

1 **DRAFT SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

2 **TECHNICAL SPECIFICATIONS TASK FORCE Traveler**

3 **TSTF-563, REVISION 0**

4 **“REVISE INSTRUMENT TESTING DEFINITIONS TO INCORPORATE THE SURVEILLANCE**

5 **FREQUENCY CONTROL PROGRAM”**

6 **USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS**

7 **(CAC NO. MF9955, EPID L-2017-PMP-0006)**

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9
10 **1.0 INTRODUCTION**

11
12 By letter dated May 10, 2017 (Agencywide Documents Access and Management System
13 (ADAMS) Accession No. ML17130A819), the Technical Specifications Task Force (TSTF)
14 submitted Traveler TSTF-563, Revision 0, “Revise Instrument Testing Definitions to Incorporate
15 the Surveillance Frequency Control Program.” By letter dated April 27, 2018, the TSTF
16 responded to the U.S. Nuclear Regulatory Commission (NRC) staff requests for additional
17 information (RAIs) (ADAMS Accession No. ML18117A326). Traveler TSTF-563 proposes
18 changes to the Standard Technical Specifications (STS) for all plant designs, including
19 Babcock & Wilcox (B&W), Combustion Engineering (CE), Westinghouse, General Electric (GE),
20 and Westinghouse AP1000® plants. However, the NRC staff did not review and has not
21 approved this change for Westinghouse AP1000® plants. These changes will be incorporated
22 into future revisions of NUREG-1430, NUREG-1431, NUREG-1432, NUREG-1433, and
23 NUREG-1434.¹ This traveler will be made available to licensees for adoption through the
24 consolidated line item improvement process (CLIP).

25
26 The proposed changes would revise the current instrumentation testing definitions of Channel
27 Calibration, Channel Functional Test, Channel Operational Test (COT), and Trip Actuation
28 Device Operational Test (TADOT) to permit determination of the appropriate frequency to
29 perform the Surveillance Requirement (SR) based on the devices being tested in each step, for
30 those plants that have an approved Surveillance Frequency Control Program (SFCP) that uses

¹ U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, Babcock and Wilcox Plants,”
NUREG-1430, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession
Nos ML12100A177 and ML12100A178, respectively).

U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, Westinghouse Plants,” NUREG-1431,
Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession
Nos. ML12100A222 and ML12100A228, respectively).

U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, Combustion Engineering Plants,”
NUREG-1432, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession
Nos. ML12102A165 and ML12102A169, respectively).

U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, General Electric, BWR/4 Plants,”
NUREG-1433, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession
Nos. ML12104A192 and ML12104A193, respectively).

U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, General Electric BWR/6 Plants,”
NUREG-1434, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession
Nos. ML12104A195 and ML12104A196, respectively).

1 Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Method for Control of
2 Surveillance Frequencies," (ADAMS Accession No. ML071360456). NEI 04-10, Revision 1,
3 was approved by the NRC on September 19, 2007 (ADAMS Accession No. ML072570267).
4 Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control –
5 RITSTF [Risk-Informed TSTF] Initiative 5b," provided a model for incorporating an SFCP into
6 the STS. Traveler TSTF-425, Revision 3, was approved by the NRC staff on June 23, 2009
7 (ADAMS Accession No. ML090900716).

8 9 **2.0 REGULATORY EVALUATION**

10 11 **2.1 DESCRIPTION OF SURVEILLANCE FREQUENCY CONTROL PROGRAM AND** 12 **INSTRUMENT TESTING**

13
14 The STS state the surveillances for instrumentation channels to be performed within the
15 specified frequency, using any series of sequential, overlapping, or total channel steps.
16 Traveler TSTF-425 revised the TSs to relocate all periodic surveillance frequencies to licensee
17 control. Changes to the relocated surveillance frequencies are made in accordance with the TS
18 program referred to as the SFCP. The SFCP allows a new surveillance frequency to be
19 determined for the channel, but that frequency must consider all components in the channel and
20 applies to the entire channel.

21
22 A typical instrument channel consists of many different components, such as sensors, rack
23 modules, and indicators. These components have different short-term and long-term
24 performance (drift) characteristics, resulting in the potential for different calibration frequency
25 requirements. Under the current TSs, the most limiting component calibration frequency for the
26 channel must be chosen when a revised frequency is considered under the SFCP. As a result,
27 all components that make up a channel must be calibrated at a frequency equal to the channel
28 component with the shortest (i.e., most frequent) surveillance frequency.

29
30 Some channel components, such as pressure transmitters, are very stable with respect to drift
31 and could support a substantially longer calibration frequency than the other components in the
32 channel. Currently, the SRs in many plants are performed in steps (e.g., a pressure sensor or
33 transmitter is calibrated during a refueling outage and the rack signal conditioning modules are
34 calibrated while operating at power). The proposed change extends this concept to permit the
35 surveillance frequency of each step to be determined under the SFCP based on the
36 component(s) surveilled in the step instead of all components in the channel. This will allow
37 each component to be tested at the appropriate frequency based on the component's long-term
38 performance characteristics.

39
40 Allowing an appropriate surveillance frequency for performing a channel calibration on each
41 component or group of components could reduce radiation dose associated with in-place
42 calibration of sensors, reduce wear on equipment, reduce unnecessary burden on plant staff,
43 and reduce opportunities for calibration errors.

44 45 **2.2 PROPOSED CHANGES TO THE STANDARD TECHNICAL SPECIFICATIONS**

46
47 The proposed changes to the STS would revise the definitions of Channel Calibration, Channel
48 Functional Test, COT, and TADOT by adding the words " , and each step must be performed
49 within the Frequency in the Surveillance Frequency Control Program for the devices included in
50 the step" at the end of the last sentence of each definition.
51

1 The following paragraph denotes the changes to the Channel Calibration definition for all plant
2 designs (B&W, CE, GE, and Westinghouse plants, NUREG-1430 through NUREG-1434). The
3 Westinghouse plant definition (NUREG-1431) does not include the phrase shown in brackets
4 “and the CHANNEL FUNCTIONAL TEST.” Changes are shown in italics:

5
6 A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the
7 channel output such that it responds within the necessary range and accuracy to
8 known values of the parameter that the channel monitors. The CHANNEL
9 CALIBRATION shall encompass all devices in the channel required for channel
10 OPERABILITY[and the CHANNEL FUNCTIONAL TEST]. Calibration of
11 instrument channels with resistance temperature detector (RTD) or thermocouple
12 sensors may consist of an in-place qualitative assessment of sensor behavior and
13 normal calibration of the remaining adjustable devices in the channel. The
14 CHANNEL CALIBRATION may be performed by means of any series of
15 sequential, overlapping, or total channel steps [*and each step must be*
16 *performed within the Frequency in the Surveillance Frequency Control Program*
17 *for the devices included in the step*].
18

19 The following paragraph denotes the changes to the Channel Functional Test definition for
20 B&W, CE, and GE plant designs (NUREG-1430 and NUREG-1432 through NUREG-1434). In
21 the Westinghouse plant definition (NUREG-1431), the Channel Functional Test is replaced with
22 two tests: the COT and the TADOT. Changes are shown in italics:

23
24 ...The CHANNEL FUNCTIONAL TEST may be performed by means of any
25 series of sequential, overlapping, or total [channel] steps [*and each step must*
26 *be performed within the Frequency in the Surveillance Frequency Control*
27 *Program for the devices included in the step*].
28

29 The following paragraphs denote the changes of the COT and TADOT definitions for
30 Westinghouse plants (NUREG-1431). Changes are shown in italics:

31
32 A COT shall be the injection of a simulated or actual signal into the channel as
33 close to the sensor as practicable to verify OPERABILITY of all devices in the
34 channel required for channel OPERABILITY. The COT shall include
35 adjustments, as necessary, of the required alarm, interlock, and trip setpoints
36 required for channel OPERABILITY such that the setpoints are within the
37 necessary range and accuracy. The COT may be performed by means of any
38 series of sequential, overlapping, or total channel steps [*and each step must be*
39 *performed within the Frequency in the Surveillance Frequency Control Program*
40 *for the devices included in the step*].
41

42 A TADOT shall consist of operating the trip actuating device and verifying the
43 OPERABILITY of all devices in the channel required for trip actuating device
44 OPERABILITY. The TADOT shall include adjustment, as necessary, of the trip
45 actuating device so that it actuates at the required setpoint within the necessary
46 accuracy. The TADOT may be performed by means of any series of sequential,
47 overlapping, or total channel steps [*and each step must be performed within the*
48 *Frequency in the Surveillance Frequency Control Program for the devices*
49 *included in the step*].
50

1 The various instrumentation functions in the TSs require surveillances to verify the correct
2 functioning of the instrument channel. The proposed change extends the definition of
3 instrumentation channel components to permit the surveillance frequency of each step to be
4 determined under the SFCP based on the component(s) surveilled in the step instead of all
5 components in the channel. This will allow each component to be tested at the appropriate
6 frequency based on the component's long-term performance characteristics.

7
8 The proposed changes in the definition for instrument testing would allow the licensee to control
9 the frequency of associated components being tested in each step. The SR for the overall
10 instrumentation channel remains unchanged. The proposed change has no effect on the
11 design, fabrication, use, or methods of testing the instrumentation channels and will not affect
12 the ability of the instrumentation to perform the functions assumed in the safety analysis.

13
14 Traveler TSTF-563 distinguished between instrumentation SRs (Channel Calibration, Channel
15 Functional Test, COT, and TADOT) and other SRs. These instrumentation testing definitions
16 state that, "[t]he [test type] may be performed by means of any series of sequential, overlapping,
17 or total channel steps." Traveler TSTF-563 proposed the surveillance frequency of these
18 subsets to be established based on the characteristics of the components in the step rather than
19 the most limiting component characteristics in the entire channel. Each of these steps are
20 evaluated in accordance with the SFCP.

21 22 2.3 APPLICABLE REGULATORY REQUIREMENTS AND GUIDANCE

23
24 Section IV, "The Commission Policy," of the "Final Policy Statement on Technical Specifications
25 Improvements for Nuclear Power Reactors," published in the *Federal Register* on July 22, 1993
26 (58 FR 39132), states, in part:

27
28 The purpose of Technical Specifications is to impose those conditions or
29 limitations upon reactor operation necessary to obviate the possibility of an
30 abnormal situation or event giving rise to an immediate threat to the public health
31 and safety by identifying those features that are of controlling importance to
32 safety and establishing on them certain conditions of operation which cannot be
33 changed without prior Commission approval.

34
35 ...[T]he Commission will also entertain requests to adopt portions of the
36 improved STS [(e.g., TSTF-563)], even if the licensee does not adopt all STS
37 improvements. ...The Commission encourages all licensees who submit
38 Technical Specification related submittals based on this Policy Statement to
39 emphasize human factors principles.

40
41 ...In accordance with this Policy Statement, improved STS have been developed
42 and will be maintained for each NSSS [nuclear steam supply system] owners
43 group. The Commission encourages licensees to use the improved STS as the
44 basis for plant-specific Technical Specifications. ...[I]t is the Commission intent
45 that the wording and Bases of the improved STS be used ...to the extent
46 practicable.

47
48 As described in the Commission's "Final Policy Statement on Technical Specifications
49 Improvements for Nuclear Power Reactors," the NRC and industry task groups for new STS
50 recommend that improvements include greater emphasis on human factors principles in order to
51 add clarity and understanding to the text of the STS, and provide improvements to the Bases of

1 STS, which provides the purpose for each requirement in the specification. The improved
2 vendor-specific STS were developed and issued by the NRC in September 1992.

3
4 The regulation at Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(b)
5 requires:

6
7 Each license authorizing operation of a ...utilization facility ...will include
8 technical specifications. The technical specifications will be derived from the
9 analyses and evaluation included in the safety analysis report, and amendments
10 thereto, submitted pursuant to [10 CFR] 50.34 ["Contents of applications;
11 technical information"]. The Commission may include such additional technical
12 specifications as the Commission finds appropriate.

13
14 The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). One such
15 category is SRs, which are defined in 10 CFR 50.36(c)(3) as "requirements relating to test,
16 calibration, or inspection to assure that the necessary quality of systems and components is
17 maintained, that facility operation will be within safety limits, and that the limiting conditions for
18 operation will be met."

19
20 The regulation at 10 CFR 50.36(c)(5) requires TSs to include administrative controls, which "are
21 the provisions relating to organization and management, procedures, recordkeeping, review and
22 audit, and reporting necessary to assure operation of the facility in a safe manner."

23
24 Traveler TSTF-425 revised and relocated most periodic surveillance frequencies to licensee
25 control. Changes to the relocated surveillance frequencies are made in accordance with the
26 SFCP. The SFCP requires that changes to the relocated frequencies be made in accordance
27 with the NRC staff approved topical report NEI 04-10.

28
29 Topical report NEI 04-10 describes an evaluation process and a multi-disciplinary plant
30 decisionmaking panel that considers the detailed evaluation of proposed surveillance frequency
31 revisions. The evaluations are based on operating experience, test history, manufacturers'
32 recommendations, codes and standards, and other deterministic factors, in conjunction with risk
33 insights. The evaluation considers all components being tested by the SR. Process elements
34 are included for determining the cumulative risk impact of the changes, updating the licensee's
35 probabilistic risk assessment (PRA) models, and for imposing corrective actions, if necessary,
36 following implementation of a revised frequency.

37
38 The NRC staff's guidance for the review of TSs is in Chapter 16.0, "Technical Specifications," of
39 NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for
40 Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP), March 2010 (ADAMS
41 Accession No. ML100351425). As described therein, as part of the regulatory standardization
42 effort, the NRC staff has prepared STS for each of the LWR nuclear designs. Accordingly, the
43 NRC staff's review includes consideration of whether the proposed changes are consistent with
44 the applicable reference STS (i.e., the current STS), as modified by NRC-approved Travelers.
45 In addition, the guidance states that comparing the change to previous STS can help clarify the
46 TS intent.

47
48 Regulatory Guide (RG) 1.174, Revision 2, "An Approach for Using Probabilistic Risk
49 Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"
50 (ADAMS Accession No. ML100910006), describes an acceptable risk-informed approach for
51 assessing the nature and impact of proposed permanent licensing basis changes by

1 considering engineering issues and applying risk insights. This regulatory guide also provides
2 risk acceptance guidelines for evaluating the results of such evaluations.

3
4 RG 1.177, Revision 1, “An Approach for Plant-Specific, Risk-Informed Decisionmaking:
5 Technical Specifications” (ADAMS Accession No. ML100910008), describes an acceptable
6 risk-informed approach specifically for assessing proposed TS changes.

7
8 RG 1.200, “An Approach for Determining the Technical Adequacy of Probabilistic Risk
9 Assessment Results for Risk-Informed Activities” (ADAMS Accession No. ML090410014),
10 describes an acceptable approach for determining the technical adequacy of PRAs.

11
12 The NRC staff’s guidance for evaluating the technical basis for proposed risk-informed
13 changes is provided in SRP, Chapter 19, Section 19.2, “Review of Risk Information Used to
14 Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance”
15 (ADAMS Accession No. ML071700658). The NRC staff’s guidance on evaluating PRA
16 technical adequacy is provided in SRP, Chapter 19, Section 19.1, Revision 3, “Determining the
17 Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed License Amendment
18 Requests After Initial Fuel Load” (ADAMS Accession No. ML12193A107). More specific
19 guidance related to risk-informed TS changes is provided in SRP, Chapter 16, Section 16.1,
20 Revision 1, “Risk-Informed Decision Making: Technical Specifications” (ADAMS Accession
21 No. ML070380228), which includes changes to surveillance test intervals (STIs) (i.e.,
22 surveillance frequencies) as part of risk-informed decisionmaking. Section 19.2 of the SRP
23 references the same criteria as RG 1.177, Revision 1, and RG 1.174, Revision 2, and states
24 that a risk-informed application should be evaluated to ensure that the proposed changes meet
25 the following key principles:

- 26
- 27 • The proposed change meets the current regulations, unless it explicitly relates to a
28 requested exemption or rule change.
 - 29
 - 30 • The proposed change is consistent with the defense-in-depth philosophy.
 - 31
 - 32 • The proposed change maintains sufficient safety margins.
 - 33
 - 34 • When proposed changes result in an increase in risk associated with core damage
35 frequency or large early release frequency, the increase(s) should be small and
36 consistent with the intent of the Commission’s Safety Goal Policy Statement.
 - 37
 - 38 • The impact of the proposed change should be monitored using performance
39 measurement strategies.
 - 40

41 **3.0 TECHNICAL EVALUATION**

42
43 Revising the frequency of a Channel Calibration, Channel Functional Test, COT, and TADOT
44 instrument channel under the SFCP requires assurance that component performance
45 characteristics, such as drift between each test, will not result in undetected instrument errors
46 that exceed the assumptions of the safety analysis and supporting instrument loop uncertainty
47 calculations. These requirements are consistent with the methodology described in NEI 04-10,
48 which the SFCP requires to be followed. The SFCP does not permit changes to the TS
49 Allowable Values or Nominal Trip Setpoints; but allows only the surveillance frequency to be
50 changed when determined permissible by NEI 04-10. Therefore, prior to extending the test

1 intervals for an instrument channel component or components associated with a given
2 calibration step, the component performance characteristics must be evaluated to verify the
3 Allowable Value or Nominal Trip Setpoint will still be valid and to establish a firm technical basis
4 supporting the extension. In addition, each change must be reviewed by the licensee to ensure
5 the applicable uncertainty allowances are conservative (bounding) (e.g., sensor drift, rack drift,
6 indicator drift). Documentation to support the changes shall be retained per the guidance in
7 NEI 04-10.
8

9 In response to the NRC staff RAI, the TSTF identified that Section 4.0 of NEI 04-10, Steps 4, 7,
10 10a, 10b, 10c, 12, 14, 15, and 16, document the requirements pertaining to changing the SRs.
11 As an example, Step 4 requires documenting when STIs cannot be changed. These guidelines
12 include qualitative and quantitative measures to assess the acceptability of the change. Since
13 Traveler TSTF-425 and NEI 04-10 have been previously approved by the NRC, the explanation
14 provided is satisfactory and acceptable to NRC staff.
15

16 Five key safety principles that must be evaluated before changing any surveillance frequency
17 are identified in Section 3.0 of NEI 04-10. Principle 3 requires confirmation of the maintenance
18 of safety margins, which, in this case, includes performance of deterministic evaluations to
19 verify preservation of instrumentation trip setpoint and indication safety margins.
20

21 The evaluation methodology specified in NEI 04-10 also requires consideration of common
22 cause failure effects and monitoring of the instrument channel component performance
23 following the frequency change to ensure channel performance is consistent with the analysis to
24 support an extended frequency.
25

26 The method of evaluating a proposed surveillance frequency change is not dependent on the
27 number of components in the channel. Each step needs to be evaluated to determine the
28 acceptable surveillance frequency for that step. The proposed change to permit changing the
29 surveillance frequency of channel component(s) does not affect the test method or evaluation
30 method. The requirement to perform a Channel Calibration, Channel Functional Test, COT, or
31 TADOT on the entire channel is not changed.
32

33 For example, an evaluation in accordance with NEI 04-10 may determine that a field sensor
34 (e.g., a transmitter) should be calibrated every 48 months, the rack modules should be
35 calibrated every 30 months, and the indicators should be calibrated every 24 months. Under
36 the current TS requirements, all devices in the channel must be calibrated every 24 months.
37 However, under the proposed change, sensors, rack modules, and indicators would be
38 calibrated at the appropriate frequency for the tested devices. As required by the Channel
39 Calibration definition, the test would still encompass all devices in the channel required for
40 channel operability.
41

42 To address the issue of a potential extension of up to 48 months for field transmitters, the NRC
43 staff requested clarification regarding adequate data to support such long SR extensions. The
44 TSTF stated in the RAI response that NEI 04-10 methodology is used to evaluate surveillance
45 frequency changes to determine if such SR extensions could be applied. Process elements are
46 used to determine the cumulative risk impact of changes, updating the PRA, and imposition of
47 corrective actions, if needed, following implementation. Further, the applicant pointed to several
48 steps required by NEI 04-10, Step 7, to be evaluated prior to determining the acceptability of
49 changes. These steps include history of surveillance tests, industry and plant specific history,
50 impact on defense-in-depth, vendor recommendations, required test frequencies for the
51 applicable codes and standards, ensuring that the plant licensing basis would not be

1 invalidated, and other factors. The NRC staff finds these measures acceptable in determining
2 the SR extensions.

3
4 The NRC staff requested further information regarding the cumulative effect of various changes
5 on potential setpoint changes. The TSTF responded with the following:

6
7 The SFCP and NEI 04-10, Rev. 1, have no provisions to change
8 licensee-controlled setpoints, or TS values such as Allowable Values or Nominal
9 Trip Setpoints. If the surveillance frequency evaluation determines that the
10 proposed frequency would require a change to a TS limit, the change cannot be
11 made. If the proposed surveillance frequency change affects a
12 licensee-controlled setpoint (i.e., not a TS limit), the licensee would perform the
13 setpoint change following their procedures. TSTF-563 would not alter that
14 process.

15
16 TSTF-563 allows the NEI 04-10, Rev. 1, methodology to be applied to a subset
17 of instrument channel components instead of the entire channel when
18 considering a frequency change. It does not alter the technical approach
19 required by the SFCP that was approved by the NRC in NEI 04-10, Rev. 1, and
20 TSTF-425. TSTF-563 makes no changes to the method of evaluating a
21 surveillance frequency extension other than the scope of components considered
22 in an evaluation.

23
24 In addition, Step 16 of Section 4.0 of NEI 04-10 requires an Independent Decisionmaking Panel
25 (IDP) to review the cumulative impact of all STI changes over a period of time. This is also
26 required by RGs 1.174 and 1.177. The IDP is comprised of the site Maintenance Rule Expert
27 Panel, Surveillance Test Coordinator, and Subject Matter Expert who is a cognizant system
28 manager or component engineer. Based on the above information, the NRC staff finds that the
29 setpoint changes will be tracked in an acceptable manner.

30
31 The NRC staff reviewed the justification for the proposed revision to the instrumentation channel
32 definitions to ensure the request did not propose a change beyond the scope of NEI 04-10. In
33 response to the RAIs, the TSTF stated:

34
35 As stated in TSTF-563, Section 2.4, Description of the Proposed Change, only
36 plants that have adopted an SFCP (i.e., TSTF-425) may adopt the proposed
37 definition changes.

38
39 The NRC staff notes that limiting the proposed changes to licensees who have an approved
40 SFCP, allows for appropriate implementation of the program by incorporating NEI 04-10,
41 Revision 1, by reference into the Administrative Controls section of TSs.

42
43 Licensees with an SFCP may currently revise the surveillance frequency of instrumentation
44 channels. The testing of these channels may be performed by means of any series, sequential,
45 overlapping, or total channel steps. However, all required components in the instrumentation
46 channel must be tested in order for the entire channel to be considered Operable.

47
48 The NRC staff notes that industry practice is to perform instrument channel surveillances, such
49 as Channel Calibrations and Channel Functional Tests, using separate procedures based on
50 the location of the components. Each of these procedures may be considered a "step." The
51 results of all these procedures are used to satisfy the SR using the existing allowance to

1 perform the SR “by means of any series of sequential, overlapping, or total channel steps.”
2 Traveler TSTF-563 allows for determining an acceptable surveillance frequency for each step.
3 As stated by the TSTF in the RAI response:
4

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

10
11 In response to Question b.II, if the PRA currently cannot model subsets of an
12 instrument channel and cannot be modified to model the subsets of the channel,
13 a bounding evaluation may be used, the proposed frequency may be revised and
14 reevaluated, or the frequency change may be abandoned. These steps are
15 consistent with the guidance in NEI 04-10, Rev. 1, and risk informed decision
16 making which will ensure that only acceptable changes to the frequency will be
17 implemented.
18

19 The NRC staff notes that the NEI 04-10 methodology includes the determination of whether the
20 structure, system, and components (SSCs) affected by a proposed change to a surveillance
21 frequency are modeled in the PRA. Where the SSC is directly or implicitly modeled, a
22 quantitative evaluation of the risk impact may be carried out. The methodology adjusts the
23 failure probability of the impacted SSCs based on the proposed change to the surveillance
24 frequency. Where the SSC is not modeled in the PRA, bounding analyses are performed to
25 characterize the impact of the proposed change to the surveillance frequency. Potential
26 impacts on the risk analyses due to screening criteria and truncation levels are addressed by
27 the requirements for PRA technical adequacy, consistent with the guidance contained in
28 RG 1.200, and by sensitivity studies identified in NEI 04-10. Traveler TSTF-563 is not
29 proposing to change the methodology or the acceptance criteria for extending STIs, and
30 licensees will need to evaluate changes in the frequency for performing each of the steps in
31 the instrumentation surveillance test per the methodology in NEI 04-10.
32

33 Therefore, the NRC staff concludes that the proposed change to determine an acceptable
34 test frequency for individual steps within instrumentation channel surveillance tests is
35 acceptable, because any extended STIs from applying Traveler TSTF-563 will be developed
36 within the established constraints of the SFCP and NEI 04-10.
37

38 The regulatory requirements in 10 CFR 50.36 are not specific regarding the frequency of
39 performing surveillance tests. The proposed change only affects the frequency of performance
40 and does not affect the surveillance testing method or acceptance criteria. Therefore, the
41 proposed change is consistent with the surveillance testing requirements of 10 CFR 50.36.
42

43 PRA Acceptability 44

45 The guidance in RG 1.200 states that the quality of a licensee’s PRA should be commensurate
46 with the safety significance of the proposed TS change and the role the PRA plays in justifying
47 the change. That is, the greater the change in risk or the greater the uncertainty in that risk as a
48 result of the requested TS change, or both, the more rigor that should go into ensuring the
49 quality of the PRA.
50

1 Use of Traveler TSTF-563 by a licensee requires NRC's prior approval of the licensee's request
2 to an SFCP that uses NEI 04-10. As part of its evaluation of that request, the NRC staff will
3 have performed an assessment of the PRA models used to support the approved SFCP that
4 uses NEI 04-10, using the guidance of RG 1.200 to assure that the PRA models are capable of
5 determining the change in risk due to changes to surveillance frequencies of SSCs, using
6 plant-specific data and models. Capability Category II of the NRC-endorsed PRA standard is
7 the target capability level for supporting requirements for the internal events PRA for this
8 application. Any identified deficiencies to those requirements are assessed further to determine
9 any impacts to proposed decreases to surveillance frequencies, including the use of sensitivity
10 studies where appropriate, in accordance with NEI 04-10.

11
12 Traveler TSTF-425 permits revising of the surveillance frequency for instrumentation channels.
13 The NRC staff asked the TSTF how NEI 04-10 can be applied to subsets in an instrument
14 channel when the SFCP currently specifies a surveillance interval that is applied to the entire
15 channel. The TSTF stated in its RAI response that the current channel surveillance "may be
16 performed by means of any series of sequential, overlapping, or total channel steps. In
17 practice, this means that a channel is divided into subsets and each subset is tested
18 separately...." Therefore, the current instrument channel testing is already composed of a
19 sequence of individual tests.

20
21 The NRC staff also requested the TSTF to clarify how the NEI 04-10 methodology can be
22 applied to the variety of current approaches for modeling actuation instrument channels in
23 PRAs. In the response to the RAI the TSTF stated that "[a]n instrument function may be
24 modeled in the PRA differently depending on the site and the function" (e.g., channel may be
25 modeled individually, subsets may be modeled, or the channel function may be modeled as a
26 single entity). The TSTF identified different steps through the evaluation methodology in
27 NEI 04-10 that could be used based on the different PRA modeling approaches. The
28 appropriate modeling of these different approaches is included in the NRC staff's review of the
29 PRA modeling during the review of the application to implement an SFCP.

30
31 Licensees who adopt Traveler TSTF-563 will use a PRA that was used to support the adoption
32 of Traveler TSTF-425 or an approved SFCP that uses NEI 04-10. Traveler TSTF-563 will give
33 licensees the capability to change the surveillance frequency of individual steps in the Channel
34 Calibration, Channel Functional Test, COT, and TADOT for instrumentation. The NRC staff
35 finds that changes to the surveillance frequency for individual steps can be appropriately
36 evaluated with the current SFCP and the current PRAs. The NRC staff finds that the
37 risk-informed methodology review and the PRA acceptability review that NRC staff performs
38 during approval of an SFCP that uses NEI 04-10 will be adequate to allow the adoption of
39 Traveler TSTF-563, and therefore, the NRC staff finds the proposed traveler acceptable for
40 use by plants that have an approved SFCP.

41 42 **4.0 CONCLUSION**

43
44 The NRC staff reviewed Traveler TSTF-563, which proposed changes to NUREG-1430,
45 NUREG-1431, NUREG-1432, NUREG-1433, and NUREG 1434. The NRC staff determined
46 that the proposed changes to the STS meet the standards for TSs in 10 CFR 50.36(b). The
47 regulations at 10 CFR 50.36 require that TSs include items in specified categories, including
48 SRs. The proposed changes modify the definitions applicable to instrumentation channel
49 components but do not alter the technical approach that was approved by the NRC staff in
50 NEI 04-10 and Traveler TSTF-425, and the TS, as revised, continue to specify the appropriate
51 SRs for tests and inspections to ensure the necessary quality of affected SSCs is maintained.

1
2 Additionally, the changes to the STS were reviewed and found to be technically clear and
3 consistent with customary terminology and format in accordance with SRP Chapter 16.0. The
4 NRC staff reviewed the proposed changes against the regulations and concludes that the
5 changes continue to meet the requirements of Sections 50.36(b), 50.36(c)(3), and 50.36(c)(5)
6 of 10 CFR, for the reasons discussed above, and thus provide reasonable assurance that
7 adoption of these TSs will have the requisite requirements and controls to operate safely.
8 Therefore, the NRC staff concludes that the proposed TS changes are acceptable.

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14 Date: September 20, 2018