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

November 18, 2011

Mr. Michael D. Skaggs
Senior Vice President
Nuclear Generation Development
and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING SUPPLEMENTAL SAFETY EVALUATION REPORT OPEN ITEM 26 (TAC NO. ME0853)

Dear Mr. Skaggs:

By letter dated April 6, 2011, Tennessee Valley Authority (TVA) responded to open items published in Appendix HH of NUREG-0847, Supplement 22, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2." The U.S. Nuclear Regulatory Commission (NRC) staff has been reviewing the information provided by TVA in support of the operating license application for Watts Bar Nuclear Plant, Unit 2.

After reviewing the response provided by TVA, the NRC staff has determined that additional information is needed to complete its review.

A response is required within 30 days of receipt of this letter as agreed to by your staff. If you cannot provide your response within the required time, please provide a letter to the NRC staff with the reason and a new date for your response.

If you should have any questions, please contact me at 301-415-2048.

Sincerely,

Justin C. Poole, Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

WATTS BAR NUCLEAR PLANT, UNIT 2

SAFETY EVALUATION REPORT

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

## BACKGROUND

In letter dated April 6, 2011, Tennessee Valley Authority (TVA) provided responses to Open Item 26 in Appendix HH of NUREG-0847 "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2" Supplement 22. In this letter, TVA stated that there are four diesel generators (DGs) that supply onsite power to both Units 1 and 2 at Watts Bar Nuclear Plant. Each DG is aligned to supply power to its dedicated shutdown boards. Each Unit has redundant shutdown boards and one train in each unit is capable of powering the loads required to mitigate the consequences of an accident or safely shut down the unit in the event of loss of offsite power. The response provided a tabulation of calculated loading for each board and concluded that there is adequate margin between the rating of the DG and postulated loading. In letter dated July 31, 2010, the licensee, in response to Requests for Additional Information had also provided worst case postulated loading for all four DGs. Specifically, the licensee provided details on the following loading sequences for DG 2B-B, which is considered to have highest loading:

I. Maximum Steady-State Running Load, 0 hours to 2 hours. According to the April 6, 2011, letter, the maximum loading of 4123.56 kVA is on DG 2B-B, which has a margin of 30.8 percent when compared to *short* term rating of 6050 kVA. The corresponding values in the July 31, 2010, letter are 4831.87 kVA and 6050 kVA rating with 19.9-percent margin.

II. Maximum Steady-State Running Load, 2 hours to End. According to the April 6, 2011, letter, the maximum loading of 3702.44 kW is on DG 2B-B, which has a margin of 15.8 percent when compared to *continuous* rating of 4400 kW. The corresponding values in the July 31, 2010, letter are 4198.79 kW with a 4400 kW rating and 4.97-percent margin.

III. Maximum Starting + Running (Transient) Loading, 0 to 180 seconds. According to the April 6, 2011, letter, the maximum loading of 3806.81 kW is on DG 2B-B, which has a margin of 20.4 percent when compared to *cold* engine capability of 4785 kW. The corresponding values in the July 31, 2010, letter are 3878.36 kW with a rating of 4785 kW and a margin of 17.7 percent.

IV. Maximum Starting + Running (Transient) Loading, 180 second to end. According to the April 6, 2011, letter, the maximum loading of 3997.23 kW is on DG 2B-B, which has a margin of 21.2 percent when compared to *hot* engine capability of 5073 kW. The corresponding values in the July 31, 2010, letter are 4755.44 kW with a rating of 5073 kW and 6.2-percent margin.

V. Maximum step load increase, 0 seconds to end. According to the April 6, 2011, letter, DG 2B-B has a maximum loading of 3725.01 kW with a *step load* capability of 8000 kW and a margin of 53.4 percent. The corresponding values in the July 31, 2010, letter are 3944.21 kW on an 8000 kW rating with 45.0-percent margin.

REQUEST FOR ADDITIONAL INFORMATION

The licensee has attempted to demonstrate design margin based on 'hot and cold' engine capability and 'step load' capability. These ratings are not normally cited for DGs in nuclear power plant applications. The Final Safety Analysis Report (FSAR) states that the DG rating is 4400 kW continuous and 4840 kW for 2 hours out of 24 at a power factor of 0.8.

1. Based on the above information, the staff has the following questions:

   a) Explain the variations in the worst-case loading provided in different responses and provide a summary of current calculations depicting DG loading, including procedurally required loads that may be manually connected.

   b) Provide verification or test documents from manufacturer or Appendix B qualified supplier of DG engine and DG generator certifying the 'hot, cold and step load' capabilities.

2. In Table 8.3-14 of FSAR Amendment 106, TVA listed the major electrical equipment that could become submerged following a loss-of-coolant accident (LOCA). The listed equipment is either automatically de-energized or is not required to function after a LOCA. In Sections 8A and 8B, TVA summarized the analysis of submerged (post-LOCA) electrical equipment powered from the auxiliary power system and from the instrumentation and control power system. The analysis concluded that submerged electrical equipment will not degrade the 6.9-kV or 480-V Class 1E instrumentation and control power systems. Identify the equipment and the related power source(s) and explain the consequences of gradual submergence of AC and DC powered equipment that is not qualified or not required postaccident but may be energized and results in simultaneous high impedance faults on the electrical system.

3. To demonstrate compliance with station blackout (SBO) rule, TVA performed a steady-state heat-up analyses in accordance with NUMARC 87-00 guidelines to determine the effects of loss of ventilation in main control room complex, turbine-driven auxiliary feedwater pump room, north and south main steam valve rooms, 125V vital battery rooms, 125V vital battery board rooms, cable spreading room, pipe chase, 480V board rooms, and 6.9kV and 480V shutdown board room. From these analyses, provide a detailed list of equipment that is subjected to temperatures above the design temperature for normal operation and the results of assessment performed for the equipment to show its continued operability during an SBO event.

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Justin C. Poole, Project Manager
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| DATE | 11/08/11 | 11/08/11 | 11/10/11 | 11/16/11 | 11/18/11 |