

SAFETY EVALUATION  
BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT, UNITS 1  
FIRST CYCLE CORE OPERATING LIMITS REPORT  
DOCKET NO. 50-390

1.0 INTRODUCTION

By letter dated March 19, 1993, Tennessee Valley Authority (TVA, the applicant) submitted the Watts Bar Unit 1, Cycle 1, Core Operating Limits Report (COLR), which specifies cycle-specific parameter limits. The submittal also includes the addition of the COLR to the Definitions section of the Technical Specifications (TS) and to the reporting requirements of the Administrative Controls section of draft TS. Guidance on the proposed changes for COLR was developed by NRC and provided to all power reactor licensees and applicants by Generic Letter (GL) 88-16, dated October 4, 1988.

2.0 EVALUATION

Watts Bar Unit 1's TS are under development. In accordance with GL 88-16, the draft TS references the COLR in the following ways:

2.1 Parameter Limits

The definition section of the TS include the COLR that requires cycle/reload-specific parameter limits to be established on a unit-specific basis in accordance with NRC-approved methodologies that maintain the limits of the safety analysis. The definition notes that plant operation within these limits is addressed by individual specifications.

2.2 Proposed Limits

The following limits were proposed, and are referenced by various sections of the draft TS:

2.2.1 Draft TS, LCO 3.1.4

The Moderator Temperature Coefficient (MTC) limits are specified in the COLR.

2.2.2 Draft TS, LCO 3.1.6

The Shutdown Bank Insertion Limits for this LCO are specified in the COLR.

2.2.3 Draft TS, LCO 3.1.7

The Control Bank Insertion Limits for this LCO are specified in the COLR.

2.2.4 Draft TS, LCO 3.2.1

The Heat Flux Hot Channel Factor ( $F_q(Z)$ ) limit at rated thermal power, the normalized  $F_q(Z)$  limit as a function of core height  $K(Z)$ , and a cycle-dependent function  $W(Z)$  to account for power distribution transient encountered during normal operation for this LCO are specified in the COLR.

2.2.5 Draft TS, LCO 3.2.2

The Nuclear Enthalpy Rise Hot Channel Factor ( $F_H^N$ ) limit for this LCO is specified in the COLR.

2.2.6 Draft TS, LCO 3.2.3

The Axial Flux Difference (AFD) limits for this LCO are specified in the COLR.

2.2.7 TS, LCO 3.9.1

The Boron Concentration limit ( $\Rightarrow$  2000 ppm) for this LCO is specified in the COLR.

2.3 Administrative Control

Specification 5.9.1.6 is added to the draft TS to mention the COLR under the reporting requirements of the Administrative Control section of the draft TS. This specification requires that the COLR be submitted, upon issuance, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector. The report provides the values of cycle-specific parameter limits that are applicable for the current fuel cycle. Furthermore, this specification requires that the NRC-approved methodologies be used in establishing the values of these limits for the relevant specifications, and that the values be consistent with all applicable limits of the safety analysis. The approved methodologies are the following:

- (a) WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

Methodology for Specifications 3.1.4 - Moderator Temperature Coefficient; 3.1.6 - Shutdown Bank Insertion Limit; 3.1.7 - Control Bank Insertion Limits; 3.2.1 - Heat Flux Hot Channel Factor; 3.2.2 - Nuclear Enthalpy Rise Hot Channel Factor, 3.2.3 - Axial Flux Difference, and 3.9.1 - Boron Concentration.

- (b) WCAP-10266-P-A Revision 2, "The 1981 Version of Westinghouse Evaluation Model Using Bash Code," March 1987.

Methodology for Specification 3.2.1 - Heat Flux Hot Channel Factor.

- (c) WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control  $F_0$  Surveillance Technical Specification," June 1983.

Methodology for Specifications 3.2.1 - Heat Flux Hot Channel Factor (W(Z) Surveillance Requirements for  $F_0$  methodology) and 3.2.3 - Axial Flux Difference (Relaxed Axial Offset Control)).

Finally, the specification requires that all changes in cycle-specific parameter limits be documented in the COLR before each reload cycle or remaining part of a reload cycle, and submitted to the NRC prior to operation with the new parameter limits.

### 3.0 CONCLUSION

Based on the result of its review, the staff finds that the applicant's proposed cycle-specific limits specified in the COLR acceptable since they are in accordance with the guidance of Generic Letter 88-16. The staff also finds the proposed methodologies acceptable since they are all documented in approved topical reports.

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Dated: September 20, 1993