



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

CNL-16-142

September 23, 2016

10 CFR 50.90

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

Watts Bar Nuclear Plant, Units 1 and 2  
Facility Operating License Nos. NPF-90 and NPF-96  
NRC Docket Nos. 50-390, and 50-391

Subject: **Application to Modify Operating License Conditions for Watts Bar Nuclear Plant, Units 1 and 2 Regarding the Completion of Permanent Modifications to the Fort Loudoun Dam (WBN-TS-16-12)**

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is submitting a request for an amendment to Facility Operating License Nos., NPF-90 and NPF-96 for Watts Bar Nuclear Plant (WBN) Unit 1 and Unit 2, respectively.

Tennessee Department of Transportation (TDOT) is currently constructing a new highway U.S. 321 bridge across the Tennessee River to reroute traffic away from the Fort Loudoun Dam. The TDOT project also closes the approach roads to Fort Loudoun Dam which will no longer be used for vehicular traffic. The rerouting of traffic eliminates the need to alter or block traffic flow to accommodate modifications to the Fort Loudoun Dam. The completion of the TDOT project has been delayed until August 11, 2017.

This license amendment proposes to revise the completion date for License Condition 2.C(9)b for WBN Unit 1 and License Condition 2.C(3) for WBN Unit 2 regarding the completion of permanent modifications to the Fort Loudoun Dam from February 1, 2017 to June 30, 2018, to accommodate the current TDOT schedule.

The enclosure to this letter provides a description of the proposed changes, technical evaluation of the proposed changes, regulatory evaluation, and a discussion of environmental considerations. Attachments 1 and 2 to the enclosure provide the existing Operating License pages marked-up to show the proposed changes. Attachments 3 and 4 to the enclosure provide the proposed Operating License pages retyped to show the changes incorporated.

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The WBN Plant Operations Review Committee and the TVA Nuclear Safety Review Board have reviewed this proposed change and determined that operation of WBN Units 1 and 2 in accordance with the proposed change will not endanger the health and safety of the public.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the license change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Division of Radiological Health - Tennessee State Department of Environment and Conservation.

TVA requests approval of this proposed license amendment by January 15, 2017, with implementation within 15 days following the Nuclear Regulatory Commission approval.

There are no new regulatory commitments associated with this submittal. Please address any questions regarding this request to Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 23rd day of September 2016.

Respectfully,



J. W. Shea  
Vice President, Nuclear Licensing

Enclosure: Evaluation of Proposed Change

cc: See Page 3

cc (Enclosure):

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

ENCLOSURE

ATTACHMENT 1

Proposed Operating License Changes (Mark-Ups) for WBN Unit 1

**ENCLOSURE**  
**Tennessee Valley Authority**  
**Watts Bar Nuclear Plant, Units 1 and Unit 2**

**WBN-TS-16-12**

**EVALUATION OF PROPOSED CHANGE**

**Subject: Application to Modify Operating License Conditions for Watts Bar Nuclear Plant, Units 1 and 2 Regarding the Completion of Permanent Modifications to the Fort Loudoun Dam (WBN-TS-16-12)**

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**ATTACHMENTS**

1. Proposed Operating License Change (Mark-Ups) for WBN Unit 1
2. Proposed Operating License Change (Mark-Ups) for WBN Unit 2
3. Proposed Operating License Change (Final Typed) for WBN Unit 1
4. Proposed Operating License Change (Final Typed) for WBN Unit 2
5. Schedule Change Letter from Tennessee Department of Transportation
6. Tennessee Department of Transportation Project Traffic Route

## ENCLOSURE

### 1.0 SUMMARY DESCRIPTION

Tennessee Valley Authority (TVA) is requesting a license amendment to revise the completion date for License Condition 2.C(9)b for WBN Unit 1 and License Condition 2.C(3) for WBN Unit 2 regarding the completion of permanent modifications to the Fort Loudoun Dam from February 1, 2017 to June 30, 2018.

### 2.0 Detailed Description

License Condition 2.C(9)b for WBN, Unit 1 currently states:

*“TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by February 1, 2017.”*

The proposed change will revise License Condition 2.C(9)b for WBN, Unit 1 to state:

*“TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by June 30, 2018.”*

License Condition 2.C(3) for WBN, Unit 2 currently states:

*“TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by February 1, 2017.”*

The proposed change will revise License Condition 2.C(3) for WBN, Unit 2 to state:

*“TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by June 30, 2018.”*

### 3.0 Technical Evaluation

In order to complete the planned modifications to Fort Loudoun Dam, closure of traffic on highway U.S. 321 is required because approximately 1900 feet of the 4500 feet planned for modification is located directly adjacent to the highway. Closure of highway U.S. 321 to facilitate dam modifications would significantly affect emergency service response and disrupt commercial and residential traffic. A complete shutdown of highway U.S. 321 during dam modification would require a detour in excess of 50 miles for the emergency service response vehicles and commercial/residential traffic that normally use highway U.S. 321.

Tennessee Department of Transportation (TDOT) is currently constructing a new highway U.S. 321 bridge across the Tennessee River to reroute traffic away from the Fort Loudoun Dam. The TDOT project also closes the approach roads to Fort Loudoun Dam which will no longer be used for vehicular traffic. The rerouting of traffic eliminates the need to alter or block traffic flow to accommodate modifications to the Fort Loudoun Dam. The estimated completion date for the TDOT project has been delayed until August 11, 2017 (Attachment 5). Upon completion of the new Highway 321 bridge and subsequent rerouting of vehicular traffic away from the Fort Loudoun Dam (Attachment 6), TVA will complete the required modifications to the remaining 1900 feet of the Fort Loudoun Dam by June 30, 2018.

## ENCLOSURE

The NRC approved License Condition 2.C(9)b for WBN Unit 1 in Reference 1 and 2.C(3) for WBN Unit 2 in Reference 2. In approving these license conditions, the NRC stated that TVA's proposal was acceptable because:

(1) the existing HESCO barriers will continue to function to prevent overtopping the embankment,

(2) TVA will continue to maintain the HESCO barriers to extend the barrier life and conduct inspections until the permanent modifications are completed, and

(3) TVA had re-performed the hydrological analysis under seismic scenarios without crediting the sand baskets to increase the height of the Fort Loudoun embankment for the seismic scenarios. TVA concluded that the resultant flood level at WBN still did not exceed the proposed Design Basis Flood level.

TVA has concluded that the change in the completion date does not affect the basis of the NRC approval.

### 4.0 REGULATORY EVALUATION

#### 4.1 Applicable Regulatory Requirements/Criteria

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 100, requires identifying and evaluating hydrologic features of the site.

10 CFR 100.23(d) sets forth the criteria to determine the siting factors for plant design bases with respect to seismically induced floods and water waves at the site.

10 CFR 50, Appendix A, General Design Criteria (GDC) 2, requires consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

The requirements of the proposed changes conform to the above regulatory requirements.

## ENCLOSURE

### 4.2 SIGNIFICANT HAZARDS CONSIDERATION

This license amendment proposes to revise the completion date for License Condition 2.C(9)b for WBN Unit 1 and License Condition 2.C(3) for WBN Unit 2 regarding the completion of permanent modifications to the Fort Loudoun Dam from February 1, 2017 to June 30, 2018.

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes to revise the completion date for License Condition 2.C(9)b for WBN Unit 1 and License Condition 2.C(3) for WBN Unit 2 regarding the completion of permanent modifications to the Fort Loudoun Dam from February 1, 2017 to June 30, 2018 do not affect the structures, systems, or components (SSCs) of the plant, affect plant operations, or any design function or an analysis that verifies the capability of an SSC to perform a design function. No change is being made to any of the previously evaluated accidents in the WBN Updated Final Safety Analysis Report (UFSAR).

The proposed changes do not 1) require physical changes to plant SSCs; 2) prevent the safety function of any safety-related system, structure, or component during a design basis event; 3) alter, degrade, or prevent action described or assumed in any accident described in the WBN UFSAR from being performed because the safety-related SSCs are not modified; 4) alter any assumptions previously made in evaluating radiological consequences; or 5) affect the integrity of any fission product barrier.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes do not introduce any new accident causal mechanisms, because no physical changes are being made to the plant, nor do they affect any plant systems that are potential accident initiators.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

## ENCLOSURE

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The margin of safety associated with the acceptance criteria of any accident is unchanged. The proposed changes will have no effect on the availability, operability, or performance of safety-related systems and components. The proposed change will not adversely affect the operation of plant equipment or the function of equipment assumed in the accident analysis.

The proposed amendment does not involve changes to any safety analyses assumptions, safety limits, or limiting safety system settings. The changes do not adversely affect plant-operating margins or the reliability of equipment credited in the safety analyses.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92 (c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 4.3 CONCLUSIONS

In conclusion, based on the considerations discussed above, there is reasonable assurance that (1) the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

### 5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.



## ENCLOSURE

### 6.0 REFERENCES

1. Watts Bar Nuclear Plant, Unit 1 - Issuance of Amendment To Revise Updated Final Safety Analysis Report Regarding Changes to Hydrology Analysis By letter dated January 28, 2015 (ADAMS Accession No. ML15005A314)
2. NUREG-0847, Supplement 29, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," issued October 2015

- (8) Upon implementation of Amendment No. 70 adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air in-leakage as required by SR 3.7.10.4, in accordance with TS 5.7.2.20.c(i), the assessment of CRE habitability as required by Specification 5.7.2.20.c(ii), and the measurement of CRE pressure as required by Specification 5.7.2.20.d, shall be considered met following implementation:
- (a) The first performance of SR 3.7.10.4, in accordance with Specification 5.7.2.20.c(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from April 5, 2004, the date of the most recent successful tracer gas test, as stated in the August 4, 2004, letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
  - (b) The first performance of periodic assessment of CRE habitability, Specification 5.7.2.20.c(ii) shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from April 5, 2004, the date of the most recent successful tracer gas test, as stated in the August 4, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
  - (c) The first performance of the periodic measurement of CRE pressure, Specification 5.7.2.20.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from May 10, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.
- (9) Permanent Dam Modification
- (a) The Tennessee Valley Authority (TVA) will take actions to ensure the stability of the Tellico Dam. Watts Bar Dam, Watts Bar West Saddle Dike, Fort Loudoun Dam. Cherokee Dam. Douglas Dam. and the required Douglas Saddle Dams under nuclear probable maximum flood conditions, consistent with TVA's River Operations acceptance criteria. These actions shall be completed prior to implementing the revised hydrologic analysis for the WBN site, including changes to the hydraulic analysis methodology and updates to the TVA River Operations dam stability acceptance criteria by May 31, 2015.
  - (b) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by ~~February 1, 2017~~ **June 30, 2018**.

ENCLOSURE

ATTACHMENT 2

Proposed Operating License Changes (Mark-Ups) for WBN Unit 2

C. The license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act, and to the rules regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.

(1) Maximum Power Level

TVA is authorized to operate the facility at reactor core power levels not in excess of 3411 megawatts thermal.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 1, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudon Dam due to the Probable Maximum Flood by ~~February 1, 2017~~ **June 30, 2018**.

(4) PAD4TCD may be used to establish core operating limits for Cycles 1 and 2 only. PAD4TCD may not be used to establish core operating limits for subsequent reload cores.

(5) By December 31, 2017, the licensee shall report to the NRC that the actions to resolve the issues identified in Bulletin 2012-01, "Design Vulnerability in Electrical Power System," have been implemented.

(6) The licensee shall maintain in effect the provisions of the physical security plan, security personnel training and qualification plan, and safeguards contingency plan, and all amendments made pursuant to the authority of 10 CFR 50.90 and 50.54(p).

(7) TVA shall fully implement and maintain in effect all provisions of the Commission approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The TVA approved CSP was discussed in NUREG-0847, Supplement 28.

(8) TVA shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Report for the facility, as described in NUREG-0847, Supplement 29, subject to the following provision:

ENCLOSURE

ATTACHMENT 3

Proposed Operating License Changes (Final Typed) for WBN Unit 1

- (8) Upon implementation of Amendment No. 70 adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air in-leakage as required by SR 3.7.10.4, in accordance with TS 5.7.2.20.c(i), the assessment of CRE habitability as required by Specification 5.7.2.20.c(ii), and the measurement of CRE pressure as required by Specification 5.7.2.20.d, shall be considered met following implementation:
- (a) The first performance of SR 3.7.10.4, in accordance with Specification 5.7.2.20.c(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from April 5, 2004, the date of the most recent successful tracer gas test, as stated in the August 4, 2004, letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
  - (b) The first performance of periodic assessment of CRE habitability, Specification 5.7.2.20.c(ii) shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from April 5, 2004, the date of the most recent successful tracer gas test, as stated in the August 4, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
  - (c) The first performance of the periodic measurement of CRE pressure, Specification 5.7.2.20.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from May 10, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.
- (9) Permanent Dam Modification
- (a) The Tennessee Valley Authority (TVA) will take actions to ensure the stability of the Tellico Dam. Watts Bar Dam, Watts Bar West Saddle Dike, Fort Loudoun Dam. Cherokee Dam. Douglas Dam. and the required Douglas Saddle Dams under nuclear probable maximum flood conditions, consistent with TVA's River Operations acceptance criteria. These actions shall be completed prior to implementing the revised hydrologic analysis for the WBN site, including changes to the hydraulic analysis methodology and updates to the TVA River Operations dam stability acceptance criteria by May 31, 2015.
  - (b) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudoun Dam due to the Probable Maximum Flood by June 30, 2018.

ENCLOSURE

ATTACHMENT 4

Proposed Operating License Changes (Final Typed) for WBN Unit 2

C. The license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act, and to the rules regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.

(1) Maximum Power Level

TVA is authorized to operate the facility at reactor core power levels not in excess of 3411 megawatts thermal.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 1, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudon Dam due to the Probable Maximum Flood by June 30, 2018.

(4) PAD4TCD may be used to establish core operating limits for Cycles 1 and 2 only. PAD4TCD may not be used to establish core operating limits for subsequent reload cores.

(5) By December 31, 2017, the licensee shall report to the NRC that the actions to resolve the issues identified in Bulletin 2012-01, "Design Vulnerability in Electrical Power System," have been implemented.

(6) The licensee shall maintain in effect the provisions of the physical security plan, security personnel training and qualification plan, and safeguards contingency plan, and all amendments made pursuant to the authority of 10 CFR 50.90 and 50.54(p).

(7) TVA shall fully implement and maintain in effect all provisions of the Commission approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The TVA approved CSP was discussed in NUREG-0847, Supplement 28.

(8) TVA shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Report for the facility, as described in NUREG-0847, Supplement 29, subject to the following provision:



ENCLOSURE

ATTACHMENT 5

Schedule Change Letter from Tennessee Department of Transportation



**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION**

**DISTRICT 19 OPERATIONS – UNIT 1902**  
2841 GENERAL CARL STINER HIGHWAY  
LAFOLLETTE, TENNESSEE 37766  
(423) 566-9631

**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

May 4, 2016

Ms. Lawanda Hayes  
Sr. Project Manager  
Tennessee Valley Authority  
Civil Projects  
1101 Market Street  
BR 2S 412  
Chattanooga, TN 37402

**RE: TDOT Project CNL139, Loudon County, SR 73 (US 321) at the Fort Loudon Dam**

Dear Ms. Hayes,

Pursuant to your request in the email dated Friday, April 22, 2016, I offer the following information:

The most current CPM schedule submitted by the contractor shows the completion date of the project being August 11, 2017, and the completion of the removal of the bridge on the dam as July 31, 2017.

I have provided the information as correctly as we know it to be, based on the contractor's CPM schedule.

The contractor is required to submit an updated CPM schedule on a monthly basis, and I will notify you if these dates change.

I hope this correspondence will be helpful as you move forward with your important project.

Respectfully submitted,

Clint Bane  
TDOT Operations District Manager – District 19  
2841 General Carl W. Stiner Highway  
LaFollette, TN 37766



ENCLOSURE

ATTACHMENT 6

Tennessee Department of Transportation Project Traffic Route

