



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

SEP 08 1995

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of ) Docket No. 50-390  
Tennessee Valley Authority )

WATTS BAR NUCLEAR PLANT (WBN) - RESPONSE TO AUGUST 9, 1995,  
CONFERENCE CALL REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING  
METHODOLOGY USED TO DEVELOP COLD OVERPRESSURE MITIGATING SYSTEM  
(COMS) SETPOINTS INCLUDING USE OF RESIDUAL HEAT REMOVAL (RHR)  
SUCTION RELIEF VALVES

This letter provides the requested responses to those questions raised during the August 9, 1995, conference call. Watts Bar Unit 1 plans to implement the concept of a Pressure and Temperature Limits Report consistent with the guidance contained in NUREG-1431, "Standard Technical Specifications Westinghouse Plants." NUREG-1431 requires that the methodology used to determine the heatup and cooldown curves and COMS setpoints be methodology that has been reviewed and approved for use by the NRC and that this methodology be referenced in the administrative controls section of the Technical Specifications. The methodology that Watts Bar has used to develop heatup and cooldown curves is consistent with the methodology contained in WCAP-14040 with the following exceptions: 1) Watts Bar includes instrument uncertainty in the seven EFPY heatup and cooldown curves for operation and COMS setpoints for protecting the 1.5 EFPY steady state pressure/temperature limit curve. The methodology for determining instrument uncertainty is contained in Instrument Society of America (ISA)-67.04 and endorsed by Regulatory Guide 1.105 Revision 2, and 2) Watts Bar has justified the use of the RHR suction relief valve for use in the COMS system based on RHR suction relief valve design and Watts Bar plant specific analyses that is available for review onsite.

TVA understands that the methodology for determining instrument uncertainty contained in ISA-67.04 is approved by NRC's endorsement of the ISA in Regulatory Guide 1.105 Revision 2. The administrative controls section of the WBN Unit 1 Technical

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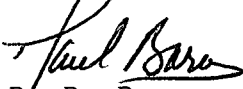
Specifications contain appropriate reference to the methodologies approved for developing heatup and cooldown curves and COMS setpoints. Therefore, TVA considers that Watts Bar Unit 1 has met the guidance stated in NUREG-1431 to allow the use of a PTLR.

Enclosure 1 contains discussion on the justification for use of the RHR suction relief valve in COMS. Enclosure 2 provides a comparison of the COMS setpoints including instrument uncertainty and overshoot showing that the setpoints protect the 1.5 effective fuel power years (EFPY) steady state pressure/temperature limits curve. Enclosure 3 provides a comparison of the RHR suction relief valve setpoint including setpoint tolerance and overshoot to show that the RHR suction relief valve protects the 1.5 EFPY steady state pressure temperature limits curve. The values provided in Enclosures 2 and 3 are draft. In addition, operation in regions with negative margin as shown in Enclosures 2 and 3 is implicitly prohibited by the Technical Specifications. Therefore, compliance with the Technical Specifications would preclude the number of Reactor Coolant Pumps that could be operated to ensure protection of the steady state pressure/temperature limits curve.

TVA Watts Bar previously committed to including instrument uncertainty in the pressure/temperature limits curves and COMS setpoints in Revision 4 of the PTLR which was provided to the NRC in a letter dated July 31, 1995. The instrument uncertainty included in the pressure/temperature limits curve and the COMS setpoints were developed using ISA-67.04. Revisions to the PTLR require that the same methodology identified in Administrative Controls Section of Technical Specifications be used for future changes to the pressure/temperature limits curve or COMS setpoints. Therefore, there are no new commitments contained in this submittal.

If you should have any questions, please telephone John Vorees at (615) 365-8819.

Sincerely,



R. R. Baron  
Nuclear Assurance  
and Licensing Manager (Acting)

Enclosures  
cc: See page 3

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ENCLOSURE 1

JUSTIFICATION FOR USE OF RESIDUAL HEAT REMOVAL (RHR)  
SUCTION RELIEF VALVE

FOR

COLD OVERPRESSURE MITIGATION

The inclusion of the RHR suction relief valve as part of the COMS is considered to be an enhancement as it allows flexibility in usage of the PORVs. The RHR suction relief valve is not required to be part of the COMS because either PORV is capable of sufficient relieving capacity to prevent violation of the Appendix G limits due to the analyzed worst case mass or thermal input. Section 5.2.2.4 of the FSAR describes this capability.

The RHR suction valve, when used in conjunction with one PORV, allows a relieving path in case of a single active failure. As noted in WBN design basis documents, the setpoint of the RHR suction valve is 450 psig with an upper tolerance of 463.5 psig. The 1.5 EFY Appendix G steady state curve (WCAP-14176) has a limit of 550 psig which is 86.5 psig greater than the upper setpoint of the RHR suction relief valve.

The largest mass/thermal input transient is one charging pump at 470 gpm. Calculation WBNASP2-116 documents the relieving capacity of the RHR suction relief valve is at least 480 gpm, which is sufficient relieving capacity to mitigate the largest analyzed transient.

Therefore, the RHR suction relief valve is fully qualified for inclusion in the COMS.

ENCLOSURE 2

COMPARISON OF COMS SETPOINTS TO 1.5 EFPY  
STEADY STATE PRESSURE TEMPERATURE LIMITS CURVE

# DRAFT

## COMS SETPOINTS INCLUDING INSTRUMENT UNCERTAINTY COMPARED TO 1.5 EFY STEADY STATE FOR HEATUP\*

PORV 334						
TEMP °F	SETPOINT** (PSIG)	OVERSHOOT (PSIG)	INSTRUMENT UNCERTAINTY (PSIG)*****	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)***	MARGIN (PSIG)
70	388	26.60	48.64	463.24	470.13****	+6.89
100	393	51.50	64.28	508.78	509.33	+5.55
150	462	110.30	59.80	632.10	647.61	+15.51
200	515	221.70	51.19	787.89	931.22	+143.33
250	533	203.00	50.81	786.81	1509.90	+723.09
275	565	120.00	49.87	734.87	1990.38	+1255.51
300	565	78.00	48.99	691.99		
350	745					

\* Based on four (4) pump operation above 105°F (RHR intersection of Appendix G curve).

\*\* Setpoint has been reduced by 74 psig to compensate for the pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\* Pressure value has been reduced by 74 psig to compensate for pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\*\* Pressure value corresponds to 75°F.

\*\*\*\*\* Pressure transmitters 1-PT-68-66 and 1-PT-68-68 are required to be calibrated within thirty (30) days of starting RCS heatup.

# DRAFT

## COMS SETPOINTS INCLUDING INSTRUMENT UNCERTAINTY COMPARED TO 1.5 EPFY STEADY STATE FOR COOLDOWN\*

PORV 334						
TEMP °F	SETPOINT** (PSIG)	OVERSHOOT (PSIG)	INSTRUMENT UNCERTAINTY (PSIG)	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)***	MARGIN (PSIG)
70	388	26.60	58.92	473.52	492.13****	+18.61
100	393	51.50	72.37	516.87	531.33	+14.46
150	462	112.30	68.42	642.72	669.61	+26.89
200	515	222.70	61.05	798.75	953.22	+154.47
250	533	175.00	60.73	768.73	1531.90	+763.17
275	565	80.00	59.94	704.94	2012.38	+1307.44
300	565	65.00	59.21	689.21		
350	745					

\* Based on three (3) pump operation below 350°F.

\*\* Setpoint has been reduced by 52 psig to compensate for the pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\* Pressure value has been reduced by 52 psig to compensate for pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\*\* Pressure value corresponds to 75°F.

# DRAFT

## COMS SETPOINTS INCLUDING INSTRUMENT UNCERTAINTY COMPARED TO 1.5 EFPY STEADY STATE FOR COOLDOWN\*

PORV 340A						
TEMP °F	SETPOINT** (PSIG)	OVERSHOOT (PSIG)	INSTRUMENT UNCERTAINTY (PSIG)	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)***	MARGIN (PSIG)
70	368	26.60	71.21	464.81	492.13****	+27.32
100	373	51.50	82.83	507.33	531.33	+24.00
150	447	112.30	79.81	639.11	669.61	+30.50
200	495	222.70	72.10	789.80	953.22	+163.42
250	513	175.00	71.22	759.22	1531.90	+772.68
275	527	8000	71.27	678.27	2012.38	+1334.11
300	527	65.00	71.04	663.04		
350	690					

\* Based on three (3) pump operation below 350°F.

\*\* Setpoint has been reduced by 52 psig to compensate for the pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\* Pressure value has been reduced by 52 psig to compensate for pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\*\* Pressure value corresponds to 75°F.



# DRAFT

## COMS SETPOINTS INCLUDING INSTRUMENT UNCERTAINTY COMPARED TO 1.5 EPFY STEADY STATE FOR HEATUP\*

PORV 340A						
TEMP °F	SETPOINT** (PSIG)	OVERSHOOT (PSIG)	INSTRUMENT UNCERTAINTY (PSIG)	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)***	MARGIN (PSIG)
70	368	26.60	70.26	464.86	470.13****	+5.27
100	373	51.50	82.01	506.51	509.33	+2.82
150	447	110.30	78.96	636.26	647.61	+11.35
200	495	221.70	71.15	787.85	931.22	+143.37
250	513	203.00	70.26	786.26	1509.90	+723.64
275	527	120.00	70.31	717.31	1990.38	+1273.07
300	527	78.00	70.08	675.08		
350	690					

\* Based on four (4) pump operation above 105°F (RHR intersection of Appendix G curve).

\*\* Setpoint has been reduced by 74 psig to compensate for the pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\* Pressure value has been reduced by 74 psig to compensate for pressure differential between the reactor vessel midplane and the pressure transmitter.

\*\*\*\* Pressure value corresponds to 75°F.

ENCLOSURE 3

COMPARISON OF RHR SUCTION RELIEF VALVE SETPOINT TO 1.5 EFPY  
STEADY STATE PRESSURE TEMPERATURE LIMITS CURVE

# DRAFT

## RHR RELIEF VALVE SETPOINT INCLUDING SETPOINT DRIFT AND OVERSHOOT COMPARED TO 1.5 EPFY STEADY STATE CURVE FOR COOLDOWN\*

1-RFV-074-0505-S						
TEMP °F	SETPOINT (PSIG)	OVERSHOOT (PSIG)	SETPOINT DRIFT PLUS PRESSURE DIFFERENTIAL (PSIG)**	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)	MARGIN (PSIG)
70	450	45.00	55.50	550.50	544.13***	-5.87
100	450	45.00	55.50	550.50	583.55	+33.05
150	450	45.00	55.50	550.50	721.61	+171.11
200	450	45.00	55.50	550.50	1005.22	+454.72
250	450	45.00	55.50	550.50	1583.90	+1033.40
275	450	45.00	55.50	550.50	2064.38	+1513.88
300	450	45.00	55.50	550.50		
350	450					

\* Based on two (2) pump operation below 160°F.

\*\* Setpoint drift is 3% of setpoint plus 42 psig to compensate for pressure differential between the reactor vessel midplane and RHR Relief Valve 1-RFV-074-0505-S.

\*\*\* Pressure value corresponds to 75°F.

# DRAFT

## RHR RELIEF VALVE SETPOINT INCLUDING SETPOINT DRIFT AND OVERSHOOT COMPARED TO 1.5 EPFY STEADY STATE CURVE FOR HEATUP\*

1-RFV-074-0505-S						
TEMP °F	SETPOINT (PSIG)	OVERSHOOT (PSIG)	SETPOINT DRIFT PLUS PRESSURE DIFFERENTIAL (PSIG)**	PEAK PRESSURE (PSIG)	STEADY STATE (PSIG)	MARGIN (PSIG)
70	450	45.00	91.50	586.50	544.13***	-42.37
100	450	45.00	91.50	586.50	583.55	-2.95
150	450	45.00	91.50	586.50	721.61	+135.11
200	450	45.00	91.50	586.50	1005.22	+418.72
250	450	45.00	91.50	586.50	1583.90	+997.40
275	450	45.00	91.50	586.50	2064.38	+1477.88
300	450	45.00	91.50	586.50		
350	450					

\* Based on four (4) pump operation above 105°F (RHR intersection of Appendix G curve).

\*\* Setpoint drift is 3% of setpoint plus 78 psig to compensate for pressure differential between the reactor vessel midplane and RHR Relief Valve 1-RFV-074-0505-S.

\*\*\* Pressure value corresponds to 75°F.