulatory Commission (NRC) staff for review.

By letter dated July 2, 2013, an NRC draft safety evaluation (SE) regarding our approval of TR NEDE-33633P was provided for your review and comment (ADAMS Package Accession No. ML13107B502). The NRC staff's disposition of the GEH comments on the draft SE are discussed in the attachment to the final SE enclosed with this letter.

The NRC staff has found that TR NEDE-33633P is acceptable for referencing in licensing applications for nuclear power plants to the extent specified and under the limitations delineated in the TR and in the enclosed final SE. The final SE defines the basis for our acceptance of the TR.

Our acceptance applies only to material provided in the subject TR. We do not intend to repeat our review of the acceptable material described in the TR. When the TR appears as a reference in license applications, our review will ensure that the material presented applies to the specific plant involved. License amendment requests that deviate from this TR will be subject to a plant-specific review in accordance with applicable review standards.

NOTICE: Enclosure 2 transmitted herewith contains Proprietary Information. When separated from Enclosure 2, this transmittal document is decontrolled.

In accordance with the guidance provided on the NRC website, we request that GEH publish approved proprietary and non-proprietary versions of TR NEDE-33633P, within three months of receipt of this letter. The approved versions shall incorporate this letter and the enclosed final SE after the title page. Also, they must contain historical review information, including NRC requests for additional information and your responses. The approved versions shall include an "-A" (designating approved) following the TR identification symbol.

If future changes to the NRC's regulatory requirements affect the acceptability of this TR, GEH and/or licensees referencing it will be expected to revise the TR appropriately, or justify its continued applicability for subsequent referencing.

Sincerely,

/RA by SHelton for/

Sher Bahadur, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 710

Enclosures:
1. Final Safety Evaluation (Non-Proprietary)
2. Final Safety Evaluation (Proprietary)

In accordance with the guidance provided on the NRC website, we request that GEH publish approved proprietary and non-proprietary versions of TR NEDE-33633P, within three months of receipt of this letter. The approved versions shall incorporate this letter and the enclosed final SE after the title page. Also, they must contain historical review information, including NRC requests for additional information and your responses. The approved versions shall include an "-A" (designating approved) following the TR identification symbol.

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Sincerely,

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1. Final Safety Evaluation (Non-Proprietary)
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DISTRIBUTION:
PUBLIC (Cover Letter, Encl. 1, and Att. 1)

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JGolla	SWyman
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ML13255A011 (Package); ML13254A042 (Cover letter); ML13254A025 (Prop SE); ML13275A112 (Prop Attachment); ML13254A029 (Non-Prop SE); ML13254A030 (Non-Prop Attachment) **NRR-106**

OFFICE	PLPB/PM	PLPB/LA	EICB/BC	PLPB/BC	DPR/DD
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DATE	10/9/2013	10/3/2013	10/21/2013	10/24/2013	11/6/2013

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR

REGULATION OF GE HITACHI LICENSING TOPICAL REPORT NEDE-33633P, "LICENSING

TOPICAL REPORT GEH METHODOLOGY FOR

IMPLEMENTING TSTF-493 REVISION 4"

GE-H REFERENCE: MFN 11-028

PROJECT NO. 710

1.0 INTRODUCTION

By letter dated February 23, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110560302) General Electric-Hitachi Nuclear Energy (GEH) submitted a licensing topical report (TR) NEDE-33633P, "Licensing Topical Report GEH Methodology for Implementing TSTF-493 Revision 4," dated February 2011 for U.S. Nuclear Regulatory Commission (NRC) review and approval (GEH Letter Reference MFN 11-028). This TR describes the methodology developed by GEH for calculating the as-found and as-left tolerances (AFT/ALT) for setpoints in boiling water reactor (BWR) plant technical specifications (TS) that comply with the guidance of TSTF-493, Revision 4. GEH states that this TR is applicable for all BWR/2-6 licensees.

In November of 1995, the NRC staff approved the General Electric Report NEDC-31336P, "General Electric Instrument Setpoint Methodology" (Reference NRC Letter dated November 6, 1995, ADAMS Accession No. ML072950103), which documents a methodology and basis for calculating trip setpoints for selected types of BWR protection system setpoints. The TR NEDE-33633P submitted with the February 23, 2011 GEH letter complements the previously approved setpoint methodology GE NEDC-31336P-A (ADAMS Accession No. ML072950103) (the designation "-A" indicates the NRC-approved version) and provides the basis for determining AFT/ALT associated with these calculated trip setpoints. TR NEDE-33633P states that the setpoint calculation methodology used in NEDC-31336P-A (approved) is addressed as "GEH Setpoint Methodology" and remains applicable for determining the TS allowable values (AVs) and related nominal trip setpoints (NTSPs) applicable to operating plants for which the licensee has chosen to implement the approved 1995 GE Setpoint Methodology. This NRC staff safety evaluation (SE) does not address the acceptability of future license amendment requests referencing the GE NEDC-31336P-A methodology for determining trip setpoints, but is limited to an evaluation of the use of the methodology described in TR NEDE-33633P for establishing nominal trip setpoints and calculating AFT/ALT for setpoints in BWR plant TS that are intended to comply with the guidance of TSTF-493, Revision 4.

In Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR [Title 10 of *Code of Federal Regulations*] 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006 (ADAMS Accession No. ML051810077), the NRC expressed concerns that the current operating plant TS requirements for limiting safety system settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, this RIS

discusses issues that could occur during testing of LSSSs and which may have an adverse effect on equipment operability. To address the NRC concerns, the pressurized water reactor (PWR) and BWR Owner's Groups TS Task Force (TSTF) issued the following letters:

1. Transmittal of Revised TSTF-493 Revision 4, TSTF-09-29, dated January 5, 2010 (ADAMS Accession No. ML100060064)

2. Transmittal of TSTF-493 Revision 4, Errata, TSTF-10-07, dated April 23, 2011 (ADAMS Accession No. ML101160026)

The TSTF-493 Revision 4 guidance provides for two notes regarding operability determination that should be placed on specific instrument functions contained within the Standard TS (STS) Surveillance Requirements for instrument channel (loop) and trip unit (if applicable) calibrations. Further, the TSTF-493 Revision 4 guidance provides an acceptable method for identifying the as-left and as-found tolerances that is consistent with RIS 2006-17. TSTF-493 Revision 4 also provides the specific actions to be taken if the as-found channel setpoint is outside either the predefined ALT/AFT.

2.0 REGULATORY REQUIREMENTS

The NRC staff evaluated TR NEDE-33633P against the regulatory requirements and guidance listed below to ascertain whether there is reasonable assurance that the systems and components affected by the TR will perform their required safety functions when called upon to do so.

2.1 Regulatory Requirements

The staff considered the following regulatory requirements:

The regulation of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," establishes the fundamental regulatory requirements. Specifically, Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 provides, in part, that an application for a design certification, combined license, design approval, or manufacturing license, respectively, must include the principal design criteria for a proposed facility. The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

In 10 CFR 50.36, "Technical Specifications," the Commission established its regulatory requirements related to the contents of the TS. Specifically, 10 CFR 50.36 states that "each applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section." Specifically, 10 CFR 50.36(c)(1)(ii)(a) states, "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." Additionally, 10 CFR 50.36(c)(3) states, "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 of operation will be met."

General Design Criterion (GDC) 13, "Instrumentation and Control," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 requires that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges.

GDC 20, "Protection System Functions," of Appendix A to 10 CFR Part 50 requires that the protection system be designed to initiate the operation of appropriate systems to ensure that specified acceptable fuel design limits are not exceeded.

The NRC staff reviewed the proposed TR against these requirements to ensure that there is reasonable assurance that the systems affected by the proposed TR will perform their required safety functions.

2.2 Regulatory Guidance

Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," Revision 3, describes a method that the NRC staff finds acceptable for use in complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within, and will remain within, the TS limits. RG 1.105 endorses Part I of Instrument Society of America (ISA)-S67.04-1994, "Setpoints for Nuclear Safety Instrumentation," which is subject to NRC staff clarifications.

In RIS 2006-17 the NRC addresses requirements on LSSS that are assessed during the periodic testing and calibration of instrumentation.

In a letter dated September 7, 2005, from Patrick L. Hiland (NRC) to the Nuclear Energy Institute's Setpoint Methods Task Force, "Technical Specification for Addressing Issues Related to Setpoint Allowable Values" (ADAMS Accession No. ML052500004), footnotes are described that should be added to surveillance requirements related to setpoint verification for instrument functions on which a safety limit has been placed. This letter also addresses the information that should be included within TS to ensure operability of the instruments following surveillance tests related to instrument setpoints.

2.3 Supplemental Guidance

PWR and BWR Owner's Groups' TSTF-493, Revision 4, dated January 5, 2010 and an errata sheet, dated April 23, 2010, (ADAMS Accession No. ML100060064) addresses staff concerns stated in RIS 2006-17 and Federal Register Notice, "Notice of Availability of the Models for Plant-Specific Adoption of Technical Specifications Task Force Traveler TSTF–493, Revision 4, 'Clarify Application of Setpoint Methodology for LSSS Functions'," Vol. 75, No. 90 / Tuesday, May 11, 2010, documents NRC's position on adoption of TSTF-493, Revision 4.

3.0 TECHNICAL EVALUATION

TR NEDE-33633P states that the GEH TSTF-493 Methodology it contains was developed based on the consideration that previously-approved GEH Instrument Setpoint Methodology remains applicable for determining TS AVs and related NTSPs for operating plants. Therefore, this NRC staff SE does not re-consider or modify the conclusions reached by the NRC staff regarding the previously-approved GE Instrument Setpoint Methodology NEDC-31336P-A (ADAMS Accession No. ML072950103), but simply evaluates the TSTF-493-related aspects of the determination of final NTSPs and as-found/as-left tolerances identified within TR NEDE-33633P.

To implement the GEH TSTF-493 Methodology for new or revised setpoint calculations of operating reactors, the previously-approved GE Instrument Setpoint Methodology in NEDC-31336P-A (referred to henceforth as "GEH Instrument Setpoint Methodology") is first used to establish the following relationships among safety related instrument setpoints:

1. Allowable Value (AV) and Required AV Margin. The Required AV Margin establishes the AV specified in the Technical Specifications with sufficient margin to ensure that there is a high probability that the Analytical Limit will not be exceeded if the as-found value of the instrument setting established by the methodology in NEDC-31336P-A were to be at the AV.

2. First Nominal Trip Setpoint (NTSP1) and Required NTSP Margin, which is equivalent to the Limiting Trip Setpoint (LTSP) described in TSTF-493. The Required NTSP Margin establishes NTSP1 with sufficient margin to ensure there is a high probability that the Analytical Limit will not be exceeded for the limiting event occurring from normal operations, and represents the minimum margin between the NTSP and the analytical limit required by the GE Instrument Setpoint Methodology NEDC-31336P-A.

TR GEH NEDE-33633P provides a methodology for determining the ALT and AFT associated with the criteria established in TSTF-493. The methodology for determining ALT/AFTs addresses aspects of current plant TS, instrument loop configuration, plant surveillance procedures and processes, and the criteria contained in the PWR and BWR Owners Groups TSTF-493 and the NRC RIS 2006-17.

The calculation methodology in NEDE-33633P (henceforth referred to as "GEH TSTF-493 Methodology") is then used to determine the AFT and ALT based on TSTF-493 guidance for instrument performance monitoring and instrument resetting or to confirm that similar margins in the GEH Instrument Setpoint Methodology to NEDC-31336P-A are consistent with limits provided for in the TSTF-493 guidance. The GEH TSTF-493 Methodology is dependent on the instrument loop (channel) configuration **[ ],** and the specific plant procedures used to demonstrate compliance with the TS surveillance requirements for loop and trip unit (if applicable) calibration. The GEH TSTF 493 Methodology to NEDE-33633P only applies to the calculation of the AFT and ALT values for the specific instrument functions identified in TSTF-493, and does not affect the setpoints calculated by GEH Instrument Setpoint Methodology (NEDC-31336P-A).

Specific Requirements and Guidelines Addressed in the Staff's Technical Evaluation

The specific requirement of 10 CFR 50.36 (c)(3)/Regulatory Guide 1.105 being addressed by TSTF-493 Revision 4 to incorporate the NRC staff's position expressed in NRC RIS 2006-17 is to implement appropriate surveillance 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 of operation will be met." Guidance in TSTF-493 Revision 4 that has been endorsed by the NRC staff directs licensees to add two notes to the TS tables associated with instrument channels performing LSSS functions of Reactor Protection System and Engineered Safeguards Features systems identifying the method for performing channel operability determinations during surveillance testing. The operability determination notes are as follows:

1. 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.

2. 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 (NTSP) to confirm channel performance. The LTSP and the methodologies to determine the as-found and the as-left tolerances are specified in [insert the facility FSAR [final safety analysis report] reference or the name of any document incorporated into the facility FSAR by reference].

The NRC staff position regarding the determination of AFT/ALT tolerances is as follows:

1. The AFT is a band around the nominal trip setpoint (or the previous as left setting) of the instrument within which the as-found trip point is expected to fall during a technical specification surveillance of the instrument channel. The band accounts for the uncertainties such as instrument reference accuracy, measuring & test equipment (M&TE), readability, normal environmental effect, and drift of the instrument components which are being tested and accounts only for the uncertainty in loop performance occurring under normal conditions throughout the duration of time occurring between successive surveillance tests.

2. The ALT is the band around the Limiting Trip Setpoint (LTSP) or any value which is more conservative than the LTSP (i.e., the nominal trip setpoint, or NTSP) within which the as-left setpoint must fall at the conclusion of a channel test. The band accounts for the ALT which some licensees define as leeway given to instrument technician or calibration tolerance or setting tolerance. The setting tolerance can be based upon

certain uncertainties such as reference accuracy, M&TE, and readability, but the total loop uncertainty analysis must explicitly account for each of these uncertainty terms no matter whether the setting tolerance incorporates these uncertainties or does not. The setting tolerance may also be an arbitrary value selected on the basis of engineering judgment or other consideration.

The GEH TSTF-493 Methodology addresses this guidance in the following manner:

For an instrument loop that consists only of a single device (e.g., a bistable device, such as a pressure switch or differential pressure switch), the "loop" and trip unit surveillance tests are the same. **[**
]

The AFT is **[** **]**
or the expression:

$AFT_{TSTF} = (A_C^2 + C_{TSTF}^2 + D^2)^{½}$, where:

Ac = Instrument Accuracy
C_{TSTF} = Calibration Error determined using the TSTF-493 methodology, and
D = Instrument Drift

The ALT is the expression:

$ALT_{TSTF} = (A_C^2 + C_{TSTF}^2)^{½}$

[

]

AV = Allowable Value
$NTSP_F$ = Final Nominal Setpoint
[

]

where:

[

]

The NRC staff finds that the TR NEDE-33633P uses methodologies for establishing ALT and AFT that are either consistent with or more conservative than the methodology recommended within the NRC-approved BWR and PWR Owners Group TSTF-493, Revision 4, and is consistent with the NRC staff's guidance in RIS 2006-17. Hence, licensees implementing the methodology specified in the TR would be in compliance with the requirements and guidance addressed in Section 2.0 of this SE.

Conformation to TSTF-493 Notes

NEDE-33633P states that it is anticipated that a licensee's plant-specific license amendment request "will incorporate similar wording" to that as stated in TSTF-493, Revision 4 notes, consistent with their plant-specific TS requirements. The staff has evaluated this statement and it is the NRC staff's understanding that licensees using NEDE-33633P for plant-specific applications will comply with the specific wording requirements as agreed to by the BWR and PWR Owners Groups as depicted in its submittals of April 23, 2010, "TSTF-493, Revision 4, Clarify Application of Setpoint Methodology for LSSS Functions" (ADAMS Accession No. ML101160026) including the notes to be added to the TS setpoint tables, surveillance notes, and TS Bases sections in a manner consistent with the plant licensing basis.

Compatibility with Site Calibration Procedures

The NEDE 33633P states:

> The GEH TSTF-493 methodology for calculating the AFT and ALT [ ] does not require any change to the way the devices are currently calibrated. The GEH TSTF-493 Methodology is compatible with existing plant surveillance procedures for calibration [ ] and is consistent with the guidance in TSTF-493. Licensees implementing the GEH TSTF-493 Methodology only need to ensure that the AFT and ALT in the plant surveillance procedures are consistent with the values calculated using this methodology and that the TS notes are implemented. No other changes to the existing calibration procedures are required.

The NRC staff has evaluated this statement and finds the conditions stipulated as acceptable. The staff notes that in the event that the AFT cannot be accommodated between the existing AV and NTSP, then the NTSP will be adjusted more conservative such that the AFT can be accommodated. Similarly, in the event that the [ ]

cannot be accommodated between the existing AV and NTSP, then the NTSP will be adjusted more conservative such that the **[ ]** can be accommodated.

Application to Other Setpoint Methodologies

As described above, the methodology for calculating the final NTSP and the AFT and ALT **[ ]** described in this TR is based on setpoints that are initially calculated by the GEH Instrument Setpoint Methodology described in GE NEDC 31336P-A. However, the methodology can be applied to AV and NTSPF setpoints determined by another NRC-approved setpoint methodology because the formulation for determining the AFTs and ALTs **[ ]** consists of the statistical combination of the uncertainties consistent with the guidance in TSTF-493, and is not dependent on the methodology used to determine the AV and NTSPF values. Therefore, the setpoint tolerances **[ ]** determined by the GEH TSTF-493 Methodology can be applied to AV and NTSPF values calculated by other NRC-approved setpoint methodologies.

The NRC staff has evaluated this statement and finds the conditions stipulated are acceptable.

4. 0 CONCLUSION

Based on the findings of Section 3.0 of this SE, the NRC staff concludes that, when properly used for compliance with the TSTF-493 operability determination notes in the plant Technical Specifications and the conditions stipulated in Section 3.0 of this SE, the GEH Topical Report NEDE-33633P can be referenced by licensees to describe the licensee determination of AFT and ALT calculations and the relationship between NTSPs and AVs in a manner consistent with the guidelines of BWR and PWR Owners Group TSTF-493, Revision 4 and the NRC requirements specified in Section 2.0 of this SE.

Attachment: Resolution of Comments Table (Non-Proprietary)

Principal Contributor: David Rahn

Date: November 6, 2013

RESOLUTION OF COMMENTS BY THE OFFICE OF NUCLEAR REACTOR REGULATION ON DRAFT SAFETY EVALUATION FOR TOPICAL REPORT NEDE-33633P, REVISION 0, "LICENSING TOPICAL REPORT GE METHODOLOGY FOR IMPLEMENTING TSTF-493 REVISION 4" (TAC NO. ME5760)

Location	Comment	NRC Disposition
Section 1.0 Introduction	Page 1 (line 15) GEH suggests adding "MFN" just before "11-028" and moving the period to be outside of the parenthesis.	Comment accepted. Change made in final SE.
Section 1.0 Introduction	Page 1 (line 30) GEH suggests adding "P" after "NEDE-33633."	Comment accepted. Change made in final SE.
Section 3.0 Technical Evaluation	Page 4 (line 40) Since the instrument setting ($NTSP_F$) and AV are determined by the GEH setpoint methodology and not TSTF methodology in NEDE-33633P (as noted on SER page 5 lines 21 and 22) GEH suggests clarifying by rewording lines 39 through 41 as follows: 39 Analytical Limit will not be exceeded if the as-found value <u>of the instrument setting</u> established by 40 the methodology in <u>NEDC-31336P-A</u> ~~NEDE-33633P of the instrument setting~~ were to be at 41 the AV.	Comment accepted. Change made in final SE.
Section 3.0 Technical Evaluation	Page 5 (lines 3-4, 10-11, and 20-21) Because NEDE-33633P is not used to determine the final adjusted NTSP ($NTSP_F$) (as noted on SER page 5 lines 21 and 22) , GEH suggests deleting portions of the 1st and 2nd paragraphs on Page 5 as shown below: 3 TR GEH NEDE-33633P provides a methodology for determining the ~~"Final"~~ 4 ~~NTSP (NTSPF) and~~ AL T and AFT associated with the criteria established in 5 TSTF-493. The methodology for determining ~~NTSPF and~~	Comment accepted. Changes made in final SE.

ATTACHMENT

	ALT/AFTs addresses 10 The ~~setpoint~~ calculation methodology in NEDE-33633P {henceforth referred to as 11 "GEH TSTF-493 Methodology") is then used to determine the AFT and AL T ~~and~~ 12 ~~NTSPF~~ based on TSTF-493 guidance for instrument performance monitoring and 20 ~~NTSPF and~~ the AFT and AL T values for the specific instrument functions 21 identified in TSTF-493, and does not affect the setpoints calculated by GEH 22 Instrument Setpoint Methodology ~~to~~ (NEDC-31336P-A).	
Entire document	Some of the information provided is considered to be GEH proprietary information. See the attached markup with dotted underline within double square brackets. [[This sentence is an example.{3}]]	The staff agrees with the information identified by GEH as proprietary.
Section 3.0 Technical Evaluation Compatibility with Site Calibration Procedures	Page 8 (lines 38-43) The 2nd paragraph states that: 38 "The staff notes that in the event that the AFT cannot be 39 accommodated between the existing AV and NTSP, then the NTSP will be 40 adjusted more conservative such that the AFT can be accommodated. Similarly, 41 in the event that the **[** **]** cannot be 42 accommodated between the existing AV and NTSP, then the NTSP will be 43 adjusted more conservative such that the **[ ]** can be accommodated." For clarification purposes note that according to GEH TSTF methodology (NEDE-33633P Section 3.3.3 item 2, page 3-9) the AFT is never larger than the AV/$NTSP_F$ margin. This is because AFT is a measure of instrument performance and maintaining a smaller AFT means maintaining a tighter more	Comments accepted. Changes made in final SE.

	conservative margin for monitoring instrument performance. That is why if the AFT calculated by TSTF methodology is larger than the AV/$NTSP_F$ margin, the GEH TSTF methodology conservatively chooses the smaller AV/$NTSP_F$ margin as the AFT. This means that the setpoint can be maintained and no lowering of setpoint is required. If the AFT calculated by TSTF methodology was smaller than the AV/$NTSP_F$ margin then GEH TSTF methodology requires that the AFT be the smaller TSTF AFT, and in this case also no change in setpoint is required. Implementing GEH TSTF methodology does not require any changes to the setpoints determined by setpoint methodology (as noted in SER page 5 Lines 21-22), and is designed to calculate to calculate AFTs and ALTs to be used by the Licensees in the Calibration Procedures (and in the Instrument Performance Monitoring program). GEH suggests re-writing lines 38-43 as follows: The staff notes that in the event that the AFT permitted by TSTF-493 **[** **]** which also maintains the setpoint (NTSPF) at its current value. The GEH TSTF-493 Methodology applies the same approach to AFTs **[** **]** This is acceptable because it means GEH TSTF-493 Methodology applies tighter AFT margins than required by TSTF-493 for instrument performance monitoring which is conservative.	
NEDE-33633P Section 3.0 Last Paragraph Page 3-2	Based on a recent Request for Additional Information (RAI) question for the Columbia ARTS-MELLLA / Power Range Neutron Monitor (PRNM) project, GEH proposes the following clarification to the nomenclature in NEDE-33633P**-A**, as shown below: "In addition to these required margins, the GEH Instrument Setpoint Methodology also provides for margin between the AV and the final nominal trip setpoint ($NTSP_F$). The AV – $NTSP_F$ margin includes all instrument uncertainties under calibration conditions and is provided to reduce the probability that the AV will be exceeded during calibration conditions, and generally results in an $NTSP_F$ that is more conservative than $NTSP_1$. This margin is called the Licensee Event Report (LER) Avoidance Margin ~~(hereafter referred to as the LER Margin)~~. The LER Avoidance Margin provides additional assurance that the AV will	Comment accepted. Changes made in final SE.

	not be exceeded during the required surveillance testing and to demonstrate compliance with the Technical Specifications." Similarly, the use of "LER Margin" will be replaced throughout the document with "LER Avoidance Margin" in the NEDE-33633P**-A** issue. Relevant sections: • 3.2.3 on page 3-5 (3 instances) • 3.3.3 on page 3-10 (2 instances) • Figure 3-1 on page 3-14 (1 instance) The affected pages of NEDE-33633P/NEDO-33633 have been included in Enclosure 3 (proprietary) and Enclosure 4 (non-proprietary).	

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LIST OF FIGURES

ABSTRACT

This Licensing Topical Report (LTR) describes the methodology developed by GEH for calculating as-found and as-left tolerances for setpoints in the BWR plant Technical Specifications that comply with the guidance in TSTF-493 Revision 4. The methodology preserves the significance of the Technical Specification Allowable Values and provides as found and as-left tolerances for evaluating instrument performance during Technical Specification surveillance tests that are consistent with the guidance in TSTF-493. The methodology presented includes a generic approach for developing as-found and as-left tolerances for loop surveillance tests and also for [[

]] Sample calculations [[ ]] are provided to demonstrate the application of the methodology.

REVISIONS

Rev	Purpose of Revision	Reference
0	Initial Issue	--
1	Created '-A' version by adding the NRC's Final Safety Evaluation.	--
	Section 3.0: Last paragraph: Deleted “(hereafter referred to as the LER Margin)” consistent with the last row in the Resolution of Comments on the Draft Safety Evaluation for NEDE-33633P, Revision 0.	--
	Replaced the use of “LER Margin” with “LER Avoidance Margin” in Sections 3.0, 3.2.3, 3.3.3 and in Figure 3-1, consistent with the last row in the Resolution of Comments on the Draft Safety Evaluation for NEDE-33633P, Revision 0.	--
	Revised proprietary marking in Sections 1.3, 3.0, 3.2.2, and 3.3.2.	--

1.0 Introduction

1.1 Objective

This LTR documents the GEH TSTF-493 Methodology to be used to implement the guidance of TSTF-493 Revision 4 (Reference 1) (hereafter referred to as "TSTF-493"). TSTF-493 is applicable to currently operating plants that use the U.S. Nuclear Regulatory Commission (NRC) approved GEH Instrument Setpoint Methodology (Reference 2) with respect to setpoint calculations. The methodology discussed in this LTR is consistent with the guidance of TSTF-493. TSTF-493 was issued by the Technical Specification Task Force (TSTF) and endorsed by the Nuclear Regulatory Commission (NRC) as revised Standard Technical Specifications for BWR/4s (Reference 3) and BWR/6s (Reference 4). TSTF-493 addresses NRC concerns that the current operating plant Technical Specification requirements for Limiting Safety System Settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the NRC is concerned that the existing Surveillance Requirements do not provide adequate assurance that instruments will actuate safety functions by the point assumed in the applicable safety analysis.

1.2 TSTF-493 Guidance

The TSTF-493 guidance provides two Notes that should be placed on specific instrument functions contained within the Standard Technical Specifications Surveillance Requirements for instrument channel (loop) and trip unit (if applicable) calibrations. Further, the TSTF-493 guidance provides an acceptable method for identifying the as-left and as-found tolerances that is consistent with NRC Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels" (Reference 5). TSTF-493 also provides the specific actions to be taken if the as-found channel setpoint is outside either the predefined as-left or as-found tolerance.

1.3 GEH TSTF-493 Methodology Considerations

The GEH TSTF-493 Methodology was developed based on the following considerations to implement the guidance of TSTF-493 as it applies to the approved GEH Instrument Setpoint Methodology:

1. The approved GEH Instrument Setpoint Methodology remains applicable for determining the Technical Specification Allowable Values (AVs) and related Nominal Trip Setpoints (NTSPs) for operating plants.
2. A methodology for determining as-found and as-left tolerances, consistent with or more conservative than the TSTF-493 Standard Technical Specification Notes, is required in addition to the GEH Instrument Setpoint Methodology.
3. The GEH TSTF-493 Methodology must consider current instrument channel (loop) configurations. These configurations include [[
]]

4. The GEH TSTF-493 Methodology must be compatible with the current plant surveillance procedures for device calibration.
5. The plant Technical Specifications, including any changes to implement TSTF-493, are followed. The changes to incorporate TSTF-493 include the addition of the Notes to the Technical Specification surveillance tests for applicable instrument setpoint functions.

2.0 TSTF-493 Guidance

The specific guidance for the implementation of TSTF-493 is to add two Notes to specific instrument "functions" in the improved Standard Technical Specifications. For GEH BWR Standard Technical Specifications, the Notes are typically applied to the Technical Specification Surveillance Requirements for the calibration of the entire instrument loop and the trip units for the loop, if applicable.

The two TSTF–493 Notes are shown below. Note 1 is taken directly from the TSTF guidance, and Note 2 has been modified only to reflect the terminology used for the implemented setpoint (or Final Nominal Trip Setpoint ($NTSP_F$)) in the GEH TSTF-493 Methodology:

1. 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.
2. The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the $NTSP_F$ at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the $NTSP_F$ are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance Procedures to confirm channel performance. The methodology to determine the $NTSP_F$ and the methodologies used to determine the as-found and the as-left tolerances are specified in [facility FSAR or the other document incorporated into the facility FSAR by reference].

It is anticipated that a Licensee's plant-specific License Amendment Request will incorporate similar wording, consistent with their plant-specific Technical Specification requirements.

TSTF-493 guidance states that during the process of checking the setpoint, consistent with the two Notes, there are four possible results in best case to worst case order:

1. "The setpoint is found within the as-left tolerance; the results are recorded in the procedure, and the Technical Specifications require no further action.
2. "The setpoint is outside the as-left tolerance but within the as-found tolerance; the setpoint is reset to within the as-left tolerance, and the Technical Specifications require no further action.
3. "The setpoint is found conservative with respect to the Allowable Value but outside the as-found tolerance. In this case the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the [NTSP or LTSP] (within the allowed tolerance), and evaluating the channel response. If the channel is functioning as required and expected to pass the next surveillance, then the channel is Operable and can be restored to service at the completion of the surveillance.

4. "The setpoint is found non-conservative to the Allowable Value; the channel is inoperable until the setpoint is reset to the [NTSP or LTSP] (within the as-left tolerance), and any evaluations necessary to return the channel to service are completed."

With respect to the guidance for determining the specific as-left and as-found tolerances, TSTF-493 states:

> "Implementation of Note 1 requires the licensee to calculate an as-found tolerance. One acceptable method of calculating the as-found tolerance is the Square Root Sum of the Squares (SRSS) combination of either a) Reference Accuracy (RA), Measurement and Test Equipment (M&TE) error, M&TE readability (M&TEr) and projected drift, or b) as-left tolerance and the projected drift (assuming that as-left tolerance is ≤ SRSS combination of RA, M&TE error, M&TEr). Different methods of calculating the as-found tolerance (including the inclusion of additional uncertainties (e.g., normal radiation effect, temperature effect between calibrations, capillary tubing error) may be acceptable. Alternate methods must result in an as-found tolerance that is small enough to detect abnormal channel performance. Any additional uncertainties included in the as-found tolerance calculation must be justified."
>
> and
>
> "Implementation of Note 2 may require some licensees to recalculate the as-left tolerance for some channels to ensure that realistic values are used that do not mask instrument performance."

Based on the implementation guidance for Notes 1 and 2 in TSTF-493, an as-left tolerance of ≤ SRSS combination of RA, M&TE error, and M&TEr is acceptable. Also, based on Notes 1 and 2, an as-found tolerance of ≤ SRSS combination of RA, M&TE error, M&TEr and drift is acceptable. Use of a more conservative methodology is also considered acceptable.

3.0 GEH TSTF-493 Methodology

This section provides the specific GEH TSTF-493 Methodology that is to be used in the determination of the As-Found Tolerance (AFT) and As-Left Tolerance (ALT) for setpoint calculations performed by GEH. To implement the GEH TSTF-493 Methodology for new setpoint calculations, the approved GEH Instrument Setpoint Methodology is used to calculate the instrument setpoints for the instrument loop. These setpoints include:

1. Allowable Value (AV)
2. First Nominal Trip Setpoint ($NTSP_1$), which is equivalent to the Limiting Trip Setpoint (LTSP) described in TSTF-493
3. Final Nominal Trip Setpoint ($NTSP_F$)

The GEH TSTF-493 Methodology is then used to determine the AFT and ALT based on TSTF-493 guidance for instrument performance monitoring and instrument resetting, or to confirm that similar margins in the GEH Instrument Setpoint Methodology meet the TSTF-493 guidance. The GEH TSTF-493 Methodology is dependent on the instrument loop (channel) configuration [[ ]], and the specific plant procedures used to demonstrate compliance with the Technical Specification Surveillance Requirements for loop and trip unit (if applicable) calibration. The GEH TSTF-493 Methodology only applies to the calculation of AFT and ALT values for the specific instrument functions identified in TSTF-493, and does not affect the setpoints calculated by GEH Instrument Setpoint Methodology.

Figure 3-1 provides an overview of the GEH Instrument Setpoint Methodology as it relates to the development of the GEH TSTF-493 Methodology. The GEH Instrument Setpoint Methodology is based on the methodology used in GEH safety analysis process that demonstrates all applicable safety analysis limits are satisfied. The Analytical Limits (ALs) used in the safety analysis for instrument trips provide the starting point for the determination of the instrument setpoints that are included in the plant Technical Specifications and surveillance procedures for instrument calibration.

As shown in Figure 3-1, there are two required margins that are considered in the determination of the instrument setpoints:

1. Required AV Margin – The Required AV Margin is the margin between the AL and AV that includes all instrument uncertainties under trip conditions except instrument drift. The Required AV Margin establishes the AV specified in the Technical Specifications and is calculated with sufficient margin to ensure that there is a high probability that the AL would not be exceeded if the as-found value of the instrument setting (hereafter referred to as the "as-found instrument setting") during calibration is at the AV. Thus, the AV in the GEH Instrument Setpoint Methodology is considered an important parameter in protecting the AL and assuring the validity of the safety analysis.
2. Required NTSP Margin – The Required NTSP Margin is the margin between the AL and the nominal trip setpoint that includes all instrument uncertainties under trip conditions.

The Required NTSP Margin establishes $NTSP_1$ and is calculated with sufficient margin to ensure that there is a high probability that the AL will not be exceeded for the limiting event occurring from normal operating conditions. This margin represents the minimum margin between the NTSP and the AL required by the GEH Instrument Setpoint Methodology.

In addition to these required margins, the GEH Instrument Setpoint Methodology also provides for margin between the AV and the final nominal trip setpoint ($NTSP_F$). The AV – $NTSP_F$ margin includes all instrument uncertainties under calibration conditions and is provided to reduce the probability that the AV will be exceeded during calibration conditions, and generally results in an $NTSP_F$ that is more conservative than $NTSP_1$. This margin is called the Licensee Event Report (LER) Avoidance Margin. The LER Avoidance Margin provides additional assurance that the AV will not be exceeded during the required surveillance testing and to demonstrate compliance with the Technical Specifications.

3.1 Overview of Surveillance Requirement Calibration

For each annotated setpoint, the TSTF-493 Notes are applied to two typical improved Standard Technical Specification Surveillance Requirements for BWR instrument loop calibration:

1. Trip Unit (if applicable)
2. Loop (channel)

These surveillance tests are required to first measure the as-found instrument setting before any adjustments are made. This allows an evaluation of whether or not the instrument performed within its expected tolerance. The test procedures are dependent on whether or not the instrument loop is comprised of a single device (e.g., a pressure indicating switch or bistable) or multiple devices (e.g., a transmitter and trip unit).

For a single device loop calibration, the loop is bypassed and the process input is replaced by a calibrated input source. The test input that produces the trip signal is the as-found instrument setting for the loop in terms of the process parameter units. This value is then compared to the AV to demonstrate compliance with the Technical Specification Surveillance Requirements and to the AFT to demonstrate acceptable instrument performance. Assuming the as-found instrument setting is within the predetermined loop AFT, the device is then calibrated (if necessary) and left within the predetermined ALT to meet TSTF-493 guidance.

For calibration of a multiple devices loop, the as-found instrument settings need to be determined for the trip unit when doing the trip unit test (which is typically done every 3 months), and for the entire loop when doing the full loop test (which is typically done every 18 to 24 months or each refueling outage). A typical surveillance test would proceed as follows:

1. For the trip unit calibration Surveillance Requirement, the channel is put in bypass and the trip unit input is replaced by input from a calibration source. The test input that produces the trip signal is the as-found instrument setting, which can be converted to process units as required, and compared to the AV to demonstrate compliance with the

Technical Specification Surveillance Requirements and to the AFT to demonstrate acceptable trip unit performance. Assuming the as-found instrument setting is within the predetermined trip unit AFT, the trip unit is then calibrated (if required) and left to within the predetermined ALT to meet TSTF-493 guidance.

2. For the full loop surveillance procedure for device calibration to satisfy the Surveillance Requirement, there are typically two ways the calibration may be performed to demonstrate compliance with TSTF-493, consistent with current plant surveillance procedures:

   - The first way is for the entire loop to be bypassed and tested by putting a calibration source in terms of the process parameter to the instrument input of the loop and determining the input required to initiate a trip. This becomes the as-found instrument setting for the loop and can be compared to the loop AV to demonstrate compliance with the Technical Specification Surveillance Requirements and to the AFT to demonstrate acceptable loop performance. Assuming the loop as-found instrument setting is within the predetermined loop AFT, the devices in the loop are then calibrated (if required) and left to within their predetermined loop ALT consistent with current plant surveillance procedures for device calibration to meet TSTF-493 guidance.
   - The second way is that each of the devices or device units (e.g., transmitter and square root converter for flow measurements) in the loop is tested separately, consistent with current plant surveillance procedures and the full loop is not tested as a unit. [[

]]

Based on the current plant surveillance testing, appropriate ALTs and AFTs need to be developed [[ ]] to meet TSTF-493 guidance. [[

]] A summary of the GEH TSTF-493 Methodology is provided in Section 3.4.

3.2 GEH TSTF-493 Methodology – [[ ]]

3.2.1 Objective

The objective of this section is to describe the GEH TSTF-493 Methodology used to implement the performance monitoring guidance of TSTF-493 [[ ]].

3.2.2 Terminology

The following terminology is applicable to [[ ]] that has the TSTF-493 Notes applied in the plant-specific Technical Specifications.

A_C = Instrument Accuracy under calibration conditions [[ ]]

AFT_{TSTF} = AFT consistent with the AFT allowance established in TSTF-493 [[ ]]

AFT = AFT [[ ]] determined by the GEH TSTF-493 Methodology

ALT_{TSTF} = ALT consistent with the ALT allowance established by TSTF-493 [[ ]]

ALT = ALT [[ ]] determined by the GEH TSTF-493 Methodology

AV = Allowable Value derived for the loop using the GEH Instrument Setpoint Methodology

C = Calibration Error for the loop used as the calibration error input to the GEH setpoint calculation using the GEH Instrument Setpoint Methodology

C_{TSTF} = Calibration Error (determined using TSTF-493 definition) [[ ]], defined by TSTF-493 to be equal to $[(M\&TE)^2+(M\&TEr)^2]^{1/2}$

where:

M&TE = Measurement and Test Equipment Accuracy, and

M&TEr = Measurement and Test Equipment Readability Error

D = Instrument Drift [[ ]] in the time period between calibrations

$NTSP_F$ = Final Nominal Trip Setpoint, which is the final NTSP for the instrument loop derived using the GEH Instrument Setpoint Methodology or an NTSP that is more conservative

All instrument errors used [[
]] ± 2σ (i.e., 2 standard deviations errors). This means that approximately 95% of the error data will be contained within the calculated tolerance intervals. The errors assumed in the determination of the AV, $NTSP_1$ and $NTSP_F$ are consistent with the GEH Instrument Setpoint Methodology.

3.2.3 GEH Methodology for Determining AFT and ALT

The following methodology is used to calculate the AFT and ALT [[
]], and to ensure that they are conservatively consistent with the guidance of TSTF-493.

1. TSTF-493 AFT and ALT Guidance

   $AFT_{TSTF} = (A_C^2 + C_{TSTF}^2 + D^2)^{1/2}$

   $ALT_{TSTF} = (A_C^2 + C_{TSTF}^2)^{1/2}$

2. GEH TSTF-493 Methodology AFT and ALT

   [[

   ]]

This formulation ensures that the AFT and ALT for the loop are conservatively less than (or equal to) the allowances in TSTF-493.

The result of applying the GEH TSTF-493 Methodology [[ ]] for the AFT and ALT is shown in Figures 3-2 and 3-3, respectively. The determination of the limiting or controlling values for the AFT and ALT are dependent on the results of the application of the GEH TSTF-493 Methodology and the magnitude of the instrument uncertainties used.

As shown in Figure 3-2, there are two possible controlling values for the AFT:

1. AV / $NTSP_F$ Margin Controlling – For GEH Instrument Setpoint Methodology, $|AV - NTSP_F|$ is the LER Avoidance Margin. Because of the statistics used in the determination of the LER Avoidance Margin, it is expected that this will generally be the controlling case.
2. TSTF-493 Controlling – The AFT calculated using the TSTF-493 guidance may be limiting in certain cases. The most likely example is for a setpoint calculation in which the Licensee has included extra margin (greater than the LER Avoidance Margin) between the AV and $NTSP_F$.

As shown in Figure 3-3, there are two possible controlling values for the ALT:

1. GEH ALT Controlling – The GEH ALT is an input to the setpoint calculation. It is based on Licensee input and is [[ ]]. As a result, it is expected that this will generally be the controlling case.

2. TSTF-493 Controlling – The ALT calculated using the TSTF-493 guidance may be limiting in certain cases. The most likely case is for a setpoint calculation in which the Licensee has included extra margin in the ALT, and that is used as input to the setpoint calculation.

3.3 GEH TSTF-493 Methodology – [[ ]]

3.3.1 Objective

The objective of this section is to describe the GEH TSTF-493 Methodology used to implement the performance monitoring guidance of TSTF-493 [[

]]

The GEH TSTF-493 Methodology [[

]]

To implement the TSTF-493 Methodology [[

]] $NTSP_F$ is the setpoint used in the trip unit calibration process and also corresponds to the nominal value for the output of the devices in the loop that provide input to the trip unit but do not themselves initiate a trip. [[

]]

3.3.2 Terminology

[[ ]], some plant surveillance procedures allow calibration of a group of devices in the loop as a unit (e.g., calibration of a transmitter and square root converter as a flow unit). In the GEH TSTF-493 Methodology, [[

]]

The following terminology is applicable to any [[ ]] that has the TSTF-493 Notes applied in the plant Technical Specifications.

[[

]]

AV = Allowable Value for the entire loop (channel) derived using the GEH Instrument Setpoint Methodology

[[

]]

$NTSP_F$ = Final Nominal Trip Setpoint, which is the final NTSP [[
]] using the GEH Instrument Setpoint Methodology

All instrument errors used [[
]] ± 2σ errors. This means that approximately 95% of the error data will be contained within the calculated tolerance intervals. The errors assumed in the determination of the AV and $NTSP_F$ are consistent with the GEH Instrument Setpoint Methodology.

3.3.3 GEH Methodology for Determining AFT and ALT

The following methodology is used to calculate the AFT and ALT [[
]] consistent with the guidance of TSTF-493 for the loop [[
]].

1. TSTF-493 As-Found and As-Left Tolerance Guidance

   [[

]]

The result of applying the GEH TSTF-493 methodology [[ ]] for the AFT and ALT is shown in Figures 3-4 and 3-5, respectively. The determination of the limiting or controlling values for the AFT and ALT are dependent on the results of the application of the GEH TSTF-493 Methodology and the magnitude of the instrument uncertainties used.

As shown in Figure 3-4, there are two possible controlling values for the AFT:

1. AV / $NTSP_F$ Margin Controlling – For GEH Instrument Setpoint Methodology, $| AV - NTSP_F |$ is the LER Avoidance Margin. Because of the statistics used in the determination of the LER Avoidance Margin, it is expected that this will generally be the controlling case. For this case, [[

   ]]

2. TSTF-493 Controlling – [[

   ]], the most likely case is for a setpoint calculation in which the Licensee has included extra margin between the AV and $NTSP_F$ than that required by GEH Instrument Setpoint Methodology for LER avoidance. For this case, [[

   ]]

As shown in Figure 3-5, there are two possible controlling values for the ALT:

1. GEH ALT Controlling – The GEH ALTs [[ ]] are based on utility input and are [[ ]]. As a result, it is expected that this will generally be the controlling case. For this case, [[ ]] According to GEH Instrument Setpoint Methodology, the GEH ALT is an input to the setpoint calculation and provides additional conservatism in the setpoint margins.
2. TSTF-493 Controlling – The ALT calculated using [[ ]] TSTF-493 guidance may be limiting in certain cases. The most likely case for this to occur is for a setpoint

calculation in which the Licensee has included extra margin in the ALTs provided as input to the setpoint calculation. For this case, [[

]]

3.4 Summary Application of GEH TSTF-493 Methodology

The TSTF-493 Notes for BWRs are applied to Surveillance Requirements for calibration of the entire instrument loop and for the loop trip units (if applicable). As shown in Sections 3.2 and 3.3, the applicable tolerances depend on whether [[

]]

3.4.1 [[ ]]

[[

]]

3.4.2 [[ ]]

[[

]]

3.4.3 Sample Calculations

Sample calculations for [[ ]] are provided in Appendix A. These calculations are provided to illustrate the application of the combined approved GEH Instrument Setpoint Methodology with the GEH TSTF-493 Methodology contained in this document. The calculations are not applicable to any specific plant.

The sample calculations [[ ]] are for a high dome pressure scram. [[ ]], the loop consists of a pressure indicating switch (bistable), and [[ ]] the loop consists of a transmitter and trip unit.

[[ ]] uses typical uncertainties for a high pressure scram initiated by a transmitter and trip unit. The AV and $NTSP_F$ are calculated using the GEH Instrument Setpoint Methodology. The ALTs and AFTs [[ ]] are calculated using the GEH TSTF-493 methodology.

For comparison purposes, the loop uncertainties [[ ]] The same methodologies are used to calculate the AV, $NTSP_F$, and [[ ]]

3.4.4 Compatibility with Site Calibration Procedures

The GEH TSTF-493 methodology for calculating the AFT and ALT [[ ]] does not require any change to the way the devices are currently calibrated. The GEH TSTF-493 Methodology is compatible with existing plant surveillance procedures for calibration of [[ ]], and is consistent with the guidance in TSTF-493. Licensees implementing the GEH TSTF-493 Methodology only need to ensure that the AFT and ALT in the plant surveillance procedures are consistent with the values calculated using this methodology and that the Technical Specification Notes are implemented. No other changes to the existing calibration procedures are required.

3.4.5 Application to Other Setpoint Methodologies

The methodology for calculating the AFT and ALT [[ ]] described in this LTR is based on setpoints that are initially calculated by the GEH Instrument Setpoint Methodology. However, the methodology can be applied to AV and $NTSP_F$ setpoints determined by another NRC-approved setpoint methodology because the formulation for determining the AFTs and ALTs [[ ]] consists of the statistical combination of the uncertainties consistent with the guidance in TSTF-493, and is not dependent on the methodology used to determine the AV and $NTSP_F$ values. Therefore, the setpoint tolerances for [[ ]] determined by the GEH TSTF-493

Methodology can be applied to AV and $NTSP_F$ values calculated by another NRC-approved setpoint methodology.

Figure 3-1 GEH Instrument Setpoint Methodology Overview

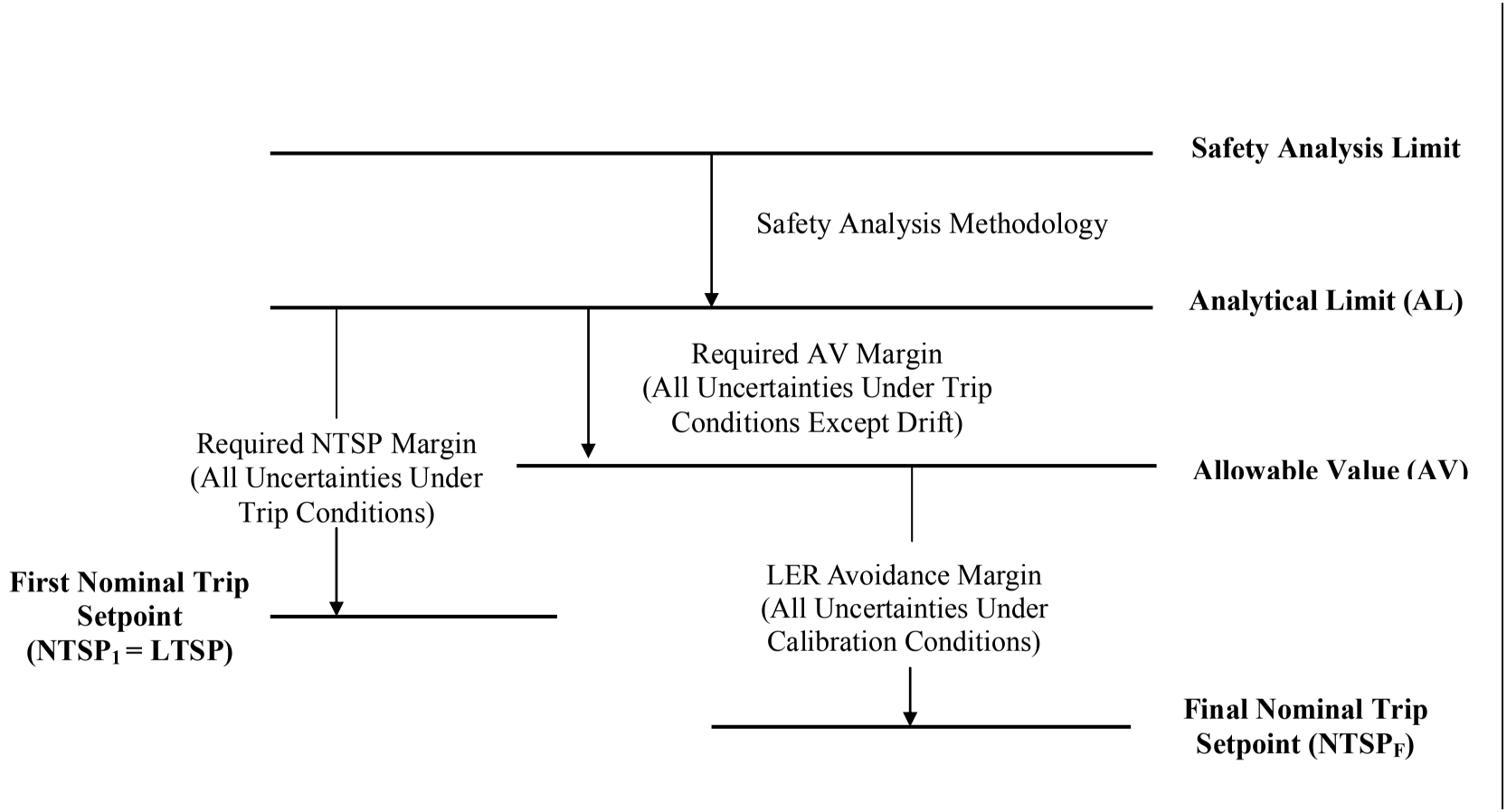


Figure 3-2 GEH AFT Implementation [[ ]]

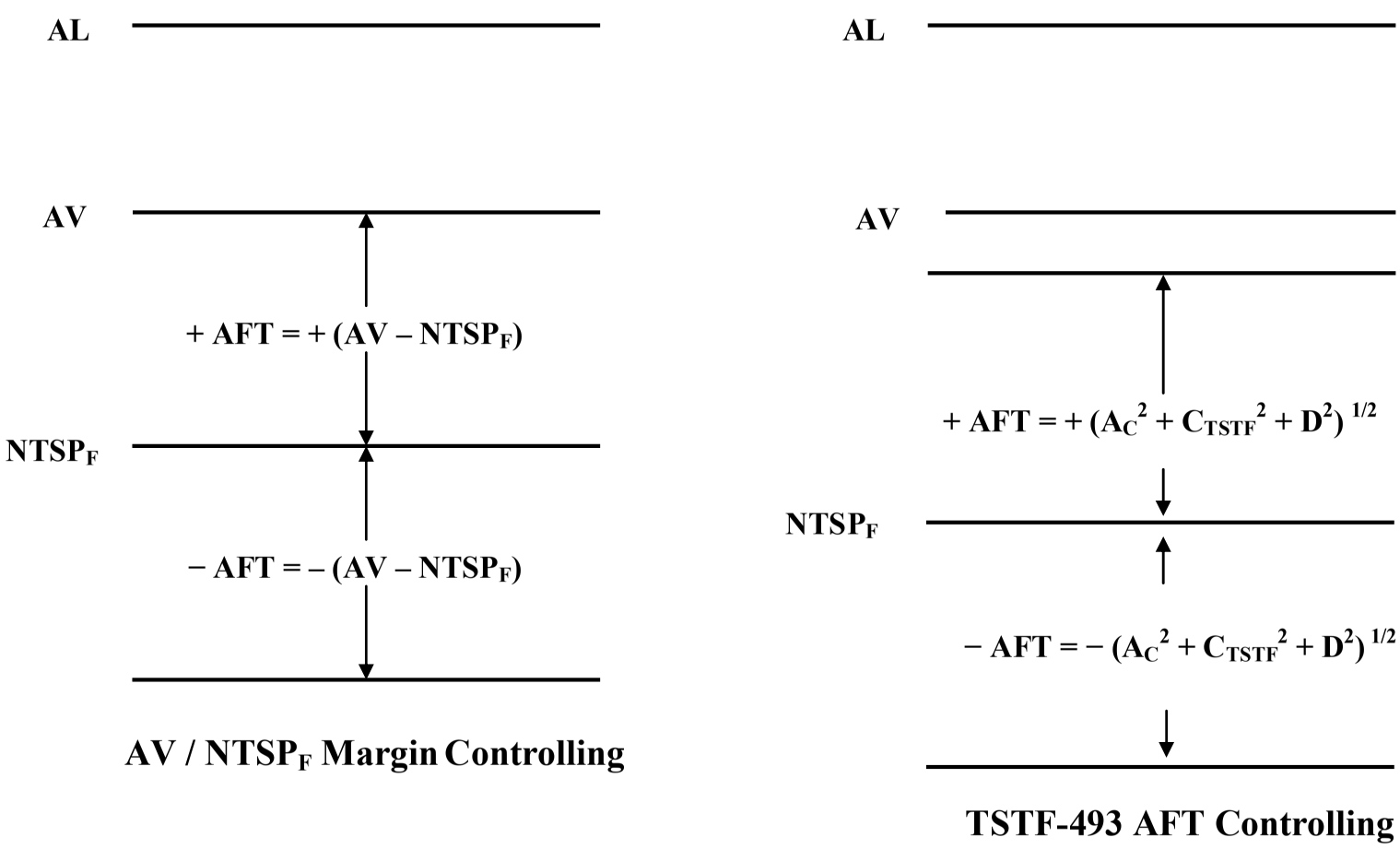


Figure 3-3 GEH ALT Implementation [[ ]]

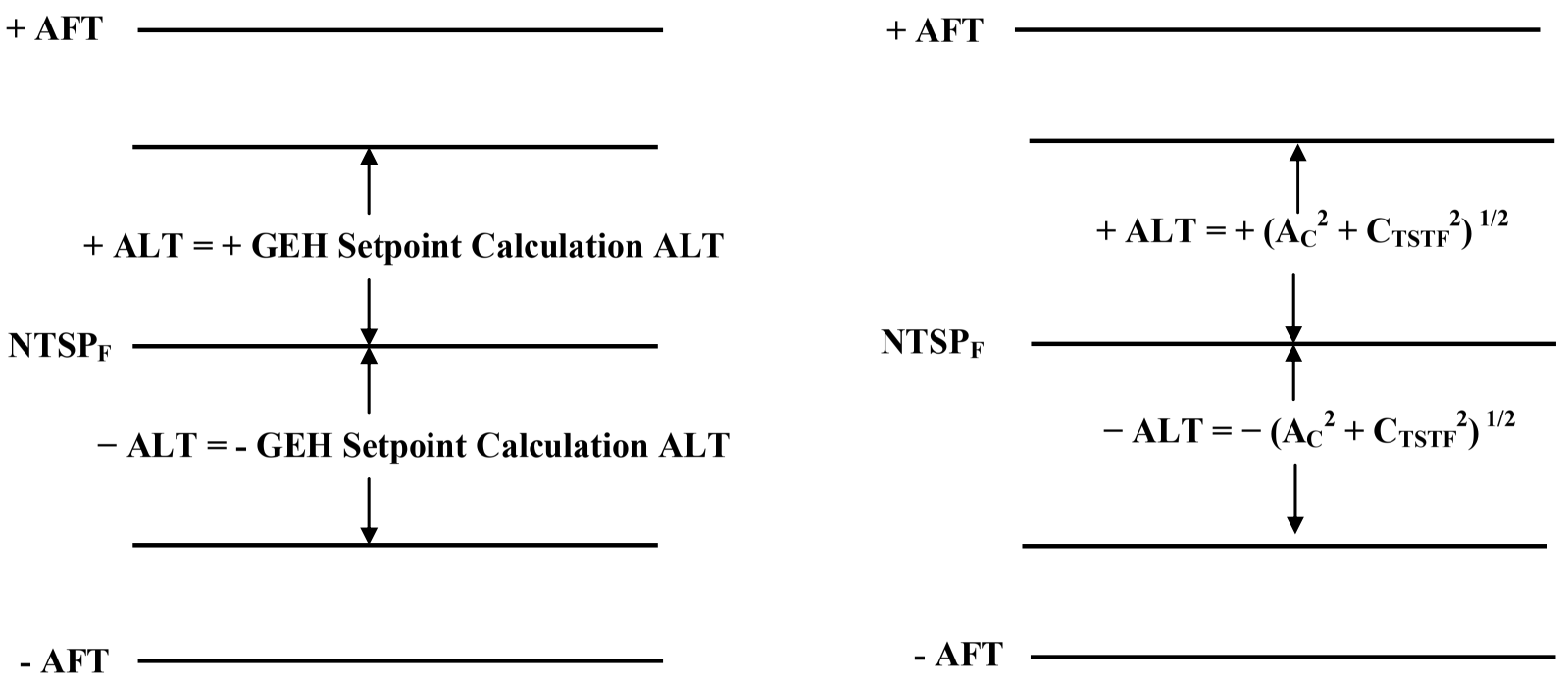


Figure 3-4 [[ ]]

[[

]]

Figure 3-5 [[ ]]

[[

]]

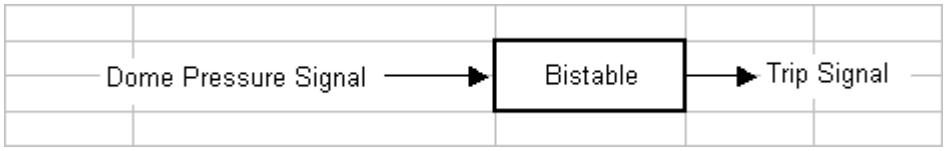
4.0 References

1. Letter, Technical Specifications Task Force (TSTF) to U.S. Nuclear Regulatory Commission (NRC), "Transmittal of Revised TSTF-493 Revision 4," TSTF-09-29, dated January 5, 2010 [ML100060064]; and Letter, TSTF to NRC, "Transmittal of TSTF-493 Revision 4, Errata," TSTF-10-07, dated April 23, 2010 [ML101160026].
2. NEDC-31336P-A, "General Electric Instrument Setpoint Methodology," September 1996.
3. NUREG 1433, Revision 3.1, Volume 1, "Standard Technical Specifications General Electric Plants, BWR/4;" and NUREG 1433, Revision 3.1, Volume 2, "Standard Technical Specifications General Electric Plants, BWR/4, Bases."
4. NUREG 1434, Revision 3.1, Volume 1, "Standard Technical Specifications General Electric Plants, BWR/6;" and NUREG 1434, Revision 3.1, Volume 2, "Standard Technical Specifications General Electric Plants, BWR/6, Bases."
5. NRC Regulatory Issue Summary 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," August 24, 2006.

Appendix A Sample Calculations

This appendix contains sample calculations for High Dome Pressure Scram implemented by both a loop containing a [[ ]] (bistable), and a [[ ]] (transmitter and trip unit), as described in Section 3.4.3. The setpoint calculation is based on GEH Instrument Setpoint Methodology and instrument accuracy and drift errors for a Rosemount Transmitter and Rosemount Trip Unit provided in Reference 2, and calibration equipment errors from typical site calibration procedures. [[ ]] (Example 1 of this Appendix) it was assumed that the errors [[ ]] shown in Example 2 of this Appendix.

Example 1: [[ ]]



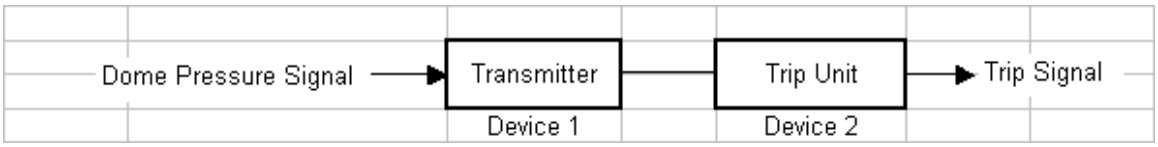
a) Input Parameters

b) Calculation Results

[[

]]

Example 2: [[ ]]



a) Input Parameters b) Calculation Results

[[

]]