



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

May 11, 2020

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RE: TRAVELER TSTF-576,  
REVISION 0, "REVISE SAFETY/RELIEF VALVE REQUIREMENTS"  
(EPID L-2019-PMP-0207)

Dear Members of the Technical Specifications Task Force:

By letter dated December 13, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19347A726), you submitted to the U.S. Nuclear Regulatory Commission (NRC) for review Traveler TSTF-576, Revision 0, "Revised Safety/Relief Valve Requirements."

Upon review of the information provided, the NRC staff has determined that additional information is needed to complete the review. On May 7, 2020, Mr. Brian Mann, Vice President of Industry Programs, EXCEL Services Corporation, agreed that the NRC staff will receive your response to the enclosed request for additional information questions within 90 calendar days of the date of this letter.

The review schedule that was provided in the acceptance letter dated February 13, 2020 (ADAMS Accession No. ML20037A129), has not changed.

MILESTONE	SCHEDULE DATE
Issue Draft Safety Evaluation	February 18, 2021
Issue Final Safety Evaluation	June 5, 2021

If you have any questions, please contact me at (301) 415-1774 or via e-mail to [Michelle.Honcharik@nrc.gov](mailto:Michelle.Honcharik@nrc.gov).

Sincerely,

Michelle C. Honcharik, Senior Project Manager  
Technical Specifications Branch  
Division of Safety Systems  
Office of Nuclear Reactor Regulation

Project No. 753

Enclosure:  
Request for Additional Information

cc: See next page

cc:

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<b>DATE</b>	5/11/2019	5/11/2020	5/11/2020

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## **REQUEST FOR ADDITIONAL INFORMATION**

### **TECHNICAL SPECIFICATIONS TASK FORCE**

#### **TRAVELER TSTF-576, REVISION 0, "REVISE SAFETY/RELIEF VALVE REQUIREMENTS"**

**(EPID L 2019-PMP-0207)**

By letter dated December 13, 2019, the Technical Specifications Task Force (TSTF) submitted Revision 0 of Traveler TSTF-576, Revision 0, "Revise Safety/Relief Valve Requirements," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19347A726). TSTF-576, Revision 0, proposes to remove the safety relief valve (SRV) settings from the Standard Technical Specifications (STS) for boiling water reactor (BWR) plants. The setpoints are proposed to be moved to a licensee controlled in-service testing (IST) program and the limiting conditions for operation (LCOs) and surveillance requirements (SRs) for the related technical specification (TS) are proposed to be changed. The NRC staff has reviewed the submittal and determined that it does not contain adequate information to assure that regulations will be met if the submittal is adopted as written.

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36 requires that TS be derived from the evaluations in the final safety analysis report (FSAR). It also requires that the TS include safety limits. The safety limit on reactor coolant system (RCS) pressure is a subject of the submittal. Section 50.36 of 10 CFR discusses limiting safety system settings for devices that have significant safety function and requires the limiting safety system settings are chosen such that automatic action will correct an abnormal condition prior to a safety limit being exceeded. The regulation also requires that LCOs be established to define the lowest functional capability of equipment required for safe operation of the plant. With respect to the establishment of LCOs, the NRC staff cannot be assured that 10 CFR 50.36(b) will be met if the submittal is approved as written. These regulatory requirements must be considered individually and as whole to ensure that safe plant operation is assured. Additionally, the NRC staff concluded that the submittal does not provide adequate technical information to assure that Safety Limit 2.1.2 on RCS pressure will not be exceeded. Based on the submittal, the NRC staff could not conclude that the intent of 10 CFR 50.36 will be met if the change is approved as proposed. See the requests for additional information (RAIs) below for additional details. As discussed in the items below, the submittal does not provide adequate information to assure the staff that system testing, test frequencies, operability evaluations methods, and valve lift setpoints will be controlled adequately. The submittal also lacks technical bases for several statements included therein.

1. TSTF-576 states that future operability determinations will use assumptions similar to the overpressure analysis of record (AOR). The NRC staff understands that licensees will use licensing basis assumptions in their method for performing operability determinations. Provide any differences from the design basis calculations that will be utilized in the operability evaluations. An obvious example of a change is the use of test results as inputs for SRV lift pressures instead of using the upper allowable existing TS setpoints. The NRC staff notes that the intent of FSAR Chapter 15 analyses is to use conservative assumptions

Enclosure

to bound the results. Section 15.0 of the Standard Review Plan (NUREG-0800)<sup>1</sup>, directs the reviewer to verify that the applicant used parameters and initial conditions in the analyses that are suitably conservative, however, staff notes that as-found lift pressures for any given cycle are not conservative values.

- a. Discuss how the operability determination method will remain conservative and assure sufficient margin to the RCS pressure Safety Limit is maintained as required by Criterion 15, "Reactor Coolant System Design," of Appendix A "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50. Consider including a minimum margin between a licensee's operability determination value and the Safety Limit in the revised TS Bases.
- b. Discuss whether the methodology will use the AOR assumptions (other than the use of tested lift pressures in place of assumed lift pressures).
  - i. Discuss whether as-tested lift pressures that are lower than the assumptions in the AOR will be used. For example, if a valve lifts below the setpoint, or below the assumed lift point used in the AOR, what value is used in the operability evaluation?
  - ii. Describe whether the methodology assumes any valves out of service (unable to lift). Compare this to existing AOR assumptions.
  - iii. Provide a description of what will be done in the analyses for any valve that is not tested.
  - iv. Provide similar information for valves that are tested, but the lift setpoint cannot be determined.
  - v. Discuss the ability of the methods used to model valve flow characteristics and line losses for the use of multiple SRVs, specifically any changes that might be needed in order to account for each individual valve's opening setpoint.
- c. Discuss whether single failure assumptions other than those used in the AOR should be evaluated. For example, is the failure of an SRV to open more or less conservative than a delayed scram due to failure of an anticipatory trip.
- d. TSTF-576 states that future operation with the reinstalled SRVs is expected to meet all design and licensing basis requirements. Provide the basis for this statement and for using a methodology that incorporates only previous cycle test data in a forward-looking evaluation. Specifically, discuss why there would be reasonable assurance that the forward-looking evaluation will meet the design and licensing basis requirements. Include consideration of the degradation mechanism affecting the valve lift setpoints.
  - i. Provide a justification for the valve lift data used in the operability determinations. How was it determined that the removed and tested valve lift pressures assure acceptable performance for the next cycle? If valves are not removed during each refueling outage how will it be determined that they will continue to operate acceptably?

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<sup>1</sup> U.S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," NUREG-0800, Chapter 15, Section 15.0, "Introduction - Transient and Accident Analysis," Revision 3, March 2007 (ADAMS Accession No. ML070710376).

- ii. Describe how uncertainties in the data due to the degradation mechanism, test methods, and other factors, are considered in the use of the test data.
    - iii. Justify the statement that "Future operation with the reinstalled S/RVs is expected to meet all design and licensing basis requirements" when it is known that they frequently drift to setpoints outside the design and setpoints assumed in the safety analysis.
    - iv. TSTF-576 states "In all cases in which the SR was not met due to setpoint drift, the Licensee Event Reports (LER) concluded that the S/RVs as a group would have retained the capability to protect Safety Limit 2.1.2." This statement appears to be the basis for the statement that all SRVs are expected to meet all design and licensing basis requirements. Staff is under the impression that the LER findings are based on best-estimate calculations. Would the same findings have been made if conservative AOR calculations were performed?
  - e. Considering the importance of previous cycle data in establishing current operability, discuss the timing associated with performing any required past operability analyses based on the removed SRV test results. Provide a recommended time for completing the past operability determination, if it is required. Provide an example of a past operability evaluation that illustrates how an evaluation would typically be performed.
2. 10 CFR 50.36 (b) states "The technical specifications will be derived from the analyses and evaluation included in the safety analysis report..." Currently, there is consistency between the TSs and analyses in the safety analysis report as the SR setpoint range is the same as that used in the AOR. However, with the new proposed TS, this will not be the case as the post-SR calculations will compare peak dome pressure with the safety limit rather than the setpoints used in the AOR. Therefore, the proposed TS changes do not appear to be consistent with the current analysis as described in licensees FSARs. Provide a discussion of how the proposed TS changes are consistent with existing plant AORs. How will plants' AORs remain consistent with the methodology used to determine operability.
- a. Describe how a licensee would proceed if the operability evaluation determines that the calculated peak RCS dome pressure does not exceed the Safety Limit, but the value in the plant's AOR is exceeded.
  - b. Does the AOR need to be revised to account for system level performance instead of component level?
  - c. Does the AOR need to be revised to reflect a reduced margin to the TS Safety Limit?
  - d. Discuss how SRVs that are found to lift outside the assumptions in the AOR and/or the established as-found tolerance will be evaluated for an unanalyzed condition that significantly degrades plant safety.
3. TSTF-576 states that the measured SRV lift pressures will be used in the analysis to determine if the SR is met. This implies that all SRVs will be tested, however, the traveler also states that periodic testing of SRVs will still be performed as required by Appendix I of the ASME OM Code. Discuss this discrepancy and describe what will be done to determine values for valve lift pressures to be used in the analysis.

4. Provide a justification that the change is adequate to assure that the SRVs open when manually actuated and that the downstream piping is unobstructed. Alternately justify that this action is not required or will be performed during post-maintenance testing.
  - a. The existing BWR/4 SR 3.4.3.2 requires that the valves open when manually actuated. The BWR/6 SR 3.4.4.3 is identical. The existing STS Bases for these SRs state that the purpose of the SR is to verify that the valve is functioning properly and that there is no blockage in the discharge line. The proposed change to BWR/4 SR 3.4.3.2 adds a note that valve actuation may be excluded, and the wording of the SR is changed to require that only the valves acting in the relief mode actuate on an initiation signal. The note in the proposed SR is contradictory to the SR requirement. The SR requires valve actuation, but the note says actuation may be excluded. This is confusing and should be changed to provide clear guidance. The proposed STS Bases state that the purpose is to verify that the mechanical portions of the auto relief valve mode operation. The SRV must open to perform these functions and opening is a mechanical action. The change to BWR/4 SR 3.4.3.2 and the deletion of BWR/6 SR 3.4.4.3 eliminate the requirements that assure that the valves will actually open and be able to pass flow. What is the basis for revising the TS to eliminate the requirement to actuate all SRVs? Provide a justification for eliminating the SRs that clearly require each valve be actuated and flow through the discharge piping be verified.
  - b. If these functions are being verified via post-maintenance testing, justify their removal as SRs and provide the actions that plants will take to verify that the valves will mechanically actuate and that the discharge lines are free of obstructions.
5. The requested change focuses solely on the overpressure protection function of the SRVs. Provide a discussion of how the change will ensure that trends in valve behavior will be evaluated to ensure that plant safety is adequately assured. For example, how will valve test results be trended and evaluated? Will that be done at an individual plant level only, or at a fleet or industry level? What, if any, visibility will the NRC have to that trending data.
  - a. Opening at a lower pressure has the potential to initiate a transient and challenge other safety systems. Provide a justification for removal of the lower setpoint from TS.
  - b. Removal of the valve tolerances from TS could ultimately result in less testing and maintenance applied to the valves which in turn might result in an increased tendency for the SRVs to drift to lower setpoints and leak. Seat leakage can contribute to damaging water hammer following a loss of offsite power during restart of the residual heat removal system as described in NRC Information Notice 87-10, Supplement 1, "Potential for Water Hammer during Restart of Residual Heat Removal," dated May 15, 1997. Describe how this issue was considered in development of the traveler and how it will be prevented in the future.
6. Current TS have LCOs for one or more SRVs out of service. The current STS Bases state that all SRVs must be operable due to the energy in the system. The STS Bases also state, with one or two SRVs inoperable the overall reliability of the SRV system is reduced. Thus, the LCO for one or two valves inoperable exists. The traveler does not address the effects of the inoperability of one or more SRVs on the overall reliability of the system. This

is similar to having one train of a safety system inoperable. Considering that the valves are less reliable than originally assumed it seems that the consideration of reliability is more relevant than when the existing TS were developed. Provide the basis for deleting these LCOs from 3.4.3 (BWR/4) and 3.4.4 (BWR/6). Discuss how allowing one or more valves to remain inoperable while the overpressure protection system is operable maintains sufficient margin as required by Criterion 15.

7. Page 4 of the model application, response to question 1, states that the ability of the SRVs to mitigate any accident previously evaluated is not significantly decreased. In addition, page 5 of the model application, response to question 3, states that the margins of safety are not significantly reduced. Considering the information provided in the traveler, the NRC staff could not verify these statements are correct. Provide justifications for these claims. If the staff gains adequate understanding of the other RAIs associated to this project, the answer to this RAI may be evident.