Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-153

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NFP-90
NRC Docket No. 50-390

Subject: **Watts Bar Nuclear Plant Unit 1 - Response to Request for Additional Information Related to Application to Revise Technical Specifications for Component Cooling Water and Essential Raw Cooling Water to Support Dual Unit Operation (TAC No. MF6376)**

References:
1. TVA Letter to NRC, "Watts Bar Nuclear Plant Unit 1 - Application to Revise Technical Specifications for Component Cooling Water and Essential Raw Cooling Water to Support Dual Unit Operation (TS-WBN-15-13)," dated June 17, 2015 [ADAMS Accession No. ML15170A474]
2. Email from NRC to TVA, "Watts Bar Unit 1 - Draft Requests for Additional Information re: Proposed CCS and ERCW TS to Support Dual Unit Operation (TAC No. MF6376)," dated July15, 2015

The purpose of this letter is to respond to a request for additional information (RAI) received from the Nuclear Regulatory Commission (NRC) concerning the Tennessee Valley Authority's June 17, 2015 application to revise certain technical specifications to support operation of both Watts Bar Nuclear Plant (WBN) Units 1 and 2 (Reference 1). The NRC request was received by email on July 15, 2015 (Reference 2).

Enclosure 1 to this letter provides the response to each of the RAI questions.

Additionally, in accordance with Title 10 of the *Code of Federal Regulations* (CFR) 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

This submittal contains one new regulatory commitment which is provided in Enclosure 2. Please contact Gordon Arent at 423-365-2004 if there are questions regarding this submittal.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st day of July 2015.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosures: 1. TVA Response to Request for Additional Information
2. Regulatory Commitment

cc (Enclosures):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant, Unit 1
NRC Senior Resident Inspector – Watts Bar Nuclear Plant, Unit 2
NRC Project Manager – Watts Bar Nuclear Plant, Unit 1
NRC Project Manager – Watts Bar Nuclear Plant, Unit 2
Director, Division of Radiological Health – Tennessee State Department of Environment and Conservation

ENCLOSURE 1

TVA Response to Request for Additional Information

NRC Request for Additional Information

As documented in NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplement 22, (SSER 22) published February 2011, the licensing basis of Watts Bar Nuclear Units is:

1. *Dual-unit trip as a result of an abnormal operational occurrence*
2. *Accident in one unit and concurrent shutdown of the second unit (with and without offsite power)*
3. *Accident in one unit and spurious engineered safety feature actuation in the other unit (with and without offsite power)*

The license amendment request (LAR) for Watts Bar Nuclear Plant (WBN) Unit 1, dated June 17, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15170A474) proposes realignment of Component Cooling System pumps and Essential Raw Cooling Water (ERCW) Pumps to support heat removal capability.

The staff is also reviewing a LAR submitted by letter dated August 1, 2013 (ADAMS Accession No. ML13220A103), to modify limiting conditions for operation for Technical Specification 3.8.1, "AC Sources - Operating," for the available maintenance feeder for Common Station Service Transformers (CSSTs) A and B.

The staff is requesting clarification on loading of onsite and offsite power systems and has determined that the following additional information is needed to complete the review of the LAR:

NRC Question 1

For the scenarios related to dual unit shutdown with offsite power system available, please provide a summary of the calculations performed to evaluate capability of offsite power transformers CSST A and B for the licensing basis documented in SSER 22. Provide the impact of changes proposed in the June 17, 2015, LAR on the licensing basis documented in SSER 22.

TVA Response

With offsite power available, there is no change to the licensing basis documented in SSER 22. Changes to the cases in the calculations for the dual unit shutdown with offsite power available were not revised in association with the June 17, 2015 LAR (Reference 1).

The offsite power analysis was performed assuming an accident on one unit and a spurious accident signal on the other unit. The loading in that scenario bounds the scenario for General Design Criteria (GDC) 5.

The spurious accident signal is assumed to occur with the unit in Mode 1. For this event the following large pumps are assumed to start on one 6.9 kV shutdown board:

- One Charging pump
- One Safety Injection pump
- One RHR pump
- One Containment Spray Pump
- Two CCS pumps (limiting case)
- One ERCW pump
- One motor driven AFW pump

For the case considered in the LAR, the following pumps would be loaded on a single 6.9 kV shutdown board on the non-accident unit.

- One Charging pump
- One RHR pump
- Two CCS pumps
- Two ERCW pumps

As can be seen in Table 2 of the LAR, the SI pump, Containment Spray pump, and AFW pump combined horsepower is approximately 1660 horsepower. This is approximately twice the horsepower requirement of an ERCW pump. Since these three pumps are not running for the GDC-5 case, there is considerable margin compared to the limiting case thus demonstrating that the start of a second ERCW pump on a non-accident shutdown board is acceptable and bounded by the LOCA/inadvertent SI case.

The evaluations of CSSTs A and B are included in the WBN calculation EDQ00099920070002, "AC Auxiliary Power System Analysis" (Reference 2). TVA submitted a response to NRC Open Items from SSER 22 on April 6, 2011 for WBN Unit 2 (Reference 3). This submittal described the margin studies done for all four CSST's. The margin studies that TVA provided in Reference 3 were discussed in SSER 24 in relation to the closure of SSER Open Items 27 and 28. Because the LOCA on one unit with an inadvertent SI on the other unit results in a higher load than the scenario discussed in the LAR, additional margin studies were not required.

NRC Question 2

Table 3 in Enclosure 1 of the WBN Unit 1, LAR dated June 17, 2015, contains the Summary of Steady-State Diesel Generator (DG) Loading with 3 ERCW Pumps (>20 minutes) only.

Please clarify whether the electrical system loadings considered in Table 3 of the LAR is bounding for all the scenarios without offsite power addressed in SSER 22 summarized above. For the scenarios related to shutdown using onsite power systems, please provide details (calculations or explanation) related to large motor loads (Rating and horse power value) considered for the specific scenarios. Provide details of additional kilo-Watt (kW) loading considered in the total kW loading of each DG. Also provide DG loadings during = 20 minutes.

TVA Response

The DG loading for the first 20 minutes is the base case loading described in the WBN Calculation EDQ00099920080014, "Diesel Generator Loading Analysis" (Reference 4). The CCS pumps are assumed to start and run in the base case, so the proposed amendment related to CCS does not represent a change from an electrical standpoint. The loading of a second ERCW pump on an individual DG occurs no earlier than 40 minutes after DG start. This is why the base case applies for the first 20 minutes.

Table 3 represents the bounding cases after 20 minutes. The values in the table provide the horsepower assumed for each of the large motor loads for each available DG and provide the total kW loading on each available DG for the scenarios in Table 3. The base case loadings were provided in a letter from TVA to NRC dated June 7, 2012 (Reference 5). Attachment 1 of that letter provided excerpts from the DG loading calculation including tables that summarized the loads on each DG for a variety of cases including Loss of Offsite Power (LOOP)/Loss of Coolant Accident (LOCA) and dual unit cases.

NRC Question 3

Please provide details on any load shedding that may be procedurally controlled to preclude overloading the power source(s).

TVA Response

Before a second ERCW pump can be loaded on its DG, the Auxiliary Feedwater (AFW) Pump, if running, will be stopped and the main control room hand switch placed in pull-to-lock. This action assures that the AFW pump will not inadvertently start to preclude overloading the DG. TVA currently plans to include these actions in the same procedure that starts the second ERCW pump. The actions will be placed in a step that precedes the start of the second ERCW pump. This is the only load shed assumed in the DG loading analysis.

ENCLOSURE 1

TVA Response to Request for Additional Information

References

1. TVA Letter to NRC, "Watts Bar Nuclear Plant Unit 1 - Application to Revise Technical Specifications for Component Cooling Water and Essential Raw Cooling Water to Support Dual Unit Operation (TS-WBN-15-13)," dated June 17, 2015

2. TVA Calculation EDQ00099920070002, "AC Auxiliary Power System Analysis"

3. TVA Letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) - Response to NRC Required Action Items," dated April 6, 2011

4. TVA Calculation EDQ00099920080014, "Diesel Generator Loading Analysis"

5. TVA Letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 – NUREG-0847 Supplemental Safety Evaluation Report (SSER) Related to the Operation of Watts Bar Nuclear Plant, Unit 2, Appendix HH Open Item 26 - Diesel Generator Response (TAC No. ME0853)," dated June 7, 2012

ENCLOSURE 2

Regulatory Commitment

TVA will include a procedural action to place an Auxiliary Feedwater pump in pull-to-lock prior to starting a second ERCW pump on a shutdown board when the shutdown board is powered by the diesel generators.