

April 27, 2018

TSTF-17-19
PROJ0753

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

SUBJECT: TSTF Response to NRC Questions on TSTF-563, "Revise Instrument Testing Definitions to Incorporate the Surveillance Frequency Control Program"

On October 5, 2017, the NRC provided by email a draft Request for Information (RAI) regarding TSTF-563, Revision 0, "Revise Instrument Testing Definitions to Incorporate the Surveillance Frequency Control Program." The questions were from the NRC Instrumentation and Control Branch (EICB). On November 8, 2017 and January 29, 2018, the NRC provided by email questions on TSTF-563 from the NRC PRA Licensing Branch (APLA). At the November 9, 2017 and February 15, 2018 TSTF/NRC public meetings, the draft RAIs were discussed. The TSTF agreed to respond to the draft RAIs without the NRC formally sending the documents.

The TSTF's response to the NRC questions is attached.

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



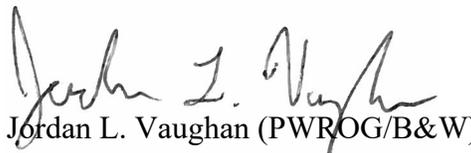
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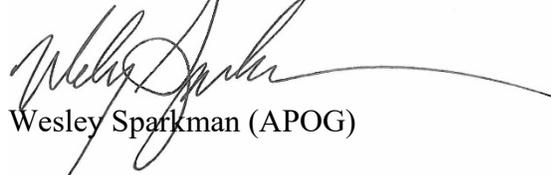
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The NRC comments are repeated below in italics, followed by the TSTF response.

By letter dated May 10, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17130A819), Technical Specifications Task Force (TSTF) requested Nuclear Regulatory Commission to review TSTF-563, "Revise Instrument Testing Definitions to Incorporate the Surveillance Frequency Control Program." The proposed traveler will revise the current technical specification instrumentation testing definitions to permit determination of the appropriate frequency to perform the surveillance requirement based on the devices being tested in each step, for those plants that have implemented a Surveillance Frequency Control Program. The current definitions, which require testing all devices based on the characteristics of the most limiting device, can result in over-testing, increased unavailability, and potentially higher personnel radiation dose.

In addition, TSTF-563 is applicable to all plant designs, including Babcock & Wilcox, Combustion Engineering, Westinghouse, General Electric, and Westinghouse AP1000 plants.

The Instrumentation & Controls Branch (EICB) staff has reviewed the traveler and requires additional information to complete the review. The additional information needed to complete the review is delineated below:

EICB-1:

Section 3 of TSTF-563 is titled Technical Evaluation. Part of first paragraph in this section states, "Therefore, prior to extending the test intervals for an instrument channel component or components associated with a given calibration step, the component performance characteristics must be evaluated to verify the Allowable Value or Nominal Trip Setpoint will still be valid and to establish a firm technical basis supporting the extension." State the criteria and the type of technical documentation that will be provided or used to perform this evaluation. Is this guidance document available? If so, please submit this guidance document for staff review. This information is needed to evaluate compliance to 10 CFR 50.36(c)(3).

Response

The guidance and criteria for evaluating a change to a surveillance frequency are given in the Technical Specifications (TS) Surveillance Frequency Control Program (SFCP), which requires the evaluation to be performed in accordance with NEI 04-10, Rev. 1. The documentation requirements are specified in NEI 04-10, Steps 4, 7, 10a, 10b, 10c, 12, 14, 15, and 16. For example, Step 7 of NEI 04-10, titled, "Identify Qualitative Considerations to be Addressed," states "Document that assumptions in the plant licensing basis would not be invalidated when performing the surveillance at the bounding interval limit for the proposed STI [Surveillance Test Interval] change."

One criterion applied when evaluating a change to a surveillance frequency is there can be no change to the TS limits, such as Allowable Values or Nominal Trip Setpoints¹. The

¹ Nominal trip setpoints are only TS limits in Westinghouse plant Standard Technical Specifications (NUREG-1431).

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SFCP only allows changes to frequencies that have been relocated to licensee control per adoption of TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b." If the frequency change evaluation performed in accordance with NEI 04-10, Rev. 1, determines that the proposed frequency would require a change to a TS limit, such as an Allowable Value or Nominal Trip Setpoint, the change cannot be made without prior NRC approval in accordance with 10 CFR 50.90.

Licensees with an SFCP may currently revise the testing frequency of instrumentation channels. The evaluations performed by licensees implementing TSTF-563 will be no different from those currently performed under the SFCP except for the scope of components in an instrument channel considered in an evaluation.

The NRC's Safety Evaluation for NEI 04-10, Rev. 1, concluded in Section 2, "Regulatory Evaluation," and Section 3.0, "Technical Evaluation," that 10 CFR 50.36(c)(3) would continue to be met following relocation of surveillance frequencies to licensee control and using the NEI 04-10 methodology to evaluate changes to surveillance frequencies. TSTF-563 allows the NEI 04-10, Rev. 1, methodology to be applied to subsets of a channel instead of the entire channel, but does not alter the technical approach that was approved by the NRC in NEI 04-10, Rev. 1, and TSTF-425. Therefore, 10 CFR 50.36(c)(3) continues to be met.

EICB-2

Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to accommodate a 24-Month Fuel Cycle," provided the guidance to change surveillance interval from 18-month to 24-month fuel cycle. It is conceivable that the surveillance interval for field transmitters may be further extended based on TSTF-563. For plants with 24-month fuel cycle the extension would be to 48 months (plus a 25% allowed extension period for a total of 60 months) because field transmitters are generally calibrated during refueling outages. What type of guidance will be provided to the licensees who use TSTF-563 with regard to historical data to support such large surveillance duration extensions? Will the guidance of GL 91-04 or an equivalent program be followed for such extensions? GL 91-04 is applicable for a relatively small increase of 33%, i.e. 18 to 24 months which is based on several years of data. Regardless of the methodology there should be sufficient data and acceptance criteria to justify large drift extension durations and other elements of accuracy.

Response

Changes to licensee-controlled setpoints are made in accordance with the licensee's setpoint control program following the requirements of 10 CFR 50.59, while ensuring that the TS Allowable Values or Nominal Trip Setpoints are met. As discussed in the response to EICB-1, licensees may not change TS Allowable Values or Nominal Trip Setpoints without prior NRC approval.

Generic Letter 91-04 provided guidance to licensees on the content of license amendment requests to extend fuel cycle testing requirements to accommodate 24-month fuel cycles.

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NEI 04-10, Rev. 1, and the accompanying TS changes in TSTF-425, Rev. 3, relocated periodic surveillance frequencies from the technical specifications to licensee control, and a license amendment request is no longer required to change the relocated surveillance frequencies. Therefore, the guidance in Generic Letter 91-04 is no longer applicable to plants that have adopted TSTF-425, as it has been superseded by the NRC-approved guidance in NEI 04-10, Rev. 1. NEI 04-10, Rev. 1, uses a risk-informed, performance-based approach for establishment of surveillance frequencies, consistent with the philosophy of NRC Regulatory Guide 1.174. Probabilistic Risk Assessment (PRA) methods are used to determine the risk impact of the revised frequencies. Sensitivity studies are performed on important PRA parameters. A multi-disciplinary plant decision making panel is utilized to evaluate determinations of revised surveillance frequencies, based on operating experience, test history, manufacturers' recommendations, codes and standards, and other factors, in conjunction with the risk insights from the PRA. Results and bases for the decision are documented.

The NEI 04-10, Rev. 1, methodology is used to evaluate surveillance frequency changes and existing frequencies are retained if the program is not applied. Process elements are included for determining the cumulative risk impact of the changes, updating the PRA, and for imposing corrective actions, if necessary, following implementation.

Step 7 of the frequency evaluation process requires consideration of qualitative factors including, but not limited to:

- Surveillance test and performance history of the components and system associated with the frequency change.
- Past industry and plant-specific experience with the functions affected by the proposed changes.
- Impact on defense-in-depth protection.
- Vendor-specified maintenance frequency.
- Test intervals specified in applicable industry codes and standards; e.g., ASME, IEEE, etc.
- Impact of a structure, system, or component (SSC) in an adverse or harsh environment.
- Benefits of detection at an early stage of potential mechanisms and degradations that can lead to common cause failures.
- Verifying that assumptions in the plant licensing basis would not be invalidated when performing the surveillance at the bounding interval limit.
- The degree to which the surveillance provides a conditioning exercise to maintain equipment operability, for example, lubrication of bearings or electrical contact wiping (cleaning) of built up oxidation.
- The existence of alternate testing of SSCs affected by the change.

TSTF-563 allows the NEI 04-10, Rev. 1, methodology to be applied to a subset of an instrument channel components instead of the entire channel when considering a frequency change. It does not alter the technical approach required by the SFCP that was approved by the NRC in NEI 04-10, Rev. 1, and TSTF-425. TSTF-563 makes no

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changes to the method of evaluating a surveillance frequency extension other than the scope of components considered in an evaluation.

EICB-3

In order to evaluate the acceptance of increased surveillance extension what success criteria will be used by licensees who adopt TSTF-563? Section 4.0 of NEI 04-10 states three (3) successive satisfactory performances after increased surveillance period when the surveillance period is 6 months or less and two (2) successive satisfactory performances when the surveillance period is greater than 6 months. Will this acceptance guidance be used? If so, what will be the determination if one of the readings during the acceptance evaluation exceeds the new TSTF-563 acceptable limits? Will the satisfactory performance criteria and successive satisfactory performance tests start again?

Response

The satisfactory performances referred to in Section 4.0 of NEI 04-10, Rev. 1, are the minimum number of successful tests that must be performed at a specific frequency before evaluating a longer frequency for the test under the SFCP. This is not an acceptance criterion.

The success criteria used to determine the acceptability of a proposed surveillance frequency are established in NEI 04-10, Rev. 1, and include both qualitative and quantitative considerations.

The success criteria for individual surveillance requirements are specified in the TS. NEI 04-10, Rev. 1, Step 18, requires monitoring of changed Surveillance Frequencies and Step 19, "Periodic Re-Assessment," states, "Surveillance failures are evaluated under the Corrective Action Program. STI adjustments under the SFCP may be an appropriate corrective action for a surveillance failure. In addition, for a previously extended STI, if unsatisfactory performances of the surveillance occur, then an assessment shall be performed to determine if the time interval between performances of the surveillance is a factor in the cause of the unsatisfactory performance of the surveillance." Step 20, "IDP [Independent Decisionmaking Panel] Reviews & Adjusts STI as Needed," states, "if it has been determined that the time interval between successive performances of a surveillance is a factor in the cause of unsatisfactory performances of the surveillance [...] the IDP shall return the STI back to the previously acceptable STI."

TSTF-563 allows the NEI 04-10, Rev. 1, methodology to be applied to a subset of instrument channel components instead of the entire channel. It does not alter the TS or NEI 04-10 success criteria.

EICB-4

There are several devices in an instrument loop which have to be accounted for in the calculation of setpoint or other calculations. The setpoint may not be impacted by a single device surveillance extension, but if the surveillance period of all or several devices in the loop is

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increased it is likely that the setpoints may change. What type of guidance is intended for the licensees with regard to revision of calculations when the surveillance period of one or more devices is increased as a result of using TSTF-563?

Response

The SFCP and NEI 04-10, Rev. 1, have no provisions to change licensee-controlled setpoints, or TS values such as Allowable Values or Nominal Trip Setpoints. If the surveillance frequency evaluation determines that the proposed frequency would require a change to a TS limit, the change cannot be made. If the proposed surveillance frequency change affects a licensee-controlled setpoint (i.e., not a TS limit), the licensee would perform the setpoint change following their procedures. TSTF-563 would not alter that process.

TSTF-563 allows the NEI 04-10, Rev. 1, methodology to be applied to a subset of instrument channel components instead of the entire channel when considering a frequency change. It does not alter the technical approach required by the SFCP that was approved by the NRC in NEI 04-10, Rev. 1, and TSTF-425. TSTF-563 makes no changes to the method of evaluating a surveillance frequency extension other than the scope of components considered in an evaluation.

The following questions were received from the NRC PRA Licensing Branch (APLA).

APLA-1

Staff is questioning whether NEI 04-10 could be used to the new TSTF-563 (ML17130A819). The proposed TSTF requests that each device in a loop can be calibrated based on the calibration interval for the subject device. Currently the calibration of a loop involves the entire loop including all instruments even though individual instruments can be calibrated separately or as part of full or partial loops. All devices, however, should be included as part of the loop. [A] lot of the field transmitters are calibrated at every refuel outage which may be 18 or 24 months.

With the proposed TSTF it is possible that the field transmitters be calibrated every other outage. They propose to use NEI 04-10 which was approved for use for the SFCP program and approval of TSTF-425. APLA is of the opinion that NEI 04-10 should not be used for TSTF-563 because it was specifically intended for use of TSTF-425.

Response

As stated in TSTF-563, Section 2.4, Description of the Proposed Change, only plants that have adopted an SFCP (i.e., TSTF-425) may adopt the proposed definition changes. Licensees that have adopted TSTF-425 and incorporated an SFCP in the Administrative Controls chapter of the TS are required to follow NEI 04-10, Rev. 1, when evaluating surveillance frequency changes. Licensees with an SFCP may currently revise the testing

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frequency of instrumentation channels. The proposed change provides an allowance to evaluate the surveillance intervals of component subsets within an instrumentation channel when performing an evaluation in accordance with NEI 04-10, Rev. 1. TSTF-563 will not alter the method of evaluating a change in surveillance frequency specified in the SFCP and NEI 04-10, Rev. 1.

TSTF-563 recognizes a difference between instrumentation Surveillance Requirements (Channel Calibration, Channel Function Test, Channel Operational Test, and Trip Actuating Device Operational Test) and other Surveillances. These instrumentation testing definitions state, "The [test type] may be performed by means of any series of sequential, overlapping, or total channel steps." In practice, this means that a channel is divided into subsets and each subset is tested separately (for example, in-containment devices, process racks, and comparator circuits may be tested at different times using different procedures). TSTF-563 allows the testing frequency of these subsets to be established based on the characteristics of the components in the subset rather than the limiting component characteristics in the entire channel. However, each of these subsets are evaluated in accordance with NEI 04-10, Rev. 1, and the Surveillance Frequency Control Program.

TSTF-563 is not a new use of NEI 04-10, Rev. 1. The proposed change modifies the licensee's adoption of TSTF-425 to address a specific situation related to instrument channel testing. It is consistent with the intent of TSTF-425. Therefore, it is an appropriate application of the NEI 04-10, Rev. 1, methodology.

Subsequent APLA Questions

TSTF-563 is changing the language in the Technical Specification Definitions regarding surveillances for Channel Calibration, Channel Functional Test, Channel Operational Test, and Trip Actuating Device Operational Test. This program will allow revision to the current surveillance requirements by allowing the licensee to adjust surveillances based on any components or group of components within the definition. This appears to change the surveillance requirement and or the process for testing channel components.

- a) *Summarize how component groupings will be selected such that the failure likelihood, and hence the appropriate surveillance interval, is applicable to the selected group (i.e., there are no unreliable components contained within a reliable group).*

Response

The current common industry practice is to perform instrument channel surveillances, such as Channel Calibrations and Channel Functional Tests, using separate procedures based on location of the components. For example, components located in the containment are tested using one procedure, components in the process racks are tested

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using another procedure, and trip functions and indicators are tested using other procedures. The results of all these procedures are used to satisfy the Surveillance Requirement using the existing allowance to perform it "by means of any series of sequential, overlapping, or total channel steps." The procedures used to satisfy a specific Surveillance Requirement must be performed on the same Frequency but may be performed at different times. It is expected that the components tested in a procedure would be evaluated as a channel subset to determine the appropriate frequency for performance of the procedure. Even if a subset is changed, all components in the channel must continue to be tested at an approved frequency. The testing frequency is based on the most limiting component in the channel subset. If an "unreliable" component is in a subset of relatively "more reliable" components, the testing frequency for that subset would be dictated by the least reliable component.

b) *How is this change to be included within the NEI 04-10 risk-informed framework?*

- I. *Can the effect of the proposed changes be reflected in the current approaches for modelling actuation signals in PRA? If not, how can the PRA models be adopted to measure the effect on risk to provide usable input into risk-informed decision making?*
- II. *If the PRA cannot currently, and cannot be modified to, reflect the effect on risk, (1) justify how this proposal is consistent with risk-informed decision making and (2) explain how the acceptable changes to the interval and/or the requirements will be selected.*

Response

An instrument function may be modeled in the PRA differently depending on the site and the function. Each component of the channel may be modeled individually, subsets may be modeled, or the channel function may be modeled as a single entity.

NEI 04-10, Rev. 1, Step 8, "Associated STI SSC Modeled in PRA?" would consider how the channel is modeled. The licensee must evaluate whether the PRA modeled components sufficiently represent the components uniquely impacted by the proposed frequency change. If so, the evaluation proceeds to Step 12 to determine the total and cumulative Core Damage Frequency (CDF) and Large Early Release Frequency (LERF).

If Step 8 determines the affected components are not sufficiently represented in the PRA, Step 9, "Can STI Be Modeled in PRA?," Step 10, "Perform Qualitative or Bounding Risk Analysis," and Step 11, "Revise PRA Model as Needed," are followed as directed. Step 10b provides the example of performing a bounding analysis for the SSCs not explicitly modeled in the PRA, but that are implicitly included in the model at the initiating event, mitigating system, or functional level (such as modeling a channel function as a single entity). The guidance states that a basic event (or basic events)

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associated with the initiating event, mitigating system, or function may be used as surrogate. If the bounding analysis does not demonstrate the frequency change is below the $1E-07$ /yr CDF and $1E-08$ /yr LERF limits, the proposed surveillance frequency can be adjusted, or the PRA model can be revised per Step 11.

In response to Question b.I, the proposed approach can be reflected in the current approaches for modelling actuation signals in the PRA. If the current PRA model does not allow explicit consideration of subsets of the channel, a bounding analysis may be performed, or the model may be revised to allow an explicit evaluation.

In response to Question b.II, if the PRA currently cannot model subsets of an instrument channel and cannot be modified to model the subsets of the channel, a bounding evaluation may be used, the proposed frequency may be revised and reevaluated, or the frequency change may be abandoned. These steps are consistent with the guidance in NEI 04-10, Rev. 1, and risk informed decision making which will ensure that only acceptable changes to the frequency will be implemented.