**TSTF Input to Lifting the Suspension of Acceptance of Amendment Requests to Adopt TSTF-51, TSTF-471, and TSTF-286**

At the February 15, 2018 TSTF/NRC meeting, the NRC and TSTF discussed resolving the NRC staff's questions on TSTF-51, "Revise Containment Requirements During Handling of Irradiated Fuel and Core Alterations," TSTF-286, "Operations Involving Positive Reactivity Additions," and TSTF-471, "Eliminate Use of Term Core Alterations in Actions and Notes."

Prior to the meeting, the NRC staff shared a draft letter to facilitate the discussion. The letter would lift the suspension of acceptance of license amendment requests to adopt TSTF-51, -471, and -286. The draft letter states that licensees should provide the following information in their license amendment requests:

- Information describing the licensee's evaluation of "recently" irradiated fuel that demonstrates that after sufficient radioactive decay has occurred (from the time of shutdown) that the onsite and offsite radiological doses resulting from a [Fuel Handling Accident] FHA remain below the regulatory limits and the regulatory guidance limits, and;

This guidance is currently in TSTF-51. TSTF-51 predated the provision of model applications, so the requirement was included in the ISTS Bases as a Reviewer's Note in Revision 1. It states:

> The addition of the term "recently" associated with handling irradiated fuel in all of the containment function Technical Specification requirements is only applicable to those licensees who have demonstrated by analysis that after sufficient radioactive decay has occurred, off-site doses resulting from a fuel handling accident remain below the Standard Review Plan limits (well within 10 CFR 100).

<u>Recommendation</u>

To be clearer, we recommend that this portion of the draft letter be revised to reflect that the requirement exists in TSTF-51, and the wording be revised to more closely model the language in TSTF-51.

The draft letter also stated:

- Traditionally, the worst case FHA of record (i.e., the drop of an irradiated fuel assembly and fuel handling tool onto an irradiated fuel assembly) has produced the highest resultant radiological dose at the onsite and offsite boundaries, which bounds the resultant radiological doses from lesser events. Licensees will need to review their plant-specific operating procedures and design basis documents and confirm that the proposed changes in TSTF-51 and/or TSTF-471 will not cause the resultant radiological doses at the onsite and offsite boundaries from dropping a load during core alterations to exceed those recorded in the FHA of record. The licensee's review should take into account only those safety systems required to be operable by the proposed technical specifications. If the resultant radiological doses mentioned above exceed those recorded in the FHA of record, then an additional licensing basis change will be required in order to adopt TSTF-51 and/or TSTF-471, which should be included in the TSTF-51 and/or TSTF-471 license amendment request.

During a teleconference held on May 16, 2018, the NRC clarified the concern. The staff is concerned with the portion of TSTF-51 and TSTF-471 that removes the term "Core Alterations" from the applicability of various specifications. From the period after shutdown and the removal of the reactor vessel head and upper internals, exposing the reactor fuel, until the period defined as "recently" when mitigating equipment is no longer required, there exists a vulnerability if a load other than recently irradiated fuel is dropped on the fuel in the reactor. Without the Applicability of "Core Alterations," no mitigating systems are required to be operable except during movement of recently irradiated fuel. If a load, such as a unirradiated fuel assembly, is dropped and damages the irradiated fuel in the vessel without mitigating equipment being required to be operable, there is the potential for exceeding the dose limits. The TSTF acknowledged the concern and agreed to address it.

In order to determine the scope of the concern, the TSTF surveyed the licensees that have adopted TSTF-51. If the period after shutdown defined as "recently" is less than the time required to remove the reactor head and vessel internals after shutdown, there is no vulnerability to the dropping of a load that might require mitigation (i.e., dropping of an irradiated fuel assembly onto another irradiated fuel assembly is the limiting dose consequences and TSTF-51 requires demonstration that mitigation is not required for this event to meet the regulatory limits.)

Twenty sites responded to the survey. All of the Boiling Water Reactor (BWR) sites defined "recently" as 24 hours (except for a longer period defined for one specification at one site). Twenty-four hours is much shorter than the period after shutdown to cool down and remove the reactor head and vessel internals (typically 2-3 days). The Pressurized Water Reactor (PWR) site definitions of "recently" varied, with a median value of 82 hours, which is still less than the typical time required for a PWR to expose the fuel.

From the survey we concluded that many plants requesting adoption of TSTF-51 and TSTF-471 can respond to the staff's concern by confirming that the period of "recently" is less than the time required to expose the irradiated fuel after a shutdown.

For those plants with a calculated value of "recently" that could result in exposure of irradiated fuel, there are several options to respond to the staff's concern:

- Provide an analysis that demonstrates that the dropping of any unirradiated fuel assembly, source, reactivity control component, or other component affecting reactivity within the reactor vessel onto irradiated fuel assemblies prior to the period of time defined as "recently" will not result in a radioactive release from the irradiated fuel;

- Describe the limitations or controls that would prevent movement of any unirradiated fuel assembly, source, reactivity control component, or other component affecting reactivity within the reactor vessel capable of damaging a fuel assembly prior to the time period defined as "recently;" or

- Perform and provide to the NRC in the license amendment request an analysis that demonstrates that the dose consequences from a failure of a single irradiated fuel

> assembly with no TS-required mitigation systems available remain below the regulatory limits and the regulatory guidance limits for a fuel handling accident.

The control of movement of loads heavier than a fuel assembly over irradiated fuel is described in licensee responses to Generic Letter 81-07, "Control of Heavy Loads," which references NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The NRC pointed out that some licensees analyze the dropping of a heavy load onto irradiated fuel in Chapter 15 (or equivalent) of their UFSAR. Those plants must analyze dropping of a heavy load as part of adopting TSTF-51. The TSTF agrees and recommends that this caveat be included in the letter.

Recommendation

We recommend that the draft letter be revised to reflect the options discussed above.

Recommended changes to the draft letter are attached.

TSTF-286

The TSTF agreed to revise the actions for an inoperable source range detector to address the NRC staff concerns with TSTF-286. TSTF-571-T, "Revise Actions for Inoperable Source Range Neutron Flux Monitor," is attached for information. TSTF-286 will be annotated on the TSTF's website indicating that licensees adopting TSTF-286 must also include the changes in TSTF-571-T. The TSTF recommends that TSTF-571-T be incorporated into the next revision of the STS.

Other Considerations

In reviewing the responses to the survey, the TSTF noticed that several plant's amendments were not consistent with the approved travelers, such as adding a Section 1.1 definition for "recently irradiated," defining "recently" in the Applicability of the affected TS, or reintroducing a specification for "Decay Time." These changes are inconsistent with the Standard Technical Specifications and with the NRC's review guidance in Standard Review Plan, Chapter 16, "Technical Specifications," which states, "The proposed TS are reviewed for whether content and format are consistent with the applicable reference TS (the current STS, the certified generic TS, or both). Special attention is given to TS provisions that depart from the reference TS to determine whether proposed differences are justified by uniqueness in plant design or other considerations so that 10 CFR 50.36 is met." The deviations from the travelers we identified are not justified by the uniqueness of the plant design and the staff has previously determined that the changes meet 10 CFR 50.36. Therefore, we request that the NRC ensure that reviewers do not request changes to the proposed license amendments that are inconsistent with the travelers and the standard TS.

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

SUBJECT: PLANT-SPECIFIC ADOPTION OF TRAVELERS TSTF-51, REVISION 2, "REVISE CONTAINMENT REQUIREMENTS DURING HANDLING IRRADIATED FUEL AND CORE ALTERATIONS," TSTF-286, REVISION 2, "OPERATIONS INVOLVING POSITIVE REACTIVITY ADDITIONS," AND TSTF-471, REVISION 1, "ELIMINATE USE OF TERM CORE ALTERATIONS IN ACTIONS AND NOTES"

Dear Members of the Technical Specifications Task Force:

By letter dated November 7, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13246A358), the U.S. Nuclear Regulatory Commission (NRC) staff identified potential operating issues with the continued adoption of the subject travelers related to core monitoring instrumentation and dose consequences. It was suggested in the letter that licensees not submit amendments to adopt these three Travelers until a final resolution was achieved.

After considerable review and analysis, NRC staff concludes that for certain facilities, license amendment requests (LARs) adopting TSTF-51 and TSTF-471 could result in exceeding the bounding licensing basis Fuel Handling Accident (FHA) analysis of record dose for the control room and is therefore considered an unanalyzed condition.

{Comment: This paragraph is not needed. The FHA is only affected by TSTF-51. The traveler requires providing an analysis to support "recently," which will demonstrate that the radiological limits are met. There are no non-radiological limits for the FHA. Some of the information is moved the bullet below.}

To minimize the potential for being requested to provide needed information under existing requirements and guidance, licensees adopting TSTF-51 and TSTF-471 are reminded that their application should include the following information to support the NRC staff's review of the requested changes:

- As described in the Reviewer's Note incorporated by TSTF-51 into the Standard Technical Specifications, information describing the licensee's evaluation of "recently" irradiated fuel that demonstrates that after sufficient radioactive decay has occurred (from the time of shutdown) that the onsite and offsite radiological doses resulting from a FHA remain below the regulatory limits (well within 10 CFR 100) without crediting the systems not required to be operable is to be provided. The licensee should describe the radiological analysis assumptions, inputs, and methods in sufficient detail to support review by the NRC staff. Licensees whose licensing basis includes analysis of the dropping of a heavy load onto irradiated fuel in Chapter 15 (or equivalent) of their UFSAR must analyze dropping of a heavy load as part of adopting TSTF-51.

In addition to the information requested in TSTF-51, the NRC staff requests that one of the following discussions be provided for specifications revised to remove the defined term "core alterations" from their Applicability:

- Confirm that the length of time defined as "recently" is less than the time required to remove the reactor vessel head and internals and expose the irradiated fuel after a shutdown;

- Provide an analysis that demonstrates that the dropping of any unirradiated fuel assembly, sources, reactivity control component, or other component affecting reactivity within the reactor vessel onto irradiated fuel assemblies prior to the period of time defined as "recently" will not result in a radioactive release from the irradiated fuel;

- Describe the limitations or controls that would prevent movement of any unirradiated fuel assembly, source, reactivity control component, or other component affecting reactivity within the reactor vessel capable of damaging a fuel assembly prior to the time period defined as "recently;" or

- Provide an analysis that demonstrates that the dose consequences of a failure of a single irradiated fuel assembly with no TS-required mitigation systems available remain below the regulatory limits and the regulatory guidance limits for a fuel handling accident.

Provided that the above information is satisfactorily addressed, the NRC staff has determined that their concerns can be addressed without any changes needed to the travelers.

**TSTF-571-T, Revise Actions for Inoperable Source Range Neutron Flux Monitor**

# Technical Specifications Task Force
# Improved Standard Technical Specifications Change Traveler

**Revise Actions for Inoperable Source Range Neutron Flux Monitor**

NUREGs Affected: ☑ 1430 ☑ 1431 ☑ 1432 ☐ 1433 ☐ 1434 ☑ 2194

Classification: 1) Technical Change

Recommended for CLIIP?: Yes

Correction or Improvement: Correction

NRC Fee Status:

Changes Marked on ISTS Rev: 4.0

See attached.

## Revision History

### OG Revision 0 Revision Status: Active

Revision Proposed by: TSTF

Revision Description:
Original Issue

## Affected Technical Specifications

| | | |
|---|---|---|
| Action 3.9.2 | Nuclear Instrumentation | NUREG(s)- 1430 1432 Only |
| Action 3.9.2 Bases | Nuclear Instrumentation | NUREG(s)- 1430 1432 Only |
| Action 3.9.3 | Nuclear Instrumentation | NUREG(s)- 1431 2194 Only |
| Action 3.9.3 Bases | Nuclear Instrumentation | NUREG(s)- 1431 2194 Only |

## 1. SUMMARY DESCRIPTION

The proposed change revises the Required Actions for an inoperable source range neutron flux monitor (SRM) to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. A provision is included to allow such movement if it is needed to repair the SRM. The proposed changes ensure that no actions are taken that could alter the core reactivity when an SRM is inoperable.

The proposed change is applicable to the Standard Technical Specifications for Babcock & Wilcox, Westinghouse, Combustion Engineering, and AP1000 plants, provided in NUREG-1430, NUREG-1431, NUREG-1432, and NUREG-2914, respectively.

## 2. DETAILED DESCRIPTION

### 2.1. System Description and Operation

The SRMs are used during refueling operations to monitor the core reactivity condition. These detectors are located external to the reactor vessel and detect neutrons leaking from the core. Depending on the plant design, the use of portable detectors is permitted, provided the LCO requirements are met.

The installed SRMs are BF3 detectors operating in the proportional region of the gas filled detector characteristic curve. The detectors monitor the neutron flux in counts per second. The instrument range typically covers six decades of neutron flux (1E+6 cps). The detectors also provide continuous visual indication in the control room and an audible alarm to alert the operators.

In MODE 6, the SRMs must be operable to determine changes in core reactivity. There is no other direct means available to monitor core reactivity levels. Depending on the plant design and licensing basis, the SRMs may be credited for alerting the operator to a boron dilution accident in time to mitigate the event.

## 3. CURRENT TECHNICAL SPECIFICATIONS REQUIREMENTS

The "Nuclear Instrumentation" specification, TS 3.9.2 in NUREG-1430 and NUREG-1432, and TS 3.9.3 in NUREG-1431 and NUREG-2194, is applicable in Mode 6. The specification requires two SRMs to be operable.

If one SRM is inoperable, the Actions require:

- Immediate suspension of positive reactivity additions, and
- Immediate suspension of operations that would introduce coolant into the Reactor Coolant System (RCS) with a boron concentration less than the limit in LCO 3.9.1.

LCO 3.9.1, "Boron Concentration," specifies the minimum RCS boron concentration in Mode 6.

## 4. REASON FOR THE PROPOSED CHANGE

In Revision 0 of the STS, the Required Actions to be taken when an SRM is inoperable were to immediately suspend core alterations and positive reactivity additions.

The current Required Actions to be taken when an SRM is inoperable were established by two travelers:

- TSTF-286-A, Revision 2, "Define 'Operations Involving Positive Reactivity Additions'," (Reference 1) revised Required Action A.2 from "Suspend positive reactivity additions," to "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1." Required Action A.1, "Suspend Core Alterations," was not affected.

  TSTF-286 revised Actions and Notes that required suspension of operations involving positive reactivity additions or precluded reduction in boron concentration by instead limiting positive reactivity additions to those within the TS-required Shutdown Margin.

- TSTF-471-A, Revision 1, "Eliminate use of term CORE ALTERATIONS in ACTIONS and Notes,"(Reference 2) replaced Required Action A.1, "Suspend CORE ALTERATIONS," with "Suspend positive reactivity additions."

  Following approval of TSTF-51, Revision 2, "Revise Containment Requirements during Handling Irradiated Fuel and Core Alterations," (Reference 3) the defined term Core Alterations appeared in the Required Actions and Surveillance Notes of less than ten Pressurized Water Reactor (PWR) specifications. Suspending Core Alterations or exempting testing except during Core Alterations had no effect on the initial conditions or mitigation of any Design Basis Accident (DBA) or transient, and the requirements applied an operational burden with no corresponding safety benefit. Therefore, TSTF-471 eliminated the defined term "Core Alterations," and removed the remaining references to Core Alterations from the PWR STS.

A letter from the NRC to the TSTF dated November 7, 2013, titled, "Potential Issues With Plant-Specific Adoption Of Travelers TSTF-51, Revision 2, 'Revise Containment Requirements During Handling Irradiated Fuel And Core Alterations,' TSTF-286, Revision 2, 'Operations Involving Positive Reactivity Additions,' and TSTF-471, Revision 1, 'Eliminate Use Of Term Core Alterations In Actions And Notes'," described NRC staff concerns with the subject travelers. These concerns were discussed in TSTF/NRC public meetings held on November 21, 2013 and January 9, 2014, and during a teleconference held on November 26, 2013.

During these discussions, the NRC staff clarified their concern with the Required Actions in the Nuclear Instrumentation specification when one SRM is inoperable. During movement of fuel assemblies, sources, and reactivity control components with one SRM inoperable, there is the potential for the operable SRM to become effectively decoupled from the core reactivity condition. For example, if one SRM is inoperable, and certain, strategically located fuel assemblies are removed, the operable SRM may no longer be capable of monitoring the reactivity condition of fuel assemblies that are located in the far half of the core. Therefore, the

changes made in TSTF-286 and TSTF-471 may create a situation in which an increase in neutron flux might go undetected.

### 4.1. Description of the Proposed Change

The proposed change revises the "Nuclear Instrumentation" Action for one inoperable source range neutron flux monitor. Deleted text is identified with ~~strikethrough~~ and inserted text is identified in *italics*.

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One [required] source range neutron flux monitor inoperable. | A.1 | Suspend positive reactivity additions. | Immediately |
| | AND | | |
| | A.2 | ---------- *NOTE* ----------<br>*Fuel assemblies, sources, and reactivity control components may be moved if necessary to restore an inoperable source range neutron flux monitor or to complete movement of a component to a safe condition.*<br>----------<br>*Suspend movement of fuel, sources, and reactivity control components within the reactor vessel.*<br>~~Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1~~. | Immediately |

The proposed change is supported by changes to the TS Bases. The regulation at Title 10 of the Code of Federal Regulations (10 CFR), Part 50.36, states, "A summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the technical specifications." A licensee may make changes to the TS Bases without prior NRC review and approval in accordance with the Technical Specifications Bases Control Program. The proposed TS Bases changes are

consistent with the proposed TS changes and provide the purpose for each requirement in the specification consistent with the Commission's Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, dated July 2, 1993 (58 FR 39132). Therefore, the Bases changes are provided for information and approval of the Bases is not requested.

A model application is attached. The model may be used by licensees desiring to adopt the traveler following NRC approval.

## 5. TECHNICAL EVALUATION

The proposed change revises the actions to be taken when an SRM is inoperable.

The existing Required Action A.1, which requires immediately suspending positive reactivity additions, is unchanged. This action prohibits diluting the boron concentration of the coolant in the RCS, the loading of fuel assemblies or sources into the core, or the removal of reactivity control components.

The existing Required Action A.2, which that prohibits introducing coolant into the RCS unless that coolant has a boron concentration greater than or equal to the boron concentration limit in LCO 3.9.1, is deleted. This action would allow dilution of the boron concentration in the RCS with one SRM inoperable provided the boron concentration is not reduced to less than the limit in LCO 3.9.1. Removal of this action addresses the NRC staff concern that an inadvertent boron dilution could occur and the change in core reactivity may not be detected due to the inoperable SRM. With the removal of Required Action A.2, Required Action A.1 would prohibit any dilution of the RCS, even if the introduced coolant has a boron concentration greater than the limit in LCO 3.9.1.

The proposed Required Action A.2 would also prohibit any movement of fuel, sources, or reactivity control components in the reactor core. With one SRM inoperable, the operator may not be able to monitor the core reactivity condition in part of the reactor. Therefore, the conservative action is to suspend movement of any core components that may affect reactivity until the SRM is restored. While unlikely, movement of fuel assemblies from one core location to another, the movement of sources, or the removal of reactivity control components, could result in an undetected change in core reactivity.

The proposed Required Action A.2 is modified by a Note that permits fuel assemblies, sources, and reactivity control components to be moved if necessary to restore an inoperable SRM or to complete movement of a component to a safe condition. The SRMs are located outside the reactor core, typically in wells in the concrete reactor shield. The radiation levels in these wells can be very high if fuel assemblies are nearby. Troubleshooting, repair, or replacement of the inoperable SRM may require moving fuel, sources, or reactivity control components away from the SRM location to minimize the radiation dose to the workers. If a fuel assembly, source, or reactivity control component is in the process of being moved when it is discovered that the SRM is inoperable, the component may be placed in a safe location.

## 6. REGULATORY EVALUATION

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

> The purpose of Technical Specifications is to impose those conditions or limitations upon reactor operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety by identifying those features that are of controlling importance to safety and establishing on them certain conditions of operation which cannot be changed without prior Commission approval.
>
> …[T]he Commission will also entertain requests to adopt portions of the improved STS, even if the licensee does not adopt all STS improvements.
>
> …The Commission encourages all licensees who submit Technical Specification related submittals based on this Policy Statement to emphasize human factors principles.
>
> …In accordance with this Policy Statement, improved STS have been developed and will be maintained for each NSSS Owners Group. . The Commission encourages licensees to use the improved STS as the basis for plant-specific Technical Specifications.
>
> …[I]t is the Commission intent that the wording and Bases of the improved STS be used … to the extent practicable.

As described in the Commission's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," recommendations were made by NRC and industry task groups for new STS that include greater emphasis on human factors principles in order to add clarity and understanding to the text of the STS, and provide improvements to the Bases of STS, which provides the purpose for each requirement in the specification. Improved vendor-specific STS were developed and issued by the NRC in September 1992.

The regulation at Title 10 of the Code of Federal Regulations (10 CFR) Section 50.36(a)(1) requires an applicant for an operating license to include in the application proposed TS in accordance with the requirements of 10 CFR 50.36. The applicant must include in the application a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls…." However, per 10 CFR 50.36(a)(1), these technical specification bases "shall not become part of the technical specifications." The Final Policy Statement provides the following description of the scope and the purpose of the Technical Specification Bases:

> Appropriate Surveillance Requirements and Actions should be retained for each LCO [limiting condition for operation] which remains or is included in the Technical Specifications. Each LCO, Action, and Surveillance Requirement should have supporting Bases. The Bases should at a minimum address the following questions and cite references to appropriate licensing documentation (e.g., FSAR, Topical Report) to support the Bases.

1. What is the justification for the Technical Specification, i.e., which Policy Statement criterion requires it to be in the Technical Specifications?

2. What are the Bases for each LCO, i.e., why was it determined to be the lowest functional capability or performance level for the system or component in question necessary for safe operation of the facility and, what are the reasons for the Applicability of the LCO?

3. What are the Bases for each Action, i.e., why should this remedial action be taken if the associated LCO cannot be met; how does this Action relate to other Actions associated with the LCO; and what justifies continued operation of the system or component at the reduced state from the state specified in the LCO for the allowed time period?

4. What are the Bases for each Safety Limit?

5. What are the Bases for each Surveillance Requirement and Surveillance Frequency; i.e., what specific functional requirement is the surveillance designed to verify? Why is this surveillance necessary at the specified frequency to assure that the system or component function is maintained, that facility operation will be within the Safety Limits, and that the LCO will be met?

   Note: In answering these questions the Bases for each number (e.g., Allowable Value, Response Time, Completion Time, Surveillance Frequency), state, condition, and definition (e.g., operability) should be clearly specified. As an example, a number might be based on engineering judgment, past experience, or PSA [probabilistic safety assessment] insights; but this should be clearly stated.

Additionally, 10 CFR 50.36(b) requires:

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

The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Per 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

Per 10 CFR 50.90, whenever a holder of a license desires to amend the license, application for an amendment must be filed with the Commission, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.

Per 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate.

The NRC staff's guidance for the review of TSs is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), dated March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared STS for each of the light-water reactor nuclear designs.

In conclusion, based on the considerations discussed above, the proposed revision does not alter the current manner of operation and (1) there is reasonable assurance that the health and safety of the public will not be endangered by continued operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

## 7. REFERENCES

1. TSTF-286, Revision 2, "Operations Involving Positive Reactivity Additions," approved July 6, 2000 (ADAMS Accession No. ML003730788).

2. TSTF-471, Revision 1, "Eliminate Use of Term Core Alterations in Actions and Notes," approved on December 7, 2006 (ADAMS Accession No. ML062860320).

3. TSTF-51, Revision 2, "Revise Containment Requirements during Handling Irradiated Fuel and Core Alterations," approved on November 1, 1999 (ADAMS Accession No. ML993190284).

# Model Application

[DATE] 10 CFR 50.90

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

DOCKET NO.PLANT NAME
50-[xxx]
SUBJECT: Application to Revise Technical Specifications to Adopt TSTF-571, "Revise Actions for Inoperable Source Range Neutron Flux Monitor"

Pursuant to 10 CFR 50.90, [LICENSEE] is submitting a request for an amendment to the Technical Specifications (TS) for [PLANT NAME, UNIT NOS.].

[LICENSEE] requests adoption of TSTF 571, "Revise Actions for Inoperable Source Range Neutron Flux Monitor." TSTF-571 revises the Required Actions for an inoperable source range neutron flux monitor (SRM) to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. A provision is included to allow such movement if it is needed to repair the SRM. The proposed changes ensure that no actions are taken that could alter the core reactivity with an inoperable SRM.

The enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked to show the proposed changes. Attachment 2 provides revised (clean) TS pages. Attachment 3 provides the existing TS Bases pages marked to show revised text associated with the proposed TS changes and is provided for information only.

Approval of the proposed amendment is requested by [date]. Once approved, the amendment shall be implemented within [ ] days.

There are no regulatory commitments made in this submittal.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated [STATE] Official.

[In accordance with 10 CFR 50.30(b), a license amendment request must be executed in a signed original under oath or affirmation. This can be accomplished by attaching a notarized affidavit confirming the signature authority of the signatory, or by including the following statement in the cover letter: "I declare under penalty of perjury that the foregoing is true and correct. Executed on (date)." The alternative statement is pursuant to 28 USC 1746. It does not require notarization.]

If you should have any questions regarding this submittal, please contact [NAME, TELEPHONE NUMBER].

Sincerely,

[Name, Title]

Enclosure: Description and Assessment

Attachments:
1. Proposed Technical Specification Changes (Mark-Up)
2. Revised Technical Specification Pages
3. Proposed Technical Specification Bases Changes (Mark-Up) – For Information Only

[The attachments are to be provided by the licensee and are not included in the model application.]

cc: NRC Project Manager
NRC Regional Office
NRC Resident Inspector
State Contact

ENCLOSURE

DESCRIPTION AND ASSESSMENT

## 1.0 DESCRIPTION

[LICENSEE] requests adoption of TSTF-571, "Revise Actions for Inoperable Source Range Neutron Flux Monitor." TSTF-571 revises the Required Actions for an inoperable source range neutron flux monitor (SRM) to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. A provision is included to allow such movement if it is needed to repair the SRM. The proposed changes ensure that no actions are taken that could alter the core reactivity when an SRM is inoperable.

## 2.0 ASSESSMENT

### 2.1 Applicability of Safety Evaluation

[LICENSEE] has reviewed the safety evaluation for TSTF-571 provided to the Technical Specifications Task Force in a letter dated [DATE]. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-571. [As described herein,] [LICENSEE] has concluded that the justifications presented in TSTF-571 and the safety evaluation prepared by the NRC staff are applicable to [PLANT, UNIT NOS.] and justify this amendment for the incorporation of the changes to the [PLANT] TS.

### 2.2 Optional Changes and Variations

[LICENSEE is not proposing any variations from the TS changes described in the TSTF-571 or the applicable parts of the NRC staff's safety evaluation dated [DATE].] [LICENSEE is proposing the following variations from the TS changes described in the TSTF-571 or the applicable parts of the NRC staff's safety evaluation: describe the variations]

[The [PLANT] TS utilize different [numbering][and][titles] than the Standard Technical Specifications on which TSTF-571 was based. Specifically, [describe differences between the plant-specific TS numbering and/or titles and the TSTF-571 numbering and titles.] These differences are administrative and do not affect the applicability of TSTF-571 to the [PLANT] TS.]

[The [PLANT] TS contain requirements that differ from the Standard Technical Specifications on which TSTF-571 was based but are encompassed in the TSTF-571 justification. [Describe differences and why TSTF-571 is still applicable.]]

## 3.0 REGULATORY ANALYSIS

### 3.1 No Significant Hazards Consideration Analysis

[LICENSEE] requests adoption of TSTF-571, "Revise Actions for Inoperable Source Range Neutron Flux Monitor." TSTF-571 revises the Required Actions for an inoperable source range neutron flux monitor (SRM) to prohibit the movement of fuel assemblies, sources, and reactivity

control components when an SRM is inoperable. A provision is included to allow such movement if it is needed to repair the SRM. The proposed changes ensure that no actions are taken that could alter the core reactivity when an SRM is inoperable.

[LICENSEE] has evaluated if a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change revises the Required Actions for an inoperable SRM to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. The Actions taken when an SRM is inoperable are not initiators to any accident previously evaluated. [The SRMs are not credited to mitigate any previously evaluated accident.][The SRMs are credited to detecting a boron dilution accident. The proposed change restricts the licensee's actions while an SRM is inoperable beyond the current requirements, further preventing the occurrence of a boron dilution accident.] Therefore, the consequences of an accident previously evaluated are not significantly increased.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The proposed change revises the Required Actions for an inoperable SRM to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed). No credible new failure mechanisms, malfunctions, or accident initiators that would have been considered a design basis accident in the UFSAR are created.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No

   The proposed change revises the Required Actions for an inoperable SRM to prohibit the movement of fuel assemblies, sources, and reactivity control components when an SRM is inoperable. No safety limits are affected. No Limiting Conditions for Operation or

Surveillance limits are affected. The design, operation, surveillance methods, and acceptance criteria specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plants' licensing basis. The proposed change does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. As such, there are no changes being made to safety analysis assumptions, safety limits, or limiting safety system settings that would adversely affect plant safety.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, [LICENSEE] concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 3.2 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 4.0 ENVIRONMENTAL EVALUATION

The proposed change does not change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or does not change an inspection or surveillance requirement. The proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

**Technical Specifications and Bases Changes**

## 3.9 REFUELING OPERATIONS

### 3.9.2 Nuclear Instrumentation

LCO 3.9.2 Two source range neutron flux monitors shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One [required] source range neutron flux monitor inoperable. | A.1 Suspend positive reactivity additions. | Immediately |
| | AND | |
| | A.2 ---------- NOTE ---------- Fuel assemblies, sources, and reactivity control components may be moved if necessary to restore an inoperable source range neutron flux monitor or to complete movement of a component to a safe condition. ---------- Suspend movement of fuel, sources, and reactivity control components within the reactor vessel.~~Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.~~ | Immediately |
| B. Two [required] source range neutron flux monitors inoperable. | B.1 Initiate action to restore one source range neutron flux monitor to OPERABLE status. | Immediately |

BASES

ACTIONS

A.1 and A.2

With only one [required] source range neutron flux monitor OPERABLE, redundancy has been lost. Since these instruments are the only direct means of monitoring core reactivity conditions, positive reactivity additions and movement of fuel, sources, and reactivity control components within the reactor vessel ~~introduction of coolant into the RCS with boron concentration less than required to meet the minimum boron concentration of LCO 3.9.1~~ must be suspended immediately. ~~Suspending positive reactivity additions that could result in failure to meet the minimum boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation.~~ Performance of Required Action A.1 shall not preclude completion of movement of a component to a safe position. Suspending the movement of fuel, sources, and reactivity control components ensures that positive reactivity is not inadvertently added to the reactor core while the source range neutron flux monitor is inoperable. Required Action A.2 is modified by a Note that states that fuel assemblies, sources, and reactivity control components may be moved if necessary to facilitate repair or replacement of the inoperable source range neutron flux monitor. It may be necessary to move these items away from the locations in the core close to the source range neutron flux monitor to minimize personnel radiation dose during troubleshooting or repair. The Note also permits completion of movement of a component to a safe position, should the source range neutron flux monitor be discovered inoperable during component movement.

B.1

With no [required] source range neutron flux monitor OPERABLE, action to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, action shall be continued until a source range neutron flux monitor is restored to OPERABLE status.

B.2

With no [required] source range neutron flux monitor OPERABLE, there is no direct means of detecting changes in core reactivity. However, since positive reactivity additions are not to be made, the core reactivity condition is stabilized until the source range neutron flux monitors are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

## 3.9 REFUELING OPERATIONS

### 3.9.3 Nuclear Instrumentation

LCO 3.9.3 Two source range neutron flux monitors shall be OPERABLE.

AND

[ One source range audible [alarm] [count rate] circuit shall be OPERABLE. ]

APPLICABILITY: MODE 6.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One [required] source range neutron flux monitor inoperable. | A.1 Suspend positive reactivity additions. | Immediately |
| | AND | |
| | A.2 ---------- NOTE ---------- Fuel assemblies, sources, and reactivity control components may be moved if necessary to restore an inoperable source range neutron flux monitor or to complete movement of a component to a safe condition. ---------- Suspend movement of fuel, sources, and reactivity control components within the reactor vessel. ~~Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.~~ | Immediately |
| | | |

BASES

APPLICABLE SAFETY ANALYSES (continued)

----------REVIEWER'S NOTE----------
The need for a safety analysis for an uncontrolled boron dilution accident is eliminated by isolating all unborated water sources as required by LCO 3.9.2, "Unborated Water Source Isolation Valves."
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The source range neutron flux monitors satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that two source range neutron flux monitors be OPERABLE to ensure that redundant monitoring capability is available to detect changes in core reactivity. To be OPERABLE, each monitor must provide visual indication [in the control room]. [In addition, at least one of the two monitors must provide an OPERABLE audible [alarm] [count rate] function to alert the operators to the initiation of a boron dilution event.]

APPLICABILITY

In MODE 6, the source range neutron flux monitors must be OPERABLE to determine changes in core reactivity. There are no other direct means available to check core reactivity levels. In MODES 2, 3, 4, and 5, these same installed source range detectors and circuitry are also required to be OPERABLE by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation [and LCO 3.3.9, "BDPS"].

ACTIONS

A.1 and A.2

With only one source range neutron flux monitor OPERABLE, redundancy has been lost. Since these instruments are the only direct means of monitoring core reactivity conditions, positive reactivity additions and movement of fuel, sources, and reactivity control components within the reactor vessel ~~introduction of coolant into the RCS with boron concentration less than required to meet the minimum boron concentration of LCO 3.9.1~~ must be suspended immediately. ~~Suspending positive reactivity additions that could result in failure to meet the minimum boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation.~~ Performance of Required Action A.1 shall not preclude completion of movement of a component to a safe position. Suspending the movement of fuel, sources, and reactivity control components ensures that positive reactivity is not inadvertently added to the reactor core while the source range neutron flux monitor is inoperable. Required Action A.2 is modified by a Note that states that fuel assemblies, sources, and reactivity control components may be moved if necessary to facilitate repair or replacement of the inoperable

source range neutron flux monitor. It may be necessary to move these items away from the locations in the core close to the source range neutron flux monitor to minimize personnel radiation dose during troubleshooting or repair. The Note also permits completion of movement of a component to a safe position, should the source range neutron flux monitor be discovered inoperable during component movement.

## 3.9 REFUELING OPERATIONS

### 3.9.2 Nuclear Instrumentation

LCO 3.9.2 Two source range monitors (SRMs) shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One [required] SRM inoperable. | A.1 Suspend positive reactivity additions. | Immediately |
| | AND | |
| | A.2 ---------- NOTE ---------- Fuel assemblies, sources, and reactivity control components may be moved if necessary to restore an inoperable source range neutron flux monitor or to complete movement of a component to a safe condition. ---------- Suspend movement of fuel, sources, and reactivity control components within the reactor vessel. ~~Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.~~ | Immediately |
| B. Two [required] SRMs inoperable. | B.1 Initiate action to restore one SRM to OPERABLE status. | Immediately |
| | AND | |

BASES

ACTIONS

A.1 and A.2

With only one SRM OPERABLE, redundancy has been lost. Since these instruments are the only direct means of monitoring core reactivity conditions, positive reactivity additions and movement of fuel, sources, and reactivity control components within the reactor vessel ~~introduction of coolant into the RCS with boron concentration less than required to meet the minimum boron concentration of LCO 3.9.1~~ must be suspended immediately. ~~Suspending positive reactivity additions that could result in failure to meet the minimum boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation.~~ Performance of Required Action A.1 shall not preclude completion of movement of a component to a safe position. Suspending the movement of fuel, sources, and reactivity control components ensures that positive reactivity is not inadvertently added to the reactor core while the SRM is inoperable. Required Action A.2 is modified by a Note that states that fuel assemblies, sources, and reactivity control components may be moved if necessary to facilitate repair or replacement of the inoperable SRM. It may be necessary to move these items away from the locations in the core close to the SRM to minimize personnel radiation dose during troubleshooting or repair. The Note also permits completion of movement of a component to a safe position, should the SRM be discovered inoperable during component movement.

B.1

With no SRM OPERABLE, action to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, action shall be continued until an SRM is restored to OPERABLE status.

B.2

With no SRM OPERABLE, there is no direct means of detecting changes in core reactivity. However, since positive reactivity additions are not to be made, the core reactivity condition is stabilized until the SRMs are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to verify that the required boron concentration exists.

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The

## 3.9 REFUELING OPERATIONS

### 3.9.3 Nuclear Instrumentation

LCO 3.9.3 Two source range neutron flux monitors shall be OPERABLE.

APPLICABILITY: MODE 6

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One required source range neutron flux monitor inoperable. | A.1 Suspend positive reactivity additions. | Immediately |
| | AND | |
| | A.2 ---------- NOTE ---------- Fuel assemblies, sources, and reactivity control components may be moved if necessary to restore an inoperable source range neutron flux monitor or to complete movement of a component to a safe condition. ---------- Suspend movement of fuel, sources, and reactivity control components within the reactor vessel.~~Suspend operations that would cause introduction into the Reactor Coolant System (RCS), coolant with boron concentration less than required to meet the boron concentration of LCO 3.9.1.~~ | Immediately |

BASES

APPLICABILITY (continued)

LCO 3.3.8, “Engineered Safety Feature Actuation System (ESFAS) Instrumentation,” Function 17, “Source Range Neutron Flux Doubling.”

ACTIONS

A.1 and A.2

Redundancy has been lost if only one source range neutron flux monitor is OPERABLE. Since these instruments are the only direct means of monitoring core reactivity conditions, positive reactivity additions and movement of fuel, sources, and reactivity control components within the reactor vessel ~~introduction of coolant into the RCS with boron concentration less than required to meet the minimum boron concentration of LCO 3.9.1~~ must be suspended immediately. ~~Suspending positive reactivity additions that could result in failure to meet the minimum boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that which would be required in the RCS for minimum refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation.~~ Performance of Required Action A.1 shall not preclude completion of actions to establish a safe condition. Suspending the movement of fuel, sources, and reactivity control components ensures that positive reactivity is not inadvertently added to the reactor core while the source range neutron flux monitor is inoperable. Required Action A.2 is modified by a Note that states that fuel assemblies, sources, and reactivity control components may be moved if necessary to facilitate repair or replacement of the inoperable source range neutron flux monitor. It may be necessary to move these items away from the locations in the core close to the source range neutron flux monitor to minimize personnel radiation dose during troubleshooting or repair. The Note also permits completion of movement of a component to a safe position, should the source range neutron flux monitor be discovered inoperable during component movement.

B.1

If no source range neutron flux monitors are OPERABLE, actions to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, actions shall be continued until a source range neutron flux monitor is restored to OPERABLE status.

B.2