February 2, 2017

TSTF-16-11
PROJ0753

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

SUBJECT: Response to NRC Request for Additional Information Regarding TSTF-546, Revision 0, "Revise APRM Channel Adjustment Surveillance Requirement"

REFERENCE: Letter from Michelle Honcharik (NRC) to the TSTF, "Request For Additional Information Re: Traveler TSTF-546, Revision 0, 'Revise APRM Channel Adjustment Surveillance Requirement'," dated October 3, 2016 (ADAMS Accession No. ML16271A218).

On April 21, 2016, the TSTF submitted traveler TSTF-546, Revision 0, "Revise APRM Channel Adjustment Surveillance Requirement," to the Nuclear Regulatory Commission (NRC) for review (ADAMS Accession No. ML16112A208).

In the referenced letter, the NRC provided a Request for Additional Information (RAI) on the traveler. On November 14, 2016, the TSTF and the NRC held a teleconference to discuss the RAI. The attachment to this letter provides the response to the NRC questions.

The RAI responses did not result in any changes to TSTF-546, Revision 0.

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Should you have any questions, please do not hesitate to contact us.

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Attachment

cc: Alex Klein, Technical Specifications Branch, NRC
Michelle Honcharik, Technical Specifications Branch, NRC

Attachment

Response to NRC Request for Additional Information Regarding TSTF-546, Revision 0, "Revise APRM Channel Adjustment Surveillance Requirement"

The NRC comments are repeated below in italics, followed by the TSTF response.

By letter dated April 21, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16112A208), the Technical Specifications (TS) Task Force (TSTF) submitted to the U.S. Nuclear Regulatory Commission (NRC) for review Traveler TSTF-546, Revision 0, "Revise APRM [average power range monitor] Channel Adjustment Surveillance Requirement [(SR)]."

TSTF-546 relies on the premise that a high APRM setting is conservative, requests applicability for all boiling water reactors (BWRs), and uses an approach similar to that taken in the Westinghouse Electric Company (Westinghouse) Standard Technical Specifications (STS). However, for BWRs with detect and suppress reactor protection system (RPS) trip (e.g., oscillation power range monitor (OPRM) trip), a high APRM reading (for which the detect and suppress trip relies on the same instrumentation) has the potential to be non-conservative, unlike Westinghouse plants which do not have such a system. Specifically, some BWRs have the following notes in SR 3.3.1.1.9 and SR 3.3.1.1.11.

Note 1 states that neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day calorimetric calibration (SR 3.3.1.1.2) and the [1000] MWD/T LPRM calibration against the transverse in-core probes (SR 3.3.1.1.6).

A second Note is provided that requires the APRM and intermediate range monitor (IRM) SRs to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

A signal that is biased high has the potential to reduce sensitivity in the OPRM trip. Further, a noisier signal, at certain frequencies, has the potential to either delay required reactor scrams or lead to an increase in spurious reactor scrams.

a. Considering that for some stability solutions a high local power range monitor signal is potentially non conservative and stability solutions are not part of the STS, describe how the Model Application will address the different plant-specific stability solutions.

b. Demonstrate that not meeting SR 3.3.1.1.2 due to a high APRM signal is always conservative for RPS trips that rely on SR 3.3.1.1.2, directly or indirectly, specifically address each stability solution.

c. If it cannot be demonstrated that not meeting SR 3.3.1.1.2 due to a high APRM signal is always conservative for RPS trips that rely on SR 3.3.1.1.2, directly or indirectly, for every BWR then provide a justification for TSTF-546 to be applicable to all BWRs.

Attachment

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TSTF Response

TSTF-546 revises Surveillance Requirement (SR) 3.3.1.1.2 to compare the calculated (i.e.; calorimetric heat balance) power to the Average Power Range Monitor (APRM) indications, and to adjust the APRM consistent with the heat balance power if the calculated power is more than 2% greater than the APRM channel output when operating at ≥ 25% of Rated Thermal Power. This change revises the SR to require adjustment only if the APRM indication deviates from the calculated power by more than 2% in the non-conservative direction.

Response to item (a):

The local power range monitors (LPRMs) are not affected by the proposed change. Although the LPRM signals are averaged by the APRM circuitry, the gain adjustment affected by SR 3.3.1.1.2 only affects the APRM channel output, and not the LPRM output. Hence all stability solutions that rely on LPRMs as the main licensing basis protection are not affected. These include Option III (both GEH hardware and ABB hardware) and Detect and Suppress Solution – Confirmation Density (DSS-CD) stability solutions.

Response to items (b) & (c):

Stability solutions that rely on LPRMs are not affected by the proposed change. For all stability solutions that rely on the APRMs as the main licensing basis protection, this licensing change request could only result in an earlier (and hence a more conservative) APRM scram. These stability solutions include Option I-D, Option II, Enhanced Option I-A (E1A), and the automatic backup stability solution for DSS-CD.

In the November 16, 2016 teleconference on the RAI, the NRC stated that some plants contain TS Notes that imply that both the LPRMs and APRMs are required for stability system operability. We believe the Notes in question may be similar to the following in a plant's TS 3.3.1.1, "RPS Instrumentation," Table 3.3.1.1-1, Function 2.f, "Average Power Range Monitors, OPRM [Oscillation Power Range Monitor] Upscale," which states "Each APRM/OPRM channel provides inputs to both trip systems." The TS Bases of the function clarify the design of the OPRM system. The Bases state, "The OPRM Upscale Function provides compliance with GDC 10 and GDC 12, thereby providing protection from exceeding the fuel MCPR safety limit (SL) due to anticipated thermal-hydraulic power oscillations," and "The OPRM Upscale Function receives input signals from the local power range monitors (LPRMs) within the reactor core, which are combined into 'cells' for evaluation by the OPRM algorithms."

In summary, the proposed change to the APRM SR will not affect the effectiveness of any stability solution.