June 6, 2012

Technical Specifications Task Force (TSTF)
11921 Rockville Pike, Suite 100
Rockville, MD 20852

SUBJECT: SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF TRAVELER TSTF-534, REVISION 0, "CLARIFY APPLICATION OF PRESSURE BOUNDARY LEAKAGE DEFINITION" (TAC NOS. ME7144 AND ME7145)

Dear Members of the TSTF:

By letter dated September 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112620441), you submitted Traveler TSTF-534, Revision 0, "Clarify Application of Pressure Boundary Leakage Definition," to the U.S. Nuclear Regulatory Commission (NRC) staff for review and approval. The purpose of this letter is to provide the results of the NRC staff's acceptance review of this TSTF Traveler. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies.

The NRC staff has reviewed your submittal and concluded that the information delineated in the enclosure to this letter is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the proposed TSTF Traveler. In order to make the submittal complete, the NRC staff requests that the TSTF supplement or revise the Traveler to address the information requested in the enclosure within 90 days of the date of this letter. This will enable the NRC staff to complete its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review, and the NRC staff will cease its review activities. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

Section 170.21 of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that Travelers are subject to fees based on the full cost of the review. You did not request a fee waiver; therefore, NRC staff hours will be billed accordingly.

The information requested and associated time frame in this letter were discussed with Brian Mann, Excel Services.

If you have any questions, please contact me at (301) 415-1774 or michelle.honcharik@nrc.gov.

Sincerely,

/RA/

Michelle C. Honcharik, Senior Project Manager
Licensing Processes Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 753

Enclosure:
As stated

cc w/enclosure: See next page

The information requested and associated time frame in this letter were discussed with Brian Mann, Excel Services, on [DATE].

If you have any questions, please contact me at (301) 415-1774 or michelle.honcharik@nrc.gov.

Sincerely,

/RA/

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Enclosure:
As stated

cc w/enclosure: See next page

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Grover, Ravinder
Jennifer Gall
Steve Jones
Ken Karwoski
Keith Hoffman

ADAMS Accession No: ML113460091 **NRR-106**

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DATE	12/16/11	12/21/11	6/1/12	1/13/12
OFFICE	SBPB/BC	SRXB/BC	PLPB/BC	PLPB/PM
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DATE	5/31/12	1/11/12	6/4/12	6/6/12

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NRC Staff Comments Regarding TSTF 534

Regulatory Background

The regulation at Section 50.2 of the Title 10 of the *Code of Federal Regulations* (10 CFR), "Definitions," defines Reactor Coolant Pressure Boundary (RCPB) as follows:

> Reactor coolant pressure boundary means all those pressure-containing components of boiling and pressurized water-cooled nuclear power reactors, such as pressure vessels, piping, pumps, and valves, which are:
>
> (1) Part of the reactor coolant system, or
>
> (2) Connected to the reactor coolant system, up to and including any and all of the following:
>
> (i) The outermost containment isolation valve in system piping which penetrates primary reactor containment,
>
> (ii) The second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary reactor containment,
>
> (iii) The reactor coolant system safety and relief valves.
>
> For nuclear power reactors of the direct cycle boiling water type, the reactor coolant system extends to and includes the outermost containment isolation valve in the main steam and feedwater piping.

Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," *Criterion 14—Reactor coolant pressure boundary*, states:

> The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

Regulatory Guide (RG) 1.45, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage," Revision 1, states:

> RCPB leakage is leakage from a nonisolable fault in the material of an RCS [reactor coolant system] component, pipe wall (including welds), or vessel wall. Leakage from seals, gaskets, and mechanical connections (e.g., bolts, valve seals) is not considered RCPB leakage although these components are part of the RCPB, as defined in 10 CFR 50.2, "Definitions" (Ref. 2). Thus, RCPB leakage is indicative of degradation of pressure retaining components that could ultimately result in a loss of component structural integrity.

Proposed Change

The change proposed by TSTF-534 modifies the technical specification definition of pressure boundary leakage by the following addition indicated in italics:

> LEAKAGE (except primary to secondary LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall. *A fault in an RCS component body, pipe wall, or vessel wall is isolated if LEAKAGE through the isolation device is ≤ 0.5 gpm per nominal inch of valve size up to a maximum limit of 5 gpm.*

A limiting condition for operation (LCO) applicable to all operating reactors specifies <u>no</u> pressure boundary leakage. Therefore, a change to the definition of pressure boundary leakage redefines the LCO.

NRC Staff Comments

As indicated by the discussion in RG 1.45, RCPB leakage indicates an abnormal and unexpected condition that could ultimately result in a loss of component structural integrity. Leakage itself is indicative of a state that the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requires the operator to repair. Isolation of the leaking component does not resolve the condition involving unexpected material degradation of an ASME Class I component. Therefore, this modification of the LCO effectively allows operation for an unlimited time with unacceptable degradation affecting a Class I component. The change should be modified to lead to the timely repair of the component and to preclude unjustified mode changes prior to completion of the repair.

The proposed change requires no assessment of the safety-significance of the degradation. The proposed change should include a means of assessing the extent of the degraded condition and the operability of the RCPB before permitting further unrestricted operation. For example, a degraded in-core instrument tube may be indicative of a common condition affecting multiple tubes, and isolation of a single degraded tube would not prevent further degradation of the remaining tubes. The change should be modified to provide a limited action time to assess the safety significance and to establish criteria for continued operation related to the extent of the degradation.

The proposed change should also address future degradation of the RCPB as a result of the leakage. The change should provide a means for evaluating future degradation of the RCPB resulting from the leakage. Operating experience has shown that leakage rates much smaller than the proposed 5 GPM limit have caused significant RCPB degradation.

The proposed change should also assess the reliability of the isolation device relative to the size of the degradation. Operation with single device isolation may not be appropriate when the degraded area affects a large diameter pipe. For example, development of a circumferential crack in an excess letdown line weld may pose excessive risk if only isolated from the RCS by a single valve, and continued operation would then be inappropriate.

In addition, the proposed change only marginally addresses the qualification of any isolation device employed in the isolation of leakage. The change should be modified to specify the precise qualification requirements of any isolation device, limit the size of the isolation device relative to the safety-significance of the degradation, and provide administrative controls related to the testing and the positioning of the isolation device.

cc:

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