UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 1, 2010

Mr. Ashok Bhatnagar
Senior Vice President
Nuclear Generation Development
and Construction
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – SAFETY EVALUATION REGARDING BULLETIN 1996-01, "CONTROL ROD INSERTION PROBLEMS" (TAC NO. MD6707)

Dear Mr. Bhatnagar:

By letter dated September 7, 2007 (Agencywide Document Access and Management System Accession No. ML072570676), as supplemented March 31, 2010, the Tennessee Valley Authority (TVA) submitted a response to U.S. Nuclear Regulatory Commission (NRC) Bulletin 1996-01, "Control Rod Insertion Problems," for Watts Bar Nuclear Plant (WBN), Unit 2.

The NRC staff has reviewed TVA's response. Enclosed is the NRC staff's safety evaluation. This completes the NRC staff's efforts regarding WBN Unit 2 for TAC No. MD6707.

Sincerely,

L. Raghavan, Chief
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure: As stated

cc w/encl: Distribution via Listserv

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO BULLETIN 1996-01, "CONTROL ROD INSERTION PROBLEMS" TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT, UNIT 2 DOCKET NO. 50-391

1.0 INTRODUCTION

In a letter dated September 7, 2007 (Agency Document Access and Management System Accession No. ML072570676), as supplemented March 31, 2010, the Tennessee Valley Authority (TVA) submitted a response to U.S. Nuclear Regulatory Commission (NRC) Bulletin (BL) 1996-01, "Control Rod Insertion Problems," for Watts Bar Nuclear Plant (WBN), Unit 2.

2.0 REGULATORY EVALUATION

The general design criteria (GDC) establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems and components important to safety. The applicable GDC for BL 1996-01 are GDC 26, "Reactivity control system redundancy and capability" and GDC 27, "Combined reactivity control systems capability." GDC 26 specifies that control rods shall be designed to reliably control reactivity changes during normal operation, including anticipated operational occurrences to ensure acceptable fuel design limits are not exceeded. GDC 27 specifies that the reactivity control system shall be designed with appropriate margin to control reactivity changes and assure that under postulated accident conditions that the capability to cool the core is maintained.

3.0 TECHNICAL EVALUATION

The objective of BL 1996-01 is to verify that the licensee is complying with the current licensing basis for WBN Unit 2 with respect to shutdown margin and control rod drop times. The basis for BL 1996-01 was incomplete rod insertion (IRI) events, which were found to occur with fuel assemblies of moderate burnup due to irradiation growth. Since BL 1996-01, most Westinghouse fuel assembly designs have been modified under the Westinghouse Fuel Criteria Evaluation Process to be less vulnerable to IRI. WBN Unit 2 had never achieved criticality; therefore, its next core will be its initial core.

Based on the TVA letter dated March 31, 2010, it is expected the initial core will contain all fresh fuel, which will include the modifications to make the rods less vulnerable to IRI.

TVA response included a list of tests that will be performed during power ascension, a statement that emergency operating procedures (EOP) will direct operators to verify that all control rods are fully inserted and initiate boration if they are not, and provide a pre-startup core map to the NRC staff 6-months prior to fuel load indicating the rodded fuel assemblies and a projected end of cycle burnup of each rodded assembly for the initial fuel cycle.

The NRC staff has reviewed TVA's response and finds the actions to be adequate to address BL 1996-01.

4.0 CONCLUSION

The NRC staff concludes that TVA's response to BL 1996-01 is acceptable based on TVA adequately addressing the verification of operability by providing information that shows rod control system operability will be demonstrated during power ascension. The list of tests to be performed was provided. In addition, the NRC staff also concludes there is reasonable assurance that TVA operator actions will be acceptable in response to an IRI event by creating a specific EOP to mitigate the event.

In TVA's response, it stated that TVA will provide a pre-startup map to the NRC staff indicating the rodded fuel assemblies and a projected end of cycle burnup of each rodded assembly for the initial fuel cycle 6-months prior to fuel load. The NRC staff finds this response to be acceptable.

Principle Contributors: Kent Wood, Justin Heinly, and John G. Lamb

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