



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

March 4, 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 1996-02, “MOVEMENT OF HEAVY LOADS OVER
SPENT FUEL, OVER FUEL IN THE REACTOR CORE, OR OVER
SAFETY-RELATED EQUIPMENT” (TAC NO. MD6708)

Dear Mr. Bhatnager:

In a letter dated September 7, 2007 (see Agencywide Document Access and Management System Accession No. ML072570676), which references letter dated July 28, 1993, the Tennessee Valley Authority (TVA) submitted a response to U.S. Nuclear Regulatory Commission (NRC) Bulletin 1996-02, “Movement of Heavy Loads over Spent Fuel, over Fuel in the Reactor Core, or over Safety-Related Equipment,” 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. MD6708.

Sincerely,

A handwritten signature in black ink, appearing to read "L. Raghavan", with a long horizontal flourish extending to the right.

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

Docket No. 50-391

Enclosure: Safety Evaluation

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SAFETY EVALUATION BY THE
OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO
BULLETIN 1996-02, "MOVEMENT OF HEAVY LOADS OVER SPENT FUEL,
OVER FUEL IN THE REACTOR CORE, OR OVER SAFETY-RELATED EQUIPMENT"
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-391

1.0 INTRODUCTION

In a letter dated September 7, 2007 (see Agencywide Document Access and Management System Accession No. ML072570676), which references letter dated July 28, 1993, the Tennessee Valley Authority (TVA) submitted a response to U.S. Nuclear Regulatory Commission (NRC) Bulletin (BL) 1996-02, "Movement of Heavy Loads over Spent Fuel, over Fuel in the Reactor Core, or over Safety-Related Equipment," for Watts Bar Nuclear Plant (WBN), Unit 2.

2.0 REGULATORY EVALUATION

The following General Design Criteria from Appendix A to Title 10 of the *Code of Federal Regulations* Part 50 apply:

Criterion 2, "Design bases for protection against natural phenomena," structures, systems, and components (SSCs) important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions. The design bases for these SSCs shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.

Criterion 5, "Sharing of structures, systems, and components," SSCs important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

Enclosure

Criterion 61, "Fuel storage and handling and radioactivity control," the fuel storage and handling, radioactive waste, and other systems that may contain radioactivity shall be designed to assure adequate safety under normal and postulated accident conditions. These systems shall be designed (1) with a capability to permit appropriate periodic inspection and testing of components important to safety, (2) with suitable shielding for radiation protection, (3) with appropriate containment, confinement, and filtering systems, (4) with a residual heat removal capability having reliability and testability that reflects the importance to safety of decay heat and other residual heat removal, and (5) to prevent significant reduction in fuel storage coolant inventory under accident conditions.

Criterion 62, "Prevention of criticality in fuel storage and handling," criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations.

3.0 TECHNICAL EVALUATION

On April 11, 1996, the NRC issued BL 1996-02, "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment," to all holders of operating licenses. The NRC issued BL 1996-02 for three principal reasons:

1. Alert addressees to the importance of complying with existing regulatory guidelines associated with the control and handling of heavy loads at nuclear power plants,
2. Request that all addressees review their plans and capabilities for handling heavy loads in accordance with existing regulatory guidelines and within their licensing basis as previously analyzed in the final safety analysis report, and
3. Require addressees to report to the NRC whether, and to what extent, they have complied with the actions requested in this bulletin.

Also, the bulletin requested that TVA determine whether current activities were within the licensing basis and to submit a license amendment request as necessary.

In Section 9.1.4, "Fuel Handling System," of NUREG-0847 Supplement 3 (SSER 3), "Safety Evaluation Report related to the operation of Watts Bar Nuclear Plant, Units 1 and 2" (ML072060520), the NRC staff stated that it was reviewing TVA's response to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." TVA replied by letters dated February 6 and March 20, 1984. To ensure completion of Phase I of NUREG-0612 guidelines in a timely manner (pending completion of the staff's review of TVA's response), the NRC staff stated that the following license condition (proposed License Condition No. 39) would be placed in the operating license:

The applicant will meet the guidelines of Sections 5.1.1 and 5.1.3 of NUREG-0612 (Phase I) before the first refueling outage.

By letter dated July 28, 1993 (ML073230481), TVA revised its response to the guidelines of NUREG-0612. The July 28, 1993, letter superseded TVA's responses of February 6 and March 20, 1984. The revised response reflected the substantial redesign and procurement of lifting devices that had occurred during the time since the 1984 letters.

Phase I of NUREG-0612 covered the following areas:

- (1) definition of safe load paths
- (2) development of load-handling procedures
- (3) periodic inspection and testing of cranes
- (4) qualifications, training, and specified conduct of operators
- (5) special lifting devices that should satisfy the guidelines of ANSI N14.6.6 (American National Standards Institute standard)
- (6) lifting devices not specially designed that should be installed and used in accordance with the guidelines of ANSI B30.9
- (7) design of cranes to ANSI B30.2 or CMAA-80 (Crane Manufacturers Association of America standard)

Phase II of NUREG-0612 addressed the need for electrical interlocks/mechanical stops or, alternatively, single-failure-proof cranes or load-drop analyses in the spent fuel area, the containment, and in other areas containing safety-related equipment.

The NRC staff reviewed TVA's response dated July 28, 1993, and concluded in SSER 13 (ML072060484) that TVA satisfied the guidelines of Phase I. The NRC staff, therefore, concluded that proposed License Condition No. 39 was no longer necessary.

In Generic Letter 85-11 (Completion of Phase II of "Control of Heavy Loads at Nuclear Power Plants," NUREG-0612) dated June 28, 1985, the NRC staff found that, with consideration of other factors in the review, satisfaction of the Phase I guidelines ensured that the potential for a heavy load drop was extremely small. The NRC staff, therefore, concluded in SSER 13 that the guidelines of Phase I adequately provide the intended level of protection against load-drop accidents and that a detailed review of the Phase II response was not necessary. However, the NRC staff performed a cursory review in SSER 13 of TVA's response to Phase II of NUREG-0612 and concluded that the Phase II guidelines had been adequately addressed. The NRC staff concluded in SSER 13 that the heavy-load-handling systems conform to the guidelines of NUREG-0612, and were, therefore, acceptable.

In response to BL 1996-02, TVA provided a letter dated May 13, 1996 (ML082401228), for the WBN Unit 1. The May 13, 1996, letter provided both the information requested and the responses required by BL 1996-02. By letter dated May 20, 1998 (ML073250313), the NRC staff reviewed of the responses to BL 1996-02 for WBN Unit 1 and found that, overall, the responses were acceptable.

In letter, dated September 7, 2007, TVA stated that:

Watts Bar Nuclear Plant Unit 1 and Unit 2 have two common storage areas, one for new fuel and one for spent fuel. Heavy load lifts over fuel assemblies are performed under the operating license for Unit 1. The WBN Technical Requirements Manual (TRM) prohibits loads greater than 2059 pounds from travel over fuel assemblies. This ensures that objects traversing the pool are within the design basis and will not cause an unsafe condition if accidentally dropped.

As part of TVA's response to NUREG-0612 (letter dated July 28, 1993), TVA committed that the Watts Bar Unit 2 Heavy Loads Program would be in compliance with requirements by Unit 2 fuel load.

The NRC staff has reviewed TVA's response, dated September 7, 2007, and confirmed that the required response for WBN Unit 2 is identical to WBN Unit 1. Since the WBN Unit 1 response was previously accepted by the NRC staff by letter dated May 20, 1998, the staff finds the response for WBN Unit 2 acceptable.

4.0 CONCLUSION

Staff Requirements Memorandum (SRM), dated July 25, 2007 (ML072060688), for SECY-07-0096 – "Possible Reactivation of Construction and Licensing Activities for the Watts Bar Nuclear Plant Unit 2," stated:

The Commission supports a licensing review approach that employs the current licensing basis for Unit 1 as the reference basis for the review and licensing of Unit 2.

In accordance with the SRM for SECY-07-0096, the NRC staff finds that TVA's responses for WBN Unit 2 regarding BL 1996-02 are acceptable for the movement of heavy loads over spent fuel, over fuel in the reactor core, or over safety-related equipment.

Principle Contributor: John G. Lamb

Date: March 4, 2010

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Sincerely,

/RA/

L. Raghavan, Chief
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