



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

April 25, 2011

Mr. Ashok S. Bhatnagar
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 GENERIC LETTER 2004-02, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS ROUND 2 (TAC NO. MD6726)

Dear Mr. Bhatnagar:

By letter dated March 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110680248), the Tennessee Valley Authority (TVA) submitted its response to Generic Letter 2004-02 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," for Watts Bar Nuclear Plant, Unit 2. This submittal supersedes a previous response letter dated September 10, 2010 (ADAMS Accession No. ML102580175).

The U.S. Nuclear Regulatory Commission staff has reviewed the information provided by TVA and finds that additional information is needed to complete its review. The specific questions are in the enclosed request for additional information.

A response is required within 15 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,

A handwritten signature in black ink, appearing to read "Justin C. Poole".

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

GENERIC LETTER 2004-02

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

The Nuclear Regulatory Commission (NRC) staff has reviewed Tennessee Valley Authority's letter dated March 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110680248), related to the actions and evaluations taken to resolve Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004.

Debris Generation

- 1) According to the Break Selection Evaluation, mineral wool is installed in limited locations, but was stated to not be within any loss-of-coolant accident (LOCA) zone of influence (ZOI). No ZOI size was provided for the mineral wool material. The basis for excluding the mineral wool as potential debris was not provided. Provide information to justify that the mineral wool cannot become transportable debris. Alternately, provide information to justify that the design basis debris load bounds any alternate debris load that includes the mineral wool.

Head Loss and Vortexing

- 1) The design basis assumes 750 ft² sacrificial strainer area for miscellaneous debris (Section 3.b of submittal). During testing, the NRC staff understood that scaling included a 200 ft² sacrificial area, as documented in the staff's trip report (ML102160226). Please reconcile this discrepancy.
- 2) The application did not include a plot of the test strainer head loss as a function of time for the design basis test, annotated with significant events during the test, as described in the revised content guide for GL 2004-02 supplemental responses (ADAMS Accession No. ML073110278). The NRC staff reviews the plot to validate extrapolation of test results to the mission time, and to ensure that pressure-driven bed discontinuities did not affect the debris head loss (such that temperature scaling may be inappropriate). Provide an annotated plot of the design basis test.
- 3) Provide the methodology used for extrapolation of head loss values to the 30-day mission time, including any statistical methodology employed.

Net Positive Suction Head

- 1) It is unclear how the margins reported for residual heat removal switchover time and containment spray system (CSS) switchover time are consistent with the strainer submergence values reported in section 3.f.2 of the Watts Bar 2 submittal. For the

Enclosure

limiting case of small-break LOCA (SBLOCA), the minimum sump level is stated to increase from 5.78 ft to 6.91 ft from the time of emergency core cooling system recirculation to the time of CSS recirculation. This would contribute to a net positive suction head (NPSH) margin of 1.1 ft. The NPSH section of the submittal states that NPSH margin increases by about 3.7 ft when comparing similar conditions. The change in submergence for a large-break LOCA reported in section 3.f.2 (3.4 ft) is closer to this value. There may be a discrepancy in the reported minimum sump level at CSS recirculation for the SBLOCA case. Clarify the water levels and discuss how the NPSH margins reported in section 3.g.16 were calculated.

- 2) For SBLOCAs, Enclosure 3 indicates that the minimum water level calculation assumes the reactor coolant system (RCS) will contribute inventory to the reactor cavity. The applicant calculates RCS shrinkage, due to cooling of the primary inventory, and subtracts this value to reduce the amount of water that reaches the containment sump. It is not clear to the staff that the calculations account for the inventory required to refill the RCS, such that the stated amounts provide for conservative estimates of minimum sump level. The NRC staff's position is that the applicant should account for the potential for the RCS to become completely filled with water at its ultimate equilibrium temperature. The staff understands that the levels may have been calculated correctly and that ice melt will contribute inventory at a rate exceeding the rate required to account for RCS refill and cooldown. Provide information to demonstrate that the minimum sump level has determined properly considering the above discussion.

April 25, 2011

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Sincerely,

/RA/

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

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ADAMS Accession No.: ML111091048

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