

June 28, 2004

TSTF-04-04

Dr. William D. Beckner, Director  
Operating Reactor Improvements Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: TSTF-467, Revision 0, "Add Restriction for Lowest Loop  $T_{ave}$  during Mode 2 Physics Testing"

Dear Dr. Beckner:

Enclosed for NRC review is Revision 0 of TSTF-467, "Add Restriction for Lowest Loop  $T_{ave}$  during Mode 2 Physics Testing."

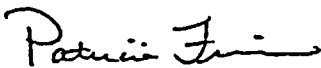
This Traveler is only applicable to NUREG-1430, "Standard Technical Specifications - Babcock and Wilcox Plants," and adds a restriction on RCS loop average temperature during Mode 2 physics testing. This restriction is credited in the Bases of the Specification as necessary to meet the accident analysis assumptions, but the restriction does not appear in the Specification. The change also corrects several errors in the Bases for the Specification.

We request that NRC review of TSTF-467 be granted a fee waiver pursuant to the provisions of 10 CFR 170.11. This Traveler meets the exemption requirement in 10 CFR 170.11(a)(1)(iii), in that it is "a means of exchanging information between industry organizations and the NRC for the specific purpose of supporting the NRC's generic regulatory improvements or efforts." In this case, the generic regulatory effort is NUREG-1430. The Traveler also meets the exemption criteria of 10 CFR 170.11(a)(1)(iii)(A)(I) and 10 CFR 170.11(a)(1)(iii)(C), in that it is specifically for the purpose of supporting NRC's development of generic guidance (i.e., NUREG-1430) and the primary beneficiary is not the requesting organization. This change provides no operational advantage and is only being submitted to improve and correct NUREG-1430. If this change is not granted a fee waiver, please inform us and we will withdraw the Traveler from NRC review.

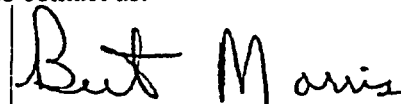
Should you have any questions, please do not hesitate to contact us.



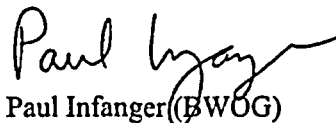
Dennis Buschbaum (WOG)



Patricia Furio (CEOG)



Bert Morris (BWROG)



Paul Infanger (BWOG)

Enclosure



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## Technical Specification Task Force

### Improved Standard Technical Specifications Change Traveler

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#### Add Restriction for Lowest Loop Tave during Mode 2 Physics Testing

NUREGs Affected:  1430  1431  1432  1433  1434

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Classification: 1) Correct Specifications

Recommended for CLIIP?: No

Correction or Improvement: Correction

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Industry Contact: Paul Infanger, (352) 563-4796, paul.infanger@pgnmail.com

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### 1.0 Description

NUREG 1430 LCO 3.1.9 is modified to add a restriction for lowest RCS loop average temperature at [520] F when performing PHYSICS TESTS in MODE 2. LCO 3.1.9 permits suspending the RCS minimum temperature for criticality during PHYSICS TESTS in MODE 2. This additional restriction adds a minimum temperature for criticality when the LCO 3.4.2 requirements are suspended. Additionally, erroneous information has been deleted from the Bases of SR 3.1.9.1.

### 2.0 Proposed Change

An LCO restriction is added to LCO 3.1.9 for the minimum RCS loop average temperature. A corresponding Surveillance and action are also added. The Bases are modified to reflect these changes and to correct errors in the Bases for Surveillance 3.1.9.1.

### 3.0 Background

LCO 3.1.9 suspends the requirements of LCO 3.4.2, RCS Minimum Temperature for Criticality, but does not impose an additional restrictions on RCS minimum temperature. The test exception LCO 3.1.8 in NUREG-1431 contains a restriction on minimum RCS loop average temperature. (The test exceptions in NUREG-1432 do not suspend the minimum RCS loop average temperature requirement.)

### 4.0 Technical Analysis

The added restriction permits loop average temperature to be reduced slightly to perform required tests while still providing a minimum limit for criticality when the requirement of LCO 3.4.2 is suspended. The additional restriction is necessary to ensure assumptions associated with suspending requirements are met during PHYSICS TESTS in MODE 2. The addition of this restriction is consistent with the Applicable Safety Analyses discussion in the Bases for LCO 3.1.9 which takes credit for maintaining the RCS temperature at [520] F.

The Bases for SR 3.1.9.1 discuss a CHANNEL FUNCTIONAL TEST. However, SR 3.1.9.1 is a verification of THERMAL POWER, not a CHANNEL FUNCTIONAL TEST. It appears that the proper Bases for SR 3.1.9.1 is the discussion in the Bases of SR 3.1.9.2. It also appears that the discussions for SR 3.1.9.2 and 3.1.9.3 are actually the discussions in B3.1.9.3 and 3.1.9.4, respectively. Please note that NUREG-1430 does not contain an SR 3.1.9.4. Therefore, this change also corrects the Surveillance Test Requirement Bases discussions so that they are associated with the proper SRs.

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## **5.0 Regulatory Analysis**

### **5.1 No Significant Hazards Consideration**

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change provides a restriction on minimum RCS loop average temperature during physics tests. Performance of physics tests is not an initiator to any accident previously evaluated. Providing a limit on minimum RCS loop average temperature will ensure that systems are capable of performing their assumed mitigation functions. The proposed changes do not adversely affect accident the design assumptions, conditions, or configuration of the facility. The proposed changes do not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended function.

Therefore, it is concluded that this change does not significantly increase the probability of an accident previously evaluated.

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

Response: No.

The proposed change provides a restriction on minimum RCS loop average temperature during physics tests. This revision will not impact the accident analysis. No new or different accidents result. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a significant change in the methods governing normal plant operation. The changes do not alter assumptions made in the safety analysis.

Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

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

Response: No.

The proposed change provides a restriction on minimum RCS loop average temperature during physics tests. The proposed change protects the assumptions of the safety analysis.

Therefore, it is concluded that this change does not involve a significant reduction in the margin of safety.

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

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## **5.2 Applicable Regulatory Requirements/Criteria**

The proposed change does not change the design requirements or the assumptions in the safety analysis. As a result, there is no effect on the applicable regulatory requirements or criteria. 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 approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

## **6.0 Environmental Consideration**

A review has determined that the proposed change would 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 would 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 effluent 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.

## **7.0 References**

None

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## **Revision History**

### **OG Revision 0**

**Revision Status: Closed**

Revision Proposed by: Oconee

Revision Description:  
Original Issue

### **Owners Group Review Information**

Date Originated by OG: 09-Mar-98

Owners Group Comments:  
ONS-027

7/10/98 - TSTF approves with modifications. Noel C. to make changes and send to Don H.

Owners Group Resolution: Superseded Date: 09-Mar-98

### **OG Revision 1**

**Revision Status: Active**

Revision Proposed by: BWOOG

Revision Description:  
Revised to mark on Revision 2 pages and to have an SE quality justification.

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26-Jun-04

**OG Revision 1****Revision Status: Active****Owners Group Review Information**

Date Originated by OG: 12-Jun-03

Owners Group Comments:  
(No Comments)

Owners Group Resolution: Approved Date: 12-Jun-03

**TSTF Review Information**

TSTF Received Date: 05-Sep-03 Date Distributed for Review: 05-Sep-03

OG Review Completed:  BWOG  WOG  CEOG  BWROGTSTF Comments:  
BWOG only.

Remarked on ISTS Revision 3 pages.

TSTF Resolution: Approved

Date: 22-Apr-03

**NRC Review Information**

NRC Received Date: 28-Jun-04

**Affected Technical Specifications**

LCO 3.1.9 PHYSICS TESTS Exceptions - MODE 2

LCO 3.1.9 Bases PHYSICS TESTS Exceptions - MODE 2

Action 3.1.9.D PHYSICS TESTS Exceptions - MODE 2  
Change Description: New ConditionAction 3.1.9.D Bases PHYSICS TESTS Exceptions - MODE 2  
Change Description: New Condition

SR 3.1.9.1 Bases PHYSICS TESTS Exceptions - MODE 2

SR 3.1.9.2 PHYSICS TESTS Exceptions - MODE 2  
Change Description: New SRSR 3.1.9.2 PHYSICS TESTS Exceptions - MODE 2  
Change Description: Renamed SR 3.1.9.3

SR 3.1.9.2 Bases PHYSICS TESTS Exceptions - MODE 2

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SR 3.1.9.2 Bases	PHYSICS TESTS Exceptions - MODE 2
	Change Description: New SR
SR 3.1.9.3	PHYSICS TESTS Exceptions - MODE 2
	Change Description: Renamed SR 3.1.9.4

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**INSERT 1**

D. RCS lowest loop average temperature not within limit.	D.1 Suspend PHYSICS TESTS exceptions.	30 minutes
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**INSERT 2**

SR 3.1.9.2	Verify the RCS lowest loop average temperature is $\geq$ [520] $^{\circ}$ F.	30 minutes
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**INSERT 3****D. 1**

If the RCS lowest loop average temperature is  $<$  [520] $^{\circ}$ F, then 30 minutes is allowed for the operator to restore the RCS lowest loop average temperature to within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. The required Completion Time is consistent with, or more conservative than, those specified in the individual LCOs addressed by the PHYSICS TESTS exceptions.

**INSERT 4****SR 3.1.9.2**

Verification that the RCS lowest loop average temperature is  $\geq$  [520] $^{\circ}$ F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.



## 3.19 REACTIVITY CONTROL SYSTEMS

## 3.1.9 PHYSICS TESTS Exceptions - MODE 2

LCO 3.1.9 During performance of PHYSICS TESTS, the requirements of:

- LCO 3.1.3, "Moderator Temperature Coefficient,"  
 LCO 3.1.4, "CONTROL ROD Group Alignment Limits,"  
 LCO 3.1.5, "Safety Rod Insertion Limits,"  
 LCO 3.1.6, "AXIAL POWER SHAPING ROD Alignment Limits,"  
 LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted  
 operation region only, and  
~~LCO 3.4.2, "RCS Minimum Temperature for Criticality"~~

may be suspended provided that:

- THERMAL POWER is  $\leq 5\%$  RTP,
- Reactor trip setpoints on the OPERABLE nuclear overpower channels are set to  $\leq 25\%$  RTP,
- Nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit is OPERABLE, and
- SDM is within the limits specified in the COLR.

*e. RCS lowest loop average temperature is  $\geq [520]^{\circ}\text{F}$ .*

APPLICABILITY: During PHYSICS TESTS initiated in MODE 2.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER not within limit.	A.1 Open control rod drive trip breakers.	Immediately
B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit.	15 minutes
	<u>AND</u> B.2 Suspend PHYSICS TESTS exceptions.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Nuclear overpower trip setpoint is not within limit.  <u>OR</u>  Nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit inoperable.	C.1 Suspend PHYSICS TESTS exceptions.	1 hour

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.9.1 Verify THERMAL POWER is $\leq$ 5% RTP.	1 hour
SR 3.1.9.2 <sup>3</sup> Verify nuclear overpower trip setpoint is $\leq$ 25% RTP.	8 hours
SR 3.1.9.3 <sup>4</sup> Verify SDM is within the limits specified in the COLR.	24 hours

Insert 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

PHYSICS TESTS include measurement of core nuclear parameters or exercise of control components that affect process variables.

As described in LCO 3.0.7, compliance with Test Exceptions LCOs is optional, and therefore no criteria of 10 CFR 50.36(c)(2)(ii) apply. Test Exceptions LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.

LCO

This LCO permits individual CONTROL RODS to be positioned outside of their specified group alignment and withdrawal limits and to be assigned to other than specified CONTROL ROD groups during the performance of PHYSICS TESTS. In addition, this LCO permits verification of the fundamental core characteristics.

This LCO also allows suspension of LCO 3.1.3, LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, LCO 3.2.1, and LCO 3.4.2, provided:

- a. THERMAL POWER is  $\leq$  5% RTP,
- b. Nuclear overpower trip setpoints on the OPERABLE nuclear power range channels are set to  $\leq$  25% RTP,
- c. Nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit is OPERABLE, and
- d. SDM is maintained within the limits specified in the COLR and

e. RCS loop average temperature is  $\geq$  [520]°F.

The limits of LCO 3.2.3 and LCO 3.2.4 do not apply in MODE 2. Inhibiting CONTROL ROD withdrawal, based on startup rate, also limits local linear heat rate (LHR), departure from nucleate boiling ratio (DNBR), and peak RCS pressure during accidents initiated from low power.

APPLICABILITY

This LCO is applicable when the reactor is either subcritical or critical with THERMAL POWER  $\leq$  5% RTP. The Applicability is stated as "during PHYSICS TESTS initiated in MODE 2" to ensure that the 5% RTP maximum power level is not exceeded. Should the THERMAL POWER exceed 5% RTP, and consequently the unit enter MODE 1, this

BASES

ACTIONS (continued)

specification, in order to ensure that continuity of reactor operation is within initial condition limits. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCOs addressed by PHYSICS TESTS exceptions.

If the nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit function is inoperable, then 1 hour is allowed for the operator to restore the function to OPERABLE status or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCOs addressed by PHYSICS TESTS exceptions.

Insert 3

The nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit function is not required when the reactor power level is above the operating range of the instrumentation channel. For example, if the reactor power level is above the source range channel operating range, then only the intermediate range high startup rate CONTROL ROD withdrawal inhibit is required to be functional.

SURVEILLANCE  
REQUIREMENTS

SR 3.1.9.1

~~Performing a CHANNEL FUNCTIONAL TEST on each nuclear instrumentation source and intermediate range high startup rate CONTROL ROD withdrawal inhibit and nuclear overpower channel, ensures that the instrumentation required to detect a deviation from THERMAL POWER or to detect a high startup rate is OPERABLE. Performing the test once within 24 hours, prior to initiating PHYSICS TESTS, ensures that the instrumentation is OPERABLE shortly before PHYSICS TESTS begin and allows the operator to correct any instrumentation problems.~~

SR 3.1.9.2

Verification that THERMAL POWER is  $\leq 5\%$  RTP ensures that an adequate margin is maintained between the THERMAL POWER level and the nuclear overpower trip setpoint. Hourly verification is adequate for the operator to determine any change in core conditions, such as xenon redistribution occurring after a THERMAL POWER reduction, that could cause THERMAL POWER to exceed the specified limit.

- FYI -

BASES

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SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.9.3

Verification that the nuclear overpower trip setpoint is within the limit specified for PHYSICS TESTS ensures that core protection at the reduced power level is established and will remain in place during PHYSICS TESTS. Performing the verification once per 8 hours allows the operator adequate time for determining any degradation of the established trip setpoint margin before and during PHYSICS TESTS and for adjusting the nuclear overpower trip setpoint.

SR 3.1.9.4

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

- a. RCS boron concentration,
- b. CONTROL ROD position,
- c. RCS average temperature,
- d. Fuel burnup based on gross thermal energy generation,
- e. Samarium concentration,
- f. Xenon concentration,
- g. Isothermal temperature coefficient (ITC), when below the point of adding heat (POAH),
- h. Moderator defect, when above the POAH, and
- i. Doppler defect, when above the POAH.

Using the ITC accounts for Doppler reactivity in this calculation when the reactor is subcritical or critical but below the POAH, and the fuel temperature will be changing at the same rate as the RCS.

The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.

**INSERT 1**

D. RCS lowest loop average temperature not within limit.	D.1 Suspend PHYSICS TESTS exceptions.	30 minutes
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**INSERT 2**

SR 3.1.9.2 Verify the RCS lowest loop average temperature is $\geq$ [520] $^{\circ}$ F.	30 minutes
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**INSERT 3****D. 1**

If the RCS lowest loop average temperature is  $<$  [520] $^{\circ}$ F, then 30 minutes is allowed for the operator to restore the RCS lowest loop average temperature to within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. The required Completion Time is consistent with, or more conservative than, those specified in the individual LCOs addressed by the PHYSICS TESTS exceptions.

**INSERT 4****SR 3.1.9.2**

Verification that the RCS lowest loop average temperature is  $\geq$  [520] $^{\circ}$ F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.