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

March 23, 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 FINAL SAFETY ANALYSIS REPORT AMENDMENT RELATED TO SECTIONS 9.2.1 AND 9.2.2 (TAC NO. ME4620)

Dear Mr. Bhatnagar:

By letter dated October 29, 2010 (Agencywide Documents Access and Management System Accession No. ML103160411), the Tennessee Valley Authority (TVA) submitted Amendment 101 to the Final Safety Analysis Report (FSAR) for Watts Bar Nuclear Plant, Unit 2.

The U.S. Nuclear Regulatory Commission staff has reviewed the information provided by TVA in FSAR Amendment 101 and finds that additional information is needed to complete its review regarding FSAR Sections 9.2.1, "Essential Raw Cooling Water System," and 9.2.2, "Component Cooling System." The specific questions are in the enclosed request for additional information.

A response is required within 15 days of receipt of this letter.

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 INFROMATION

WATTS BAR NUCLEAR PLANT (WBN), UNIT 2

FINAL SAFETY ANALYSIS REPORT (FSAR) AMENDMENT 101

SECTIONS 9.2.1 AND 9.2.2

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

Request for Additional Information (RAI)

1. Section 9.2.1, Essential Raw Cooling Water (ERCW) System

Background

In a letter dated December 10, 2010, Tennessee Valley Authority (TVA) provided the following:

(a) Enclosure 5, "Summary Heat Load and Flow Tables for RAI 9.2-ERCW-3." These tables show ERCW heat loads and flows for:

(1) LOOP (loss of offsite power) with loss of Train B and;

(2) LOOP with loss of Train A [1A & 2A]

It appears that the loss of Train A is the worst-case single failure because only component cooling system (CCS) heat exchanger (HX) "C" receives ERCW flow while CCS HX "A" and "B" do not receive ERCW flow.

(b) In its response to RAI 9.2-CCS-1, TVA stated that "Calculations demonstrate that there is sufficient Essential Raw Cooling Water (ERCW) and Component Cooling System capability to bring the non-accident unit to Cold Shutdown within 72 hours from entry into hot standby mode."

(c) In response to RAI 9.2 1-ERCW-3, TVA has stated that:

(1) In the case of Unit 1 in Hot Shutdown and Unit 2 with a loss-of-coolant accident (LOCA), there is an ERCW flow rate of 7600 gpm to CCS HX C. This results in the nonaccident (Hot Shutdown) unit entering Mode 5 (Cold Shutdown) 46 hours after shutdown. The cooldown analysis is based on maintaining the unit in Mode 3 (Hot Standby) for 18 hours, and then using the residual heat removal (RHR) system to cool the unit for 28 hours.

(2) In the case of Unit 1 with a LOCA and Unit 2 in Hot Shutdown, there is an ERCW flow rate of 7990 gpm to CCS HX C. This results in the nonaccident (Hot Shutdown) unit entering Mode 5 (Cold Shutdown) 36 hours after shutdown. The cooldown analysis is based on maintaining the unit in Mode 3 (Hot Standby) for 12 hours, and then using RHR to cool the unit for 24 hours.

(3) In response to RAI 9.2.1- ERCW-2, TVA stated that no operator action is required for ERCW header 1B backing up ERCW header 2A in supplying ERCW to CCS HXs A and B.

Questions:

(a) For (a)(1) above with LOCA (Unit 1) and Cold Shutdown (Unit 2), it appears that the ERCW is capable of removing 292,639 kBTU/hr, including the approximate 149,500 kBTU/hr removed by CCS HX A and B.

1. With this capability of ERCW for a LOOP and loss of Train B, explain the capability of the shared ERCW for WBN Units 1 and 2 to comply with General Design Criterion (GDC) 5, in that systems 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 cool down of the remaining unit.

2. What is the time to reach cold shutdown of the nonaccident unit? List major assumptions.

(b) For (a)(2) above with LOCA (Unit 1) and Cold Shutdown (Unit 2), it appears that the ERCW is capable of removing 271,860 kBTU/hr, including the approximate 128,729 kBTU/hr removed by CCS HX C.

1. With this capability of ERCW for a LOOP and loss of Train A, explain the capability of the shared ERCW for WBN 1 and 2 to comply with GDC 5 as described in (a) above.

2. What is the time to reach cold shutdown of the non accident unit? List major assumptions.

(c) The ERCW cooldown capabilities expressed in (c)(1) and (2) above with 7600 gpm and 7990 gpm of ERCW respectively, do not appear to correlate to any of the scenarios presented in Enclosure 5, "Summary Heat Load and Flow Tables for RAI 9.2-ERCW-3." Please explain.

(d) How do the calculations mentioned in (b) above relate to Enclosure 5, "Summary Heat Load and Flow Tables for RAI 9.2-ERCW-3" and the cool down times mentioned in (c) above.

(e) Explain (d) above because the flow diagram, Figure 9.2-2, apparently shows flow control valve 1-FCV-67-458 as a normally-closed valve.

(f) Describe any needed revisions to FSAR Section 9.2.1 to describe its design basis for adherence to GDC 5.

2. Section 9.2.2, Component Cooling System (CCS)

Background

In December 10, 2010, letter, TVA provided the following:

(a) Enclosure 3, "Summary Heat Load and Flow Tables for RAI 9.2-CCS-4". This table shows CCS heat loads and flows for:

(1) LOOP with loss of Train B

(2) LOOP with loss of Train A [1A and 2A]

It appears that the loss of Train A is the worst-case single failure with only CCS HX C available for Train B.

(b) Response to RAI 9.2-CCS-1 stated that "The project has performed calculations which demonstrate that there is sufficient Essential Raw Cooling Water (ERCW) and Component Cooling System capability to bring the non-accident unit to Cold Shutdown within 72 hours from entry into hot standby mode."

Questions:

(a) For (a)(1) above with LOCA (Unit 1) and Cold Shutdown (Unit 2), it appears that the CCS is capable of removing 56,220 kBTU/hr in CCS Train 1A and 93,230 kBTU/hr in CCS Train 2A.

1. With this capability of CCS for a LOOP and loss of Train B, explain the capability of the shared CCS for Watts Bar 1 and 2 to comply with GDC 5 in that systems 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 cool down of the remaining unit.

2. What is the time to reach cold shutdown of the nonaccident unit? List major assumptions.

(b) For (a)(2) above with LOCA (Unit 1) and Cold Shutdown (Unit 2), it appears that the CCS is capable of removing 55,162 kBTU/hr in CCS Train 1B and 73,567 kBTU/hr in CCS Train 2B.

1. With this capability of CCS for a LOOP and loss of Train A, explain the capability of the shared CCS for Watts Bar 1 and 2 to comply with GDC 5 as described in (a)(1) above.

2. What is the time to reach cold shutdown of the nonaccident unit? List the major assumptions.

(c) How do the calculations mentioned in b) above relate to Enclosure 3, "Summary Heat Load and Flow Tables for RAI 9.2-CCS-4."

(d) Describe any needed revisions to FSAR Section 9.2.2 to describe the design basis for adherence to GDC 5.

Mr. Ashok S. Bhatnagar
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Justin C. Poole, Project Manager
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