ENCLOSURE 4

MFN 13-043

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Non-Proprietary Information – Class I (Public)

IMPORTANT NOTICE

This is a non-proprietary version of Enclosure 3, which has the proprietary information removed. Portions of the document that have been removed are indicated by white space with an open and closed bracket as shown here [[ ]].

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 ~~(hereafter referred to as the LER 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

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]] 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

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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.

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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, [[

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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, [[

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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

Figure 3-1 GEH Instrument Setpoint Methodology Overview