

December 7, 2006

Technical Specification Task Force (TSTF)  
11921 Rockville Pike  
Suite 100  
Rockville, MD 20852

Dear Members of the TSTF:

By letter dated June 7, 2005, the Technical Specifications Task Force submitted Technical Specification Task Force Change Traveler, TSTF-471, R.1, "Eliminate Use of Term Core Alterations in ACTIONS and Notes." The Nuclear Regulatory Commission has completed the review of TSTF-471 and approved the proposed change. The staff's Safety Evaluation Report for TSTF-471 is enclosed. TSTF-471 was reviewed concurrent with the Calvert Cliffs license amendment request to eliminate the use of term core alterations in ACTIONS and Notes. T-Travelers typically involve administrative revisions, such as clarifications to the STS that do not warrant the detailed technical review involved with the Consolidated Line Item Improvement Process.

Please contact me at (301) 415-1932 or e-mail [TJK1@nrc.gov](mailto:TJK1@nrc.gov) if you have any questions or need further information on these proposed changes.

Sincerely,

*/RA/*

Timothy J. Kobetz, Chief  
Technical Specifications Branch  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

Enclosures:  
As stated

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# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

## TECHNICAL SPECIFICATION TASK FORCE-471, REV. 1

### “ELIMINATE USE OF TERM CORE ALTERATIONS IN ACTIONS AND NOTES”

#### 1.0 INTRODUCTION

By letter dated June 7, 2005, the Technical Specifications Task Force (TSTF) submitted Technical Specification Task Force Change Traveler, TSTF-471, R.1, “Eliminate Use of Term Core Alterations in ACTIONS and Notes.” Specifically, the proposed revisions to the Standard Technical Specifications (STS) eliminate the use of term Core Alterations from NUREG-1430, “Standard Technical Specifications, Revision 3 Babcock and Wilcox Plants,” dated March 2004; NUREG-1431, “Standard Technical Specifications, Revision 3 Westinghouse Plants,” dated March 2004; and NUREG-1432, “Standard Technical Specifications, Revision 3 Combustion Engineering Plants,” dated March 2004.

#### 2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act (the “Act”) requires applicants for nuclear power plant operating licenses to include technical specifications (TS) as part of the license. The TS ensure the operational capability of structures, systems and components that are required to protect the health and safety of the public. The Commission’s regulatory requirements related to the content of the TS are contained in 10 CFR Section 50.36. The regulation requires that the TS include items in the following specific categories: (1) safety limits, limiting safety systems settings, and limiting control settings (50.36(c)(1)); (2) Limiting Conditions for Operation (50.36(c)(2)); (3) Surveillance Requirements (50.36(c)(3)); (4) design features (50.34(c)(4)); and (5) administrative controls (50.36(c)(5)).

In general, there are two classes of changes to TS: (1) changes needed to reflect modifications to the design basis (TS are derived from the design basis), and (2) voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of TS over time. This amendment deals with the second class of changes.

In determining the acceptability of revising STS the staff used the accumulation of generically approved guidance in NUREG-1430, NUREG-1431 and NUREG-1432.

Licensees may revise the TS to adopt current improved STS format and content provided that plant-specific review supports a finding of continued adequate safety because: (1) the change is editorial, administrative or provides clarification (i.e., no requirements are materially altered), (2) the change is more restrictive than the licensee’s current requirement, or (3) the change is less restrictive than the licensee’s current requirement, but nonetheless still affords adequate assurance of safety when judged against current regulatory standards. The detailed application of this general framework, and additional specialized guidance, are discussed in Section 3.0 in the context of specific proposed changes.

### 3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the justification for the proposed TSTF traveler as described in the June 7, 2005 submittal. The detailed evaluation below will support the conclusion that: (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.

#### 3.1 Core Alterations

In STS 1.1, "Definitions," the term "Core Alteration" is defined as "Core Alteration shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of Core Alterations shall not preclude completion of movement of a component to a safe position."

TSTF-471 proposes to delete the term Core Alteration from the following STS Sections:

#### NUREG-1430, 1431, and 1432

Section 3.8.2, "AC Sources-Shutdown"  
Section 3.8.5, "DC Sources-Shutdown"  
Section 3.8.8, "Inverters-Shutdown"  
Section 3.8.10, "Distribution Systems-Shutdown"  
Section 3.9.1, "Boron Concentration"  
Section 3.9.2 or 3.9.3, "Nuclear Instrumentation"

#### NUREG-1431

Section 3.9.2, "Unborated Water Source Isolation Valves"

#### NUREG-1432

Section 3.3.8.4, "CPIS (Digital)"

As stated in TSTF-471, the deletion of the required Action to suspend Core Alterations has no effect on the initial conditions or mitigation of any design-basis accident (DBA) or transient. The TSTF-471 STS changes are voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of STS over time.

When the reactor vessel head is removed, Core Alterations take place during Mode 6 operation. There are only two accidents considered during Mode 6. These are: (1) a fuel handling accident (FHA), and (2) a boron dilution accident. The analysis of the FHA assumes that a fuel assembly is dropped during fuel handling in the containment or the spent fuel pool. Interlocks and procedural and administrative controls make such an event highly unlikely. However, if an assembly were damaged to the extent that one or more fuel rods were broken, the accumulated fission product gases and iodines in the fuel element gap would be released to the surrounding water. Release of the solid fission products in the fuel would be negligible because of the low fuel temperature during refueling, which greatly limits diffusion. There are

no mitigation for the FHA actions, except for taking credit for ventilation systems to reduce the dose consequences. The suspension of core alterations, except for suspension of movement of irradiated fuel, will not prevent or impair the mitigation of a FHA.

A boron dilution accident is initiated by a dilution source that results in the boron concentration dropping below what is required to maintain the shutdown margin. STS 3.9.1, "Boron Concentration" applies in Mode 6 and the refueling boron concentration limit is specified in the Core Operating Limits Report (COLR). This accident is mitigated by stopping the dilution and suspension of core alterations has no effect on the mitigation of a boron dilution accident. Also the control rods or fuel do not affect the initial conditions of a boron dilution accident. Based on the NRC staff review, removing the requirements to suspend core alterations does not affect the two accidents considered during Mode 6 operations. As such, removing the requirement to "Suspend Core Alterations" from the STS related to operation in Mode 6 is acceptable to the NRC staff.

### 3.2 Changes to the STS

#### STS 1.1 - Definition of Core Alteration

This STS is the definition of Core Alterations. TSTF-471 proposes to remove this definition.

STS 1.1 does not have any actions or surveillance requirements. Removing this definition is consistent with the other changes. Since the term is no longer used in the LCOs or the SRs, the NRC staff finds it acceptable to remove the definition of Core Alterations from STS 1.1.

#### STS 3.9.1 - Boron Concentration

This STS requires that Core Alterations be suspended if the required boron concentration is not maintained within the limit specified in the COLR.

The boron concentration limit during refueling operations assures that the reactor remains subcritical during Mode 6. The term Core Alteration is not included in the Applicability statement for this STS. However, if core alterations are being performed during Mode 6, they must be suspended if the required boron concentration is not maintained. Also, the STS Required Actions still require suspending positive reactivity additions if boron concentration is not within limit. Since the Required Action to suspend positive reactivity additions provides the assurance that the reactor remains subcritical, the NRC staff finds the proposed removal of the action to suspend core alterations acceptable.

#### STS 3.9.2 - Nuclear Instrumentation

This STS requires that Core Alterations be suspended if the required nuclear instrumentation is determined to be inoperable. The TSTF-471 proposes to delete "Core Alterations" from this STS and revise this STS Action A.1. The revised Action will state in the STS, "Suspend Positive Reactivity Additions" when required nuclear instrumentation is inoperable.

Two source range monitors (SRMs) are used during refueling operations to monitor the core reactivity condition. The installed SRMs are part of the nuclear instrumentation system. These detectors are located external to the reactor vessel and detect neutrons leaking from the core.

Since these instruments are the only direct means of monitoring core reactivity conditions, if the SRMs are inoperable, positive reactivity additions must be suspended immediately to preclude an accidental criticality. These requirements provide reasonable assurance that an accidental criticality will be avoided and is acceptable to the NRC staff.

TSTF-471 proposes to replace the Required Action to “Suspend Core Alterations” from this STS with the Action to “Suspend Positive Reactivity Additions,” when required SRM instrumentation is inoperable. Since the requirement provides reasonable assurance that an accidental criticality will be avoided, the NRC staff finds the change acceptable.

#### STS 3.9.4 - Shutdown Cooling and Coolant Circulation - High Water Level

This STS LCO requires that one shutdown cooling loop shall be OPERABLE and in operation in Mode 6. TSTF-471 proposes to revise Note 2b, which states “Core Alterations are suspended,” with “Movement of fuel assemblies within containment is suspended.”

The Note wording, “Core Alterations are suspended” is used as a restriction in the LCO that allows removal of the shutdown cooling pumps from operation for a period of time. This is a Note, based on plant design, to allow work to be performed on a common system during Mode 6. The Note has no effect on initial conditions or mitigation of any design basis accident or transient. The revised Note, “Movement of fuel assemblies within containment is suspended,” provides reasonable assurance that an accidental criticality will be avoided and is acceptable to the NRC staff.

#### STS 3.9.6 - Refueling Pool Water Level

When refueling pool water level is not within limits, the STS Action A.1 requires core alterations to be suspended during refueling operations. This LCO requires that the refueling pool water level requirement must be met before performing any core alterations.

This imposes an administrative burden on the operators, who have to verify that the water level meets the LCO requirement when core alterations, other than movement of irradiated fuel, are performed. The refueling pool water level is credited in the safety analysis for a fuel handling accident while moving irradiated fuel assemblies. It is not credited for other core alterations. The administrative burden of tracking water levels and responding to a change in the water level during core alterations excluding the movement of irradiated fuel has no benefit in the safety analyses and other controls are in place for safe operation. Therefore, the STS Action A.1, “Suspend Core Alterations” will be eliminated from this STS. The NRC staff finds the proposed STS change acceptable since movement of irradiated fuel continues to be restricted when the refueling pool water level LCO is not met.

## 4.0 CONCLUSION

The NRC staff has reviewed the proposed TSTF-471 changes and finds that the elimination of the term Core Alterations from the STS facilitates the refueling operations during Mode 6. Since the requirements to suspend the movement of irradiated fuel assemblies within the containment remains, removing the STS Action item, “Suspend Core Alterations,” has no effect

on the initial conditions or mitigation of any design accident or transient and therefore is acceptable. The NRC staff has concluded, based on the conclusion above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in this manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.