



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

June 13, 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 SEVERE ACCIDENT MANAGEMENT DESIGN
ALTERNATIVE REVIEW – JUNE 2011 (TAC NO. MD8203)

Dear Mr. Bhatnagar:

By letter dated October 14, 2010, as supplemented by letters dated January 31, March 30, May 13, and May 25, 2011 (Agencywide Documents Access and Management System Accession Nos. ML102910629, ML110340347, ML110820858, ML11145A088, and ML11147A099, respectively), the Tennessee Valley Authority submitted an updated Severe Accident Management Design Alternatives (SAMDA) for Watts Bar Nuclear Plant, Unit 2.

In an effort to complete the Nuclear Regulatory Commission staff review, enclosed is a request for additional information regarding the SAMDA analysis.

A response is required 14 days from the date of this letter.

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
SEVERE ACCIDENT MITIGATION ALTERNATIVES
TENNESSEE VALLEY AUTHORITY
DOCKET NO. 50-391

The following questions refer to responses to requests for additional information (RAIs) provided in letter dated May 25, 2011.

1. Clarification 2

The response does not clearly state how the unavailability of Unit 1 or shared components are accounted for in determining the annual averaged Unit 2 core damage frequency (CDF) and risk. Specifically, how is the potential higher unavailability of these items, during Unit 1 outages, incorporated?

The response talks about technical specification requirements and that they use the maintenance rule data but that the maintenance rule data doesn't include unavailability when the item is not required. Take the example of a Unit 1 emergency diesel generator (EDG) that supplies power to the Unit 1 shutdown board and is credited for Unit 2 by cross-tying of the shutdown boards. The Unit 1 EDG has a listed unavailability due to testing and maintenance of 0.02 (based on the Tennessee Valley Authority (TVA) list of risk reduction worth, typical for EDGs), while Unit 1 is at power (say, for simplicity, 95 percent of the year (yr)). Thus, with Unit 1 at power for 0.95 yr, the Unit 1 EDG is unavailable for $0.02 \times 0.95 \text{ yr} = 0.019 \text{ yr}$. However, there is an additional 0.05 yr (the 5 percent of the time Unit 1 is not at power) when the Unit 1 EDG could be unavailable if needed for Unit 2, such that the unavailability of the Unit 1 EDG for use at Unit 2 ranges from 0.019 yr to $0.019 \text{ yr} + 0.05 \text{ yr} = 0.069 \text{ yr}$. The actual value would be somewhere in between 0.019 yr and 0.069 yr (e.g., if the Unit 1 EDG receives maintenance during half the time Unit 1 is not at power, then the unavailability of the Unit 1 EDG for Unit 2 would be $0.019 \text{ yr} + [0.5][0.05 \text{ yr}] = 0.044 \text{ yr}$).

Verify that the unavailabilities being assumed for shared structures, systems, or components in the Unit 2 probable risk assessment evaluation used for severe accident mitigation design alternatives (SAMDA) bound the expected unavailabilities once dual-unit operation has begun.

2. Clarification 3.a

The third issue raises the point of optimistically determined mission times for heat up calculations. In the last paragraph, TVA says that 24 hours was **generally** assumed. The facts and observations (F&O) proposed resolution is for TVA to make an explicit judgment of the adequacy of the assumptions and document this. Thus the issue is still open since those where 24 hours is not used may be optimistic and TVA has not specifically indicated that they have made the explicit judgment suggested. TVA notes, however, that the peer review concludes that this F&O is met.

Please clarify what is excluded by the term "generally" and provide a definitive statement that TVA has reviewed the analysis and finds it adequate.

Enclosure

3. Clarification 5.a

This response states that the same data blocks were used in the SEQSOR emulator as in the SEQSOR code, except where processes or equipment that needed to be considered in the Unit 2 analysis were not included in the NUREG-1150 analysis. Please confirm that the statement concerning data blocks means that the same data in the data blocks were used.

4. Clarification 5.b

The RAI responses submitted by letter dated January 31, 2011, include source terms (Table 2.a.iv-4) and other release characteristics (Table 2.a.iv-5) for the four release categories. We now understand that these were not used to calculate the consequences but rather, the consequences were calculated for the dominant release category types that make up each release category, with these results weighted by the contribution from each release category type to the release category itself. These weighted release category consequences for the four release categories were then used to determine the benefit of each SAMDA.

Please indicate (1) how the values in these tables were developed and, (2) if they were used, in what way? Please confirm that the above understanding is correct, verifying that the values in the tables were not used in the benefit calculations. The standard SAMDA Safety Evaluation usually cites the early release tables that give the release fractions, and we need to qualify their use. Also, the standard SAMDA Safety Evaluation normally cites the release characteristics (release fractions and other items) used in the Level 3 analysis and makes a statement as to their reasonableness. Provide the source terms and the consequence results for the 11 release characteristics that were combined to produce the consequences for the four release categories.

5. Clarification 15

For SAMDA 47 - enhance screen wash system - TVA states the benefit is less than 1.6 percent CDF. Please provide the basis for this, considering that the loss of component cooling water is a 10 percent contributor to CDF, while loss of emergency raw cooling water is a 6 percent contributor. As documented in an inspection report dated January 28, 2005 "Watts Bar NRC Integrated Inspection Report 05000390/2004005 and 05000391/2004005," Unit 1 had a series of debris and silting issues. While the screens themselves did not plug, some small lines after the screens were plugged.

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/RA/

Justin C. Poole, Project Manager
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