

February 23, 2016

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RE: TRAVELER TSTF-553,
REVISION 0, "ADD ACTION FOR TWO INOPERABLE CREATCS TRAINS"
(TAC NO. MF7061)

Dear Members of the Technical Specifications Task Force:

By letter dated October 31, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15304A002), you submitted to the U.S. Nuclear Regulatory Commission (NRC) Traveler TSTF-553, Revision 0, "Add Action for Two Inoperable CREATCS [Control Room Emergency Air Temperature Control System] Trains." Upon review of the information provided, the NRC staff has determined that additional information is needed to complete the review. On February 22, 2016, Brian Mann, Vice President of Industry Programs, EXCEL Services Corporation, and I agreed that the NRC staff will receive your response to the enclosed request for additional information (RAI) questions within 60 calendar days of the date of this letter (or the next business day if 60 days falls on a weekend).

The review schedule below that was provided in the acceptance letter, dated December 15, 2015 (ADAMS Accession No. ML15328A367), is still valid.

MILESTONE	ORIGINAL DATE
Issue Draft Safety Evaluation	August 26, 2016
Issue Final Safety Evaluation	October 31, 2016

If you have any questions regarding the enclosed RAI questions, please contact me at 301-415-1774 or via e-mail at 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: See next page

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Sincerely,

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Michelle C. Honcharik, Senior Project Manager
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ADAMS Accession No.: ML16028A453

*concurrent via e-mail

**concurrent via internal memo (ML16020A384 and ML16039A279)

NRR-106

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Letter to Technical Specifications Task Force dated February 23, 2016

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Technical Specifications Task Force

Project No. 753

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REQUEST FOR ADDITIONAL INFORMATION

TSTF-553, REVISION 0, "ADD ACTION FOR TWO INOPERABLE CREATCS TRAINS"

(TAC NO. MF7061)

By letter dated October 31, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15304A002), the Technical Specifications Task Force (TSTF) submitted to the U.S. Nuclear Regulatory Commission (NRC) for review Traveler TSTF-553, Revision 0, "Add Action for Two Inoperable CREATCS [Control Room Emergency Air Temperature Control System] Trains."

TSTF-553 proposes to revise the current Technical Specification (TS) 3.7.11, to modify the TS Actions for two inoperable CREATCS trains. The revised Action provides 24 hours to restore a CREATCS train to operable status, provided the control room area temperature is maintained below a plant-specific limit. TSTF-553 is applicable to all Babcock & Wilcox and Westinghouse plants (NUREG-1430 and NUREG-1431).

Question #1 is from the Probabilistic Risk Assessment Operations and Human Factors Branch (APHB). Questions #2 through #5 are from the Containment and Ventilation Branch (SCVB).

RAI #1:

Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," *Criterion 19 – Control room*, states, in part: "A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe shutdown condition under accident conditions, including loss-of-coolant accidents."

NUREG-0700, "Human-System Interface Design Review Guidelines," Revision 2, Section 12, "Workplace Design," Subsection 12.1.2.1, "Temperature and Humidity," Guideline 12.1.2.1-1, "Comfort Zone," states: "The climate control system should maintain temperatures of 68-75°F in winter and 73-79°F in summer and relative humidity levels between 30% and 60%." Further, the additional information accompanying this guideline, states, in part: "The temperature ranges given are based on the ASHRAE [American Society of Heating, Refrigerating and Air-Conditioning Engineers] 55-1992."

While the above guidance addresses the temperature comfort zone in the control room, it does not consider maximum allowable temperatures and associated stay times (action times), to ensure control room habitability. Related guidance for heat stress exposure is found in NUREG-0700, Revision 2, Section 12, Subsection 12.2.5.1, "Heat," Guideline 12.2.5.1-1, "Heat Stress," which states: "The level of physical activity and required protective clothing, as well as temperature and humidity, should be considered when assessing the danger of heat exposure. Further, the additional information accompanying this guideline, states: "Important considerations are the amount of metabolic heat being generated by the worker and the restriction of evaporative heat loss associated with protective clothing. Workers' abilities to withstand heat will also differ

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based on their physical conditioning and degree of acclimatization.” While this guidance is provided for Local Control Stations and not Control Rooms, it addresses the effects of heat stress for workers with low metabolism (which is characterized as light work, such as actively monitoring spatially distributed equipment, walking, retrieving procedures or manuals, etc.) and work clothes. Table 12.7, “Stay times for different WBGTs [Wet-bulb globe temperatures],” illustrates that, for example, the stay time for WBGT of 93°F for an individual in work clothes with low metabolism is limited to 3 to 8 hours, whereas the stay time for WBGT of 97°F for the same individual would be limited to 2 to 4 hours.

With both CREATCS trains being inoperable, the effects of heat stress due to the rising temperature, under some circumstances, may impede the operators’ ability to take actions required to safely operate the nuclear power unit.

TSTF-553, Revision 0, Section 2.4, “Description of the Proposed Change,” states, in part: “The proposed Required Actions require verification that control room temperature is less than a plant-specific limit every 4 hours and restoration of one CREATCS train to operable status within 24 hours.” Further, Section 3, “Technical Evaluation,” states, in part: “The four-hour monitoring frequency of control room area temperature is adequate given the indications available in the control room, the time required for a significant increase in control room air temperature, and NRC acceptance of this interval in similar Technical Specifications for other plant designs.”

Provide additional information to clarify why the proposed temperature monitoring frequency is set at 4 hours, and does not vary with the plant-specific maximum temperature limit. In the response, identify what industry standard(s) or guidance (such as, for example, EPRI TR-109445, “Heat Stress Management Program for Power Plants”), or other data were used in determining the acceptable stay times, based on varying temperature and humidity levels.

RAI #2

Page 2 of TSTF-553, Revision 0, second paragraph states:

Depending on the plant design, the CREATCS and the CREVS [Control Room Emergency Ventilation System] or CREFS [Control Room Emergency Filtration System] may share components, such as ductwork, dampers, or doors. Inoperability of the CREATCS or of the CREVS or CREFS would not affect the operability of the other system unless a shared component, such as ductwork, is affected.

The last sentence, although not incorrect, is limited to passive components only. Depending on the system configuration, many plants are designed to have flow in series through active components such as fans in CREVS and CREATCS. In such cases, there is a potential for an inoperable CREATCS fan to render the CREVS also inoperable. On the other hand, an inoperable chiller or a chilled water pump in CREATCS may not have an impact on CREVS operability. In this regard, the NRC staff requests additional discussion in the Traveler as to how these situations regarding CREVS operability would be implemented/handled in the TS, including possible entry into limiting condition for operation (LCO) 3.7.10.F.

RAI #3

Page 3 of TSTF-553, Revision 0, and first bullet under the paragraph starting “The requirements are not consistent . . .” states:

NUREG-1432, the ISTS [improved standard technical specifications] for Combustion Engineering plants, TS 3.7.11, provides 24 hours to restore one of two inoperable control room cooling trains provided mitigating actions are implemented and the Reactor Coolant System (RCS) Specific Activity TS Limiting Condition for Operation (LCO) is met. This allowance was approved by the NRC on May 30, 2013 as TSTF-426, Revision 5, “Revise or Add Actions to Preclude Entry into LCO 3.0.3 - RITSTF Initiatives 6b & 6c” [. . .]. To date, this traveler has been adopted by four of the eight Combustion Engineering plants.

The referenced TS 3.7.11 is incorrect for control room cooling trains. The information in TS 3.7.12 applies to control room cooling trains. The reference to RCS Specific Activity TS LCO is also incorrect. It applies to Control Room Emergency Air Cleanup System (TS 3.7.11), not the control room cooling trains. Revise the references and the discussion to convey its intended purpose and use in TSTF-553.

RAI #4

Section 3, Technical Evaluation, second paragraph, last sentences states:

This evaluation may credit compensatory actions, such as use of normal ventilation systems, opening of cabinet doors, use of fans or ice vests, and opening control room doors or ventilation paths. If the control room envelope boundary is breached in order to provide cooling, the Actions of TS 3.7.10 (CREVS/CREFS) would also apply. This evaluation is performed for normal operating conditions including the availability of normal electrical power based on the small likelihood of an event requiring the CREATCS during the 24 hour Completion Time.

In addition to what was stated in RAI #2, this is one area of the interdependency between CREATCS and CREVS. It brings out a conflict between the proposed compensatory actions under the TS for CREATCS and the existing mitigating actions under TS 3.7.10 for CREVS/CREFS. Opening the control room doors would compromise the control room boundary thus placing the plant in TS 3.7.10 Action Statement B.1, requiring immediate initiation of action to implement mitigating actions. Opening control room doors intentionally, in effect, could also render both trains of CREVS/CREFS to be inoperable due to inoperable control room boundary in MODE 1, 2, 3, or 4 during the 24 hours, along with both trains of CREATCS. Why is this acceptable? What would then be the immediate mitigating actions that can be initiated under TS 3.7.10 Action Statement B.1? The Traveler should address this issue in more detail, and also provide guidance to licensees to address this condition in their plant-specific submittals.

RAI #5

The last paragraph in “Attachment 2 – Justification of the Control Room Area Temperature Limit” states:

This evaluation is performed for normal operating conditions including the availability of normal electrical power based on the small likelihood of an event requiring the CREATCS during the 24 hour Completion Time.

This statement made here and other places in the Traveler, also needs to consider control room habitability, not only from temperature view point but also from other aspects applicable to the plant such as hazardous chemicals, smoke, etc. The CREFS plays a larger role in protecting the control room operators under such conditions. How does temperature mitigating actions such as opening control room doors impact the readiness of CREFS to protect control room habitability from other aspects applicable?