

April 14, 2006

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

SUBJECT: DRAFT SAFETY EVALUATION (SE) FOR REVIEW AND COMMENT AND A
REQUEST FOR ADDITIONAL INFORMATION REGARDING TSTF-412,
REVISION 2, "PROVIDE ACTIONS FOR ONE STEAM SUPPLY TO TURBINE
DRIVEN AFW/EFW PUMP INOPERABLE"

Dear Members of the TSTF,

By letter dated January 31, 2006, the Westinghouse Owners Group submitted TSTF-412, Revision 2, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable". In response, the Nuclear Regulatory Commission (NRC) staff has prepared a Draft SE for industry review and comments (Enclosure 1). In addition, the NRC staff has been reviewing the TSTF submittal and has determined that additional information is needed to complete its review. NRC staff questions are found in the enclosed Request for Additional Information (RAI) (Enclosure 2). A response containing comments on the Draft SE and answers to the RAI is requested within 30 days.

Sincerely,

/RA/

Thomas H. Boyce, Chief
Technical Specifications Branch
Division of Inspections & Regional Support
Office of Nuclear Reactor Regulation

Enclosures: As stated

cc: P. Infanger, BWOG
M. Crothers, BWROG
B. Woods, WOG/CE
W. Sparkman, WOG
D. Hoffman, EXCEL
B. Mann, EXCEL
J. Riley, NEI

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ENCLOSURE 1: DRAFT SAFETY EVALUATION

REGARDING TSTF-412, REVISION 2, "PROVIDE ACTIONS FOR ONE STEAM SUPPLY TO
TURBINE DRIVEN AFW/EFW PUMP INOPERABLE"

TECHNICAL SPECIFICATIONS TASK FORCE (TSTF)

By letter dated January 31, 2006, the Westinghouse Owners Group (WOG) submitted TSTF-412, Revision 2, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable". The Nuclear Regulatory Commission (NRC) staff herein provides a draft copy of a proposed Safety Evaluation for industry review and comment.

Proposed Model Plant Specific Safety Evaluation for

Technical Specification Task Force (TSTF) Change TSTF-412

"Provide Actions for One Steam Supply to the Turbine Driven AFW/EFW Pump Inoperable"

U.S. NUCLEAR REGULATORY COMMISSION

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. [_____] TO FACILITY OPERATING LICENSE NFP-[_____]

[UTILITY NAME]

[PLANT NAME], [UNIT _____]

DOCKET NO. -[_____]

1.0 INTRODUCTION

NUREGs 1430, 1431, and 1432 are the Standard Technical Specifications (STS) for the pressurized water reactors (PWRs) designed by Babcock and Wilcox (B&W), Westinghouse, and Combustion Engineering (CE) plants, respectively. STS 3.7.5 in each of these NUREGs provides the requirements for the emergency feedwater (EFW) system for B&W plants, and for the auxiliary feedwater (AFW) system for Westinghouse and CE plants. On January 31, 2006, the staff received a proposed change to STS 3.7.5 applicable to PWRs from the Technical Specification Task Force (TSTF): TSTF-412, Revision 2, "Provide Actions for One Steam Supply to the Turbine Driven AFW/EFW Pump Inoperable." The main purpose of the TSTF request is to establish a Completion Time in the STS for the Condition where one steam supply to the turbine driven AFW/EFW pump is inoperable concurrent with an inoperable motor driven AFW/EFW train. TSTF-412 also proposed to establish specific Conditions and Action requirements for when two motor driven AFW/EFW trains are inoperable at the same time that the turbine driven AFW/EFW train is inoperable either (a) due solely to one inoperable steam

Enclosure (1)

supply, or (b) due to reasons other than one inoperable steam supply. Minor editorial changes and clarifications were also proposed. Changes to the STS Bases were provided for informational purposes.

2.0 REGULATORY EVALUATION

In 10 CFR 50.36, the Commission established its regulatory requirements related to the content of Technical Specifications (TS). Pursuant to 10 CFR 50.36(c), TS are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) Limiting Conditions for Operation (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. The rule does not specify the particular requirements to be included in a plant's TS.

The TS are reflective of policies and practices that the NRC considers to be acceptable with respect to Technical Specifications Limiting Conditions for Operation, Completion Times, and Action requirements. Acceptance of the proposed changes to the STS will be judged based upon consistency with the existing policies and practices that have been established, along with consistency with any precedents that have been approved that are considered to be applicable.

3.0 TECHNICAL EVALUATION

TSTF-412 proposes to make changes to STS 3.7.5, "Emergency Feedwater (EFW) System" (for NUREG-1430), and to STS 3.7.5, "Auxiliary Feedwater (AFW) System" (for NUREG-1431 and NUREG-1432). This evaluation focuses on the technical merits of the proposed changes to the STS, and the actual wording that is used in the STS for the proposed changes is not included within the scope of this evaluation per se.

A description of each proposed change, along with the staff's evaluation, follows.

STS 3.7.5, Auxiliary Feedwater (AFW) / Emergency Feedwater (EFW) System

The AFW/EFW System is designed to automatically supply sufficient water to the steam generator(s) to remove decay heat upon the loss of normal feedwater supply with steam generator pressure at the setpoint of the Main Steam Safety Valves (MSSVs). Subsequently, the AFW/EFW System supplies sufficient water to cool the unit to Residual Heat Removal (RHR) System entry conditions, with steam being released through the Atmospheric Dump Valves (ADVs).

AFW/EFW Systems typically consist of two motor driven AFW/EFW pumps and one steam turbine driven pump configured into three trains. The capacity of the motor driven and steam driven AFW/EFW pumps can vary by plant. Motor driven pumps typically provide 50% or 100% of the required AFW/EFW flow capacity as assumed in the accident analysis. Motor driven AFW/EFW pumps are typically powered from an independent Class 1E power supply and each pump train typically feeds half of the steam generators, although each pump has the capability to be realigned from the control room to feed other steam generators. The steam turbine driven AFW/EFW pump provides either 100% or 200% of the required capacity to all steam generators. The steam turbine driven pump receives steam from two main steam lines

upstream of the main steam isolation valves. Each of the steam feed lines will supply 100% of the requirements of the turbine driven AFW/EFW pump.

LCO 3.7.5 Condition A (as proposed)

Condition A is modified to refer to the inoperability of a turbine driven AFW/EFW train due to an inoperable steam supply, instead of referring to the inoperability of a turbine driven AFW/EFW pump. This change is being proposed in order to make Condition A train oriented instead of component oriented, consistent with the other Conditions that are included in STS 3.7.5. The train oriented approach is consistent with the preferred approach that is generally reflected in the STS, and therefore the proposed change is considered to be acceptable.

STS 3.7.5, Condition C (as proposed)

A new Condition C with two possible Required Actions (C.1 OR C.2) is proposed for the turbine driven AFW/EFW train being inoperable due to one inoperable steam supply and one motor driven AFW/EFW train being inoperable at the same time. Required Action C.1 requires restoration of the affected steam supply to operable status within either 24 or 48 hours, depending on the capability of the motor driven AFW/EFW train that remains operable. Alternatively, Required Action C.2 requires restoration of the inoperable motor driven AFW/EFW train within either 24 or 48 hours, again depending on the capability of the motor driven AFW/EFW train that remains operable. New Condition C provides two proposed Completion Times that are dependent upon the capacity of the remaining operable motor driven AFW/EFW train to provide AFW/EFW to the steam generators.

A proposed 24 hour Completion Time is applicable to plants that may provide insufficient flow to the steam generators (SGs) in accordance with accident analyses assumptions if a main steam line break (MSLB) or feedwater line break (FLB) were to occur that renders the remaining steam supply to the turbine driven AFW/EFW pump inoperable (a concurrent single failure is not assumed). Insufficient feedwater flow could result, for example, if a single motor driven AFW/EFW train does not have sufficient capacity to satisfy accident analyses assumptions, or if the operable pump is feeding the faulted SG (i.e. the SG that is aligned to the operable steam supply for the turbine driven AFW/EFW pump). Likewise, a proposed 48 hour Completion Time is applicable when the remaining operable motor driven AFW/EFW train is capable of providing sufficient feedwater flow in accordance with accident analyses assumptions.

The STS typically allows a 72 hour Completion Time for Conditions where the remaining operable equipment is able to mitigate postulated accidents without assuming a concurrent single active failure. In this particular case, a 24 hour Completion Time is proposed for the situation where the AFW/EFW system would be able to perform its function for most postulated events, and would only be challenged by a MSLB or FLB that renders the remaining operable steam supply to the turbine driven AFW/EFW pump inoperable. Additionally, depending on the capacity of the operable motor driven AFW/EFW pump, it may be able to mitigate MSLB and FLB accidents during those instances when it is not aligned to the faulted SG. The selection of 24 hours for the Completion Time is based on the remaining operable steam supply to the turbine driven AFW/EFW pump and the continued functionality of the turbine driven AFW/EFW train, the remaining operable motor driven AFW/EFW train, and the low likelihood of an event occurring during this 24 hour period that would challenge the capability of the AFW/EFW system to provide feedwater to the SGs. The proposed Completion Time for this particular situation is consistent with what was approved for Waterford 3 by License Amendment 173 for

a similar Condition, and it is commensurate with the STS in that the proposed Completion Time is much less than the 72 hours that is allowed for the situation where accident mitigation capability is maintained. Therefore, the staff agrees that the proposed 24 hour Completion Time is acceptable for this particular situation.

A 48 hour Completion Time is proposed for the situation where the remaining operable motor driven AFW/EFW train is able to mitigate postulated accidents in accordance with accident analyses assumptions without assuming a concurrent single active failure. The selection of 48 hours is based on the continued capability of the AFW/EFW system to perform its function, while at the same time recognizing that this Condition represents a higher level of degradation than one inoperable AFW/EFW train which is currently allowed for up to 72 hours by STS 3.7.5. The proposed 48 hour Completion Time represents an appropriate balance between the more severe 24 hour situation discussed in the previous paragraph and the less severe Condition that is afforded a 72 hour Completion Time by the current STS. Therefore, the staff agrees that the proposed 48 hour Completion Time is acceptable for this particular situation.

STS 3.7.5, Condition D (as proposed)

The current Condition C is renamed as Condition D. This Condition has been modified to incorporate changes brought on by the addition of new Condition C. The first Condition has been modified and now applies to the situation where the Required Action and associated Completion Time of Condition A, B, or C are not met. This section of Condition D is modified to also apply to the new Condition C when the Completion Time that is specified for new Condition C is not met. The staff considers this to be appropriate and consistent with existing STS 3.7.5 requirements to place the plant in a mode where the Condition does not apply when the Required Actions are not met.

The second Condition following the first "OR" in Condition D is modified from "Two AFW/EFW trains inoperable in MODE 1, 2, or 3" to "Two AFW/EFW trains inoperable in MODE 1, 2, or 3 for reasons other than Condition C." This change is necessary to recognize the situation specified by Condition C (as proposed) where one motor driven AFW/EFW train is allowed to be inoperable at the same time that the turbine driven AFW/EFW train is inoperable due to an inoperable steam supply to the pump turbine. Therefore, the staff considers the proposed change to be acceptable.

A second "OR" is added to Condition D that adds a note that states: "This Condition is only applicable when the turbine driven AFW/EFW train is inoperable solely due to one inoperable steam supply." The note applies to a new addition to this Condition: "Three AFW/EFW trains inoperable." In the case of an inoperable turbine driven AFW/EFW train due to one steam supply being inoperable and two inoperable motor driven AFW/EFW trains, the turbine driven AFW/EFW train still provides a safety related means of conducting a plant cooldown. When in this situation, Condition D will still require the plant to be in Mode 3 in 6 hours and in Mode 4 in 18 hours. If the SG with the remaining operable steam supply for the turbine driven AFW/EFW pump is faulted, the plant will be left with no AFW/EFW capability. Consequently, while the one remaining steam supply for the turbine driven AFW/EFW train remains operable, the plant should be placed in a condition which minimizes the potential for a faulted SG and makes available alternative safety related means of removing reactor decay heat. The proposed Condition applies to a seriously degraded AFW/EFW system that warrants timely action to place the plant in Mode 4 where the Residual Heat Removal System can be used for decay

heat removal. Therefore, the staff agrees that the Required Action specified by Condition D to place the plant in Mode 4 is appropriate and necessary for the new Condition that is specified.

The Required Actions associated with this Condition were renamed from C.1 AND C.2 to D.1 AND D.2 but not otherwise changed. Required Action D.1 requires the plant to be in Mode 3 in 6 hours, and Required Action D.2 requires the plant to be in Mode 4 in 18 hours. This change is purely editorial as no other changes are involved. Therefore, this proposed change is acceptable.

STS 3.7.5, Condition E (as proposed)

The current Condition D provides a Required Action to immediately initiate action to restore one AFW/EFW train to operable status when three AFW/EFW trains are inoperable in Modes 1, 2, or 3. While in this Condition, all Required Actions that require mode changes are suspended until at least one AFW/EFW train is restored to operable status. Condition D is renamed as Condition E by the proposed change and the following note is added: "This Condition is only applicable when the turbine driven AFW/EFW pump train is inoperable for reasons other than one inoperable steam supply." This change is necessary to recognize the situation specified by the new Condition that is added to Condition D (as proposed) where both motor driven AFW/EFW trains are inoperable and the turbine driven AFW/EFW train is inoperable because one of the steam supplies for the pump turbine is inoperable. Therefore, the staff considers the proposed change to be acceptable.

STS 3.7.5, Condition F (as proposed)

Because current Condition D is renamed as Condition E, current Condition E is renamed as Condition F. This change is purely editorial as no other changes are involved. Therefore, the proposed change is acceptable.

STS 3.7.5 Bases (as proposed)

Though changes to the STS Bases do not require NRC approval per se, changes to the STS Bases were reviewed to assess their consistency with the proposed changes to STS 3.7.5. The proposed changes to the STS Bases appeared to be consistent with the proposed changes to STS 3.7.5.

4.0 CONCLUSION

Based on a review of the information that was provided and as discussed in the Technical Evaluation Section, the staff has determined that the proposed changes to STS 3.7.5 are appropriate and necessary. The proposed changes are consistent with NRC practices and policies as generally reflected in the STS and as reflected by applicable precedents that have been approved. Therefore, the staff has determined that the proposed changes to STS 3.7.5 should be approved.

Principal Contributors: Stephen Pannier, NRR/ADRO/DIRS/ITSB
James Tatum, NRR/ADES/DSS/SBPB

Enclosure (1)

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ENCLOSURE 2: REQUEST FOR ADDITIONAL INFORMATION (RAI)

REGARDING TSTF-412, REVISION 2, "PROVIDE ACTIONS FOR ONE STEAM SUPPLY TO
TURBINE DRIVEN AFW/EFW PUMP INOPERABLE"

TECHNICAL SPECIFICATIONS TASK FORCE (TSTF)

By letter dated January 31, 2006, the Westinghouse Owners Group (WOG) submitted TSTF-412, Revision 2, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable". The Nuclear Regulatory Commission (NRC) staff has the following questions regarding the information provided:

1. The staff noted a potential inconsistency between Condition D (as proposed) and Condition E (as proposed). Condition E requires immediate action to be taken to restore one AFW/EFW train to operable status and prohibits any mode changes until at least one AFW/EFW train is made operable. This conflicts with Condition D in that it would require that the plant be placed in Mode 4 if a turbine driven AFW/EFW train is restored to the point where it is inoperable solely due to one inoperable steam supply for the pump turbine. Even though the turbine driven AFW/EFW train would be in a condition that requires the plant to be placed in Mode 4 by Condition D, Condition E does not permit a mode change until at least one AFW/EFW train is fully restored to operable status. Please evaluate the proposed Conditions and provide assurance that potentially conflicting requirements such as this one are not inadvertently established.

2. An underlying assumption made in the Safety Evaluation technical analysis is that all PWRs have an AFW/EFW System consisting of two motor driven and one steam turbine driven AFW/EFW pump trains. It is assumed that the motor driven pump trains are each capable of providing either 50% or 100% of the feedwater flow required to bring the plant from all applicable MODES of LCO 3.7.5 to RHR System entry conditions, and that the steam turbine driven AFW/EFW pump train shall be able to provide either 100% or 200% of the required feedwater flow to all steam generators. Furthermore, the steam turbine driven AFW/EFW pump train has the capability to cooldown the plant from all applicable MODES of LCO 3.7.5 to RHR System entry conditions with one inoperable steam supply. The staff would like the WOG to provide descriptions of any or all other PWR AFW/EFW configurations that may not mirror this three train design.

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