



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

CNL-15-149

August 13, 2015

10 CFR 50.90

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

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

Subject: **Application to Update Watts Bar Nuclear Plant Unit 1 License
Condition 2.F to Allow Two-Unit Operation and Add License Condition
2.I (WBN-TS-15-01)**

Reference: Letter from TVA to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Transmittal
of Unit 1/Unit 2 As-Constructed Fire Protection Report (TAC No. ME3091)," dated June 24, 2015 (ADAMS Accession No. ML15175A508)

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is submitting a license amendment request (LAR) for Facility Operating License (OL) No. NPF-90 for Watts Bar Nuclear Plant (WBN) Unit 1. This LAR proposes to modify Section 2.F (i.e., License Condition 2.F) of the WBN Unit 1 OL and add a new License Condition 2.I. License Condition 2.F is modified to reflect a revised two-unit operation Fire Protection Program that will be in effect after WBN Unit 2 receives an operating license. The revised WBN Unit 1/Unit 2 As-Constructed Fire Protection Report that describes the WBN two-unit Fire Protection Program was submitted for Nuclear Regulatory Commission (NRC) approval by TVA letter dated June 24, 2015 (Reference). License Condition 2.I is added to provide time for TVA to further ensure the fire detection monitoring panel in the main control room (MCR) meets the appropriate designated standards or is tested and found suitable for the specified purpose.

Each enclosure to this letter provides a description, technical evaluation, regulatory evaluation, and discussion of environmental considerations for the proposed change. Attachment 1 to the enclosures provides a mark-up of the proposed change to the OL. Attachment 2 to the enclosures provides the proposed OL page retyped to show the change.

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By letter dated August 12, 2015, TVA submitted a letter stating that the construction of WBN Unit 2 is substantially complete. Based on this, TVA requests that this proposed amendment be approved by October 18, 2015. The implementation of the proposed license amendment should be no later than 60 days after issuance of the license amendment.

TVA has determined that there are no significant hazards considerations associated with the proposed changes and that the changes qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

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

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

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of August 2015.

Respectfully,



J. W. Shea
Vice President, Nuclear Licensing

Enclosures:

1. Evaluation of Proposed Change to License Condition 2.F
2. Evaluation of Proposed Addition of License Condition 2.I

cc (Enclosures):

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

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT UNIT 1

EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

Subject: Application to Update Watts Bar Nuclear Plant Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-15-01)

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EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

Application to Update Watts Bar Nuclear Plant Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-15-01)

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Watts Bar Nuclear Plant (WBN) Unit 1, Facility Operating License (OL) No. NPF-90. The proposed change will revise Section 2.F (i.e., License Condition 2.F) of the WBN Unit 1 OL. Section 2.F is the license condition associated with Fire Protection and defines the basis for the Nuclear Regulatory Commission's (NRC's) approval of the Fire Protection Program that is applicable for the operation of WBN Unit 1. Tennessee Valley Authority (TVA) is currently in the process of completing the construction of WBN Unit 2. Section 2.F is being updated to reflect two-unit operation and the Fire Protection Program that will be in effect after WBN Unit 2 receives an operating license.

By letter dated August 12, 2015, TVA submitted a letter stating that the construction of WBN Unit 2 is substantially complete. Based on this, TVA requests that this proposed amendment be approved by October 18, 2015. The implementation of the proposed license amendment should be no later than 60 days after issuance of the license amendment.

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

Currently, WBN Unit 1, License Condition 2.F states:

"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 approved in Supplement 18 (except page 80 of Appendix FF), revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88 and Supplement 19 of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire."

A request to amend License Condition 2.F was previously submitted via TVA's letter dated December 20, 2013 (Reference 1). After a meeting with the NRC on January 28, 2014 (Reference 2) to discuss the information submitted in Reference 1, it was determined that TVA would withdraw the amendment request. A withdrawal request was submitted by TVA in a letter dated February 18, 2014 (Reference 3). By letter dated April 7, 2014 (Reference 4), the NRC accepted the withdrawal of the amendment request. TVA submitted updated versions of the as-constructed WBN Unit 1/Unit 2 FPR on September 18, 2014 (Reference 12), January 9, 2015 (Reference 5) and on June 24, 2015 (Reference 6).

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EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

Application to Update Watts Bar Nuclear Plant Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-15-01)

As stated previously, TVA met with the NRC on January 28, 2014 (Reference 2). During the meeting, TVA and NRC agreed on the importance of having a clear basis for establishing which of the NRC's approvals of the WBN Fire Protection Program [i.e., Supplemental Safety Evaluation Reports (SSERs)] applied to WBN Unit 1 going forward and which NRC approvals applied to WBN Unit 2. This clarity would be important to support TVA's ability to comply with the regulatory requirements and approvals specific to the design of the respective units. Based on the January 28, 2014 meeting and subsequent meetings and discussions, TVA understands that only Section 3.5, "Manual Operator Actions," of SSER No. 18 will remain applicable to WBN Unit 1 after the NRC completes its review of the WBN Unit 1/Unit 2 FPR. Based on this determination, NUREG-0847, SSER No. 19 will no longer apply to the WBN Unit 1 Fire Protection licensing basis.

The NRC review of the as-designed WBN Unit 1/Unit 2 FPR is documented in Appendix FF, "Fire Protection Program Safety Evaluation," of NUREG-0847 SSER No. 26 (Reference 8). Additional NRC review of the as-constructed two-unit FPR will be documented in a future SSER. Considering this, the wording of the proposed license condition is dependent on the SSER(s) approved at the time WBN Unit 2 is licensed. Therefore, the wording of the license condition will include references to multiple SSERs. The proposed license condition below is consistent with the standard license condition defined in Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements" (Reference 7):

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 approved in **Section 3.5 of Supplement 18** ~~(except page 80 of Appendix FF)~~, **revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88** and Supplement ~~19-XX~~ of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

2.2 Need for Proposed Changes

In June of 1982, the NRC staff issued safety evaluation report (SER), NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2" (Reference 8) regarding TVA's application for licenses to operate WBN Units 1 and 2. In SSER Nos. 1 through 20, the NRC staff concluded that WBN Unit 1, met all applicable regulations and regulatory guidance, and on February 7, 1996, the NRC issued an OL for WBN Unit 1 (Reference 9). The OL for WBN Unit 1 included License Condition 2.F that was based on GL 86-10. The license condition documented that NRC's approval of the Fire Protection Program for the operation of WBN Unit 1 as

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EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

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contained in SSER No. 18 and SSER No. 19. Appendix FF of SSER Nos. 18 and 19 documented the NRC's review of the FPR developed for single unit operation.

At the time WBN Unit 1 received an OL, the completion of WBN Unit 2 had been deferred. On March 4, 2009 (Reference 10), TVA submitted an updated application in support of a request for an OL for WBN Unit 2. Since that time, construction activities for WBN Unit 2 have continued and a WBN Unit 1/Unit 2 FPR was developed to replace the FPR that is currently applicable to WBN Unit 1.

As stated previously, the proposed amendment revises License Condition 2.F to reflect two-unit operation and the Fire Protection Program that will be in effect after WBN Unit 2 receives an operating license. The updated Fire Protection Program is documented in the WBN Unit 1/Unit 2 FPR that will replace the current WBN Unit 1 FPR. The NRC's review of the as-designed version of the WBN Unit 1/Unit 2 FPR is documented in SSER No. 26. As-constructed versions of the WBN Unit 1/Unit 2 FPR were submitted to NRC on September 18, 2014 (Reference 12), January 9, 2015 (Reference 5) and on June 24, 2015 (Reference 6). If the need arises to revise the WBN Unit 1/Unit 2 FPR prior to WBN Unit 2 receiving an operating license, it is anticipated that the NRC will document their review of the changes in a future SSER.

2.3 Implementation

The TVA process governing the preparation and submittal of Technical Specification (TS) changes and License Amendment Requests requires that the appropriate organizations (e.g., Operations, Training, Engineering, Maintenance, Chemistry, Radiation Protection, and Work Control) identify the documents that are affected by each proposed change to the TSs and Operating Licenses. Among the items that are considered are training, plant modifications, procedures, special implementation constraints, design documents, surveillance instructions associated with TS Surveillance Requirements, Technical Requirements Manual, TS Bases, and Updated Final Safety Analysis Report (UFSAR). The process requires that procedures and design document changes necessary to support TS Operability are approved prior to implementation of an NRC approved license amendment. The process also provides assurance that the remaining changes, if any, are scheduled and tracked for configuration control.

3.0 TECHNICAL EVALUATION

The principal systems included in WBN's Fire Protection System are listed below:

1. System 13, "Fire Detection System"
2. System 26, "High Pressure Fire Protection"
3. System 39, "CO2 Storage, Fire Protection, & Purging System"

For the licensing of WBN Unit 1, System 39 and the majority of System 13 and System 26 were placed in service. Most of the physical attributes of Systems 13, 26, and 39, were reviewed and approved by the NRC as documented in SSER Nos. 18 and 19 (Reference 8). In addition to the portions of the systems available for WBN Unit 1

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operation, limited portions of Systems 13 and 26, primarily in the WBN Unit 2 Reactor Building, will be placed in service for WBN Unit 2 operation. An as-designed WBN Unit 1/Unit 2 FPR was submitted to the NRC on March 13, 2013 (Reference 11), describing the equipment required for two-unit operation. The information provided in Reference 11 was updated in the as-constructed version of the WBN Unit 1/Unit 2 FPR (Reference 12). The NRC documented its assessment of the as-designed WBN Unit 1/Unit 2 FPR in SSER No. 26 (Reference 8). As the construction and testing of WBN Unit 2 progressed toward completion, TVA initiated a recovery project to address identified engineering design basis gaps. Changes were identified and made to the WBN Unit 1/Unit 2 FPR as submitted in Reference 6. The NRC is reviewing this FPR submittal. TVA and the NRC staff will ensure the WBN Unit 1 and WBN Unit 2 Operating Licenses and associated Fire Protection license condition reflect all SSERs applicable to the WBN Unit 1/Unit 2 FPR.

The technical aspects of the as-designed WBN Unit 1/Unit 2 FPR were evaluated by the NRC in SSER No. 26, and NRC's review of the as-constructed WBN Unit 1/Unit 2 FPR will be documented in a future SSER. The change proposed in this amendment request does not affect the design basis or operational controls related to the Fire Protection System. The approval of the proposed change will make the WBN Unit 1/Unit 2 FPR applicable to WBN Unit 1 through the references to the applicable SSERs in the license condition.

The proposed change is limited in scope and will align the OLs for WBN Unit 1 and Unit 2, so that the Fire Protection Program may be managed by a common document (i.e., the WBN Unit 1/Unit 2 FPR). Because this proposed change is administrative in nature, no accident analysis conclusions made in the WBN Unit 1 UFSAR are affected. The WBN Unit 1 FPR is incorporated by reference in Section 9.5.1, "Fire Protection System," of the WBN Unit 1 UFSAR.

Based on the preceding, WBN's Fire Protection Program is being structured for two-unit operation. To accomplish this, the NRC has reviewed the as-designed WBN Unit 1/Unit 2 FPR and its conclusions are documented in SSER No. 26. NRC's review of the as-constructed FPR will be documented in a future SSER. This proposed amendment request will update the operating license for WBN Unit 1 to support two-unit operation in accordance with the WBN Unit 1/Unit 2 FPR.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

General Design Criterion (GDC) 3, "Fire Protection," of Appendix A to 10 CFR 50 requires that structures, systems, and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. 10 CFR 50.48 requires that each operating nuclear power plant have a fire protection plan that satisfies GDC 3. It specifies what should be contained in such a plan and lists the basic fire protection guidelines for the plan. For WBN Unit 1, the plan that satisfies these requirements is the WBN Unit 1 FPR.

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During the development of the WBN Unit 1 FPR, TVA utilized the guidance provided in Generic Letter (GL) 88-12, "Removal of Fire Protection Requirements from Technical Specifications," (Reference 13) for the development of the Operating Requirements defined in Part II of the WBN Unit 1 FPR. It should be noted that WBN Unit 1, was not licensed to operate at the time the FPR was initially developed and did not have an approved set of plant specific Technical Specifications. Therefore, the WBN Unit 1 FPR Operating Requirements were developed based on NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors" (Reference 14) and industry experience, not the NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," based TSs issued with the WBN Unit 1 OL.

GL 88-12 also addresses the guidance provided in GL 86-10 and the adoption of the standard license condition specified in Enclosure 3 of GL 86-10. The license condition being revised by this proposed amendment (i.e., License Condition 2.F) is based on the standard license condition provided in Enclosure 3 of GL 86-10. GL 86-10 included a series of questions and answers. Question 8.4, "Future Changes," clarifies that changes to the fire protection license condition would require the submittal of a license amendment request (LAR) to the NRC. This LAR satisfies that guidance.

Additional guidance regarding changes to the fire protection license condition is provided in the following discussion from Section 2.4.1, "Fire Protection Program Changes, Review and Approval," of SSER No. 18 (Reference 8):

"The applicant has elected to follow the guidance of Generic Letter 88-12 and incorporate the standard fire protection license condition. In addition to including, by reference, the NRC safety evaluation which approved the plant fire protection program, this license condition allows the applicant to make changes to the approved program without prior approval of the Commission if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

The applicant may change the approved fire protection program provided (1) the change or changes do not otherwise result in a change to the license condition or plant TSs result in an unreviewed safety question, and (2) the change or changes do not result in failure to complete the fire protection program as approved by the Commission..."

In addition to the above, Part II of the WBN Unit 1 FPR contains a set of references that includes the following regulatory documents:

1. Branch Technical Position (Auxiliary Power and Control Systems Branch) 9.5-1, Appendix A
2. 10 CFR 50 Appendix R - Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979

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3. NRC letter dated August 29, 1977 - Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance
4. Generic Letter 81-12 - Fire Protection Rule and NRC Memorandum of Clarification for Generic Letter 81-12, dated March 22, 1982
5. Generic Letter 82-21 - Technical Specifications for Fire Protection Audits
6. Generic Letter 83-33 - NRC Positions on Certain Requirements of Appendix R to 10 CFR 50.
7. Generic Letter 86-10 - Supplement 1 - Fire Endurance Acceptance Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Trains within the Same Fire Area

With the implementation of the proposed change, WBN Unit 1 will continue to meet the applicable regulations and requirements listed above.

4.2 Precedent

TVA has identified no suitable precedent where the fire protection license condition for an operating unit was being updated to address the licensing of a second unit.

4.3 Significant Hazards Consideration

The proposed change will revise Section 2.F (i.e., License Condition 2.F) of the Watts Bar Nuclear Plant (WBN) Unit 1 Facility Operating License (OL). Section 2.F is the license condition associated with fire protection and defines the basis for the NRC's approval of the Fire Protection Program that is applicable for the operation of WBN Unit 1. TVA is currently in the process of completing the construction of WBN Unit 2. License Condition 2.F is being updated to reflect two-unit operation and the Fire Protection Program that will be in effect after WBN Unit 2 receives an operating license.

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment 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 overall effect of the licensing of WBN Unit 2, on the safe operation of WBN Unit 1, is being assessed by the reviews the Nuclear Regulatory Commission (NRC) documents in Supplemental Safety Evaluation Reports (SSERs). This proposed change is limited in scope and will align the OLs for

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WBN Unit 1 and WBN Unit 2, so that the Fire Protection Program may be managed by a common document, the WBN Unit 1/Unit 2 Fire Protection Report (FPR). Because this proposed change is administrative in nature, no accident analysis conclusions made in the WBN Unit 1 UFSAR are affected. The proposed change revised the WBN Fire Hazards Analysis (FHA) but did not result in any adverse effects or any adverse effects on any component required for a fire safe shutdown.

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 overall effect of the licensing of WBN Unit 2, on the safe operation of WBN Unit 1, is being assessed by the reviews the NRC documents in SSERs. This proposed change is limited in scope and does not result in any adverse effects on the FHA or any component required for a fire safe shutdown. In addition, no accident analysis conclusions made in the WBN Unit 1 UFSAR are affected. Based on this, the proposed amendment will not alter the requirements or function for systems required during accident conditions.

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

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

Response: No.

This proposed change is associated with the implementation of WBN's Fire Protection Program for two-unit operation as approved in NRC SSERs. Because the proposed amendment is administrative in nature (updates a condition of the WBN Unit 1 OL), implementation of the amendment will not affect the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection functions.

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.

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EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

Application to Update Watts Bar Nuclear Plant Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-15-01)

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that 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.

6.0 REFERENCES

1. Letter from TVA to NRC, "Application to Update Watts Bar Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-13-18)," dated December 20, 2013 (ADAMS Accession Number ML13360A226)
2. NRC Memorandum, "Summary of January 28, 2014, Meeting with Tennessee Valley Authority Regarding Watts Bar Nuclear Plant Fire Protection Program," dated March 18, 2014 (ADAMS Accession Number ML14029A277)
3. Letter from TVA to NRC, "Withdrawal of Application to Update Watts Bar Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-13-18) - TAC MF3298," dated February 18, 2014 (ADAMS Accession Number ML14050A119)
4. Letter from NRC to TVA, "Watts Bar Nuclear Plant, Unit 1 - NRC Acceptance of Withdrawal of Request to Update Watts Bar Unit 1 Fire Protection License Condition to Allow Two-Unit Operation (TAC No. MF3298)," dated April 7, 2014 (ADAMS Accession Number ML14056A114)
5. Letter from TVA to NRC, "Watts Bar Nuclear Plant Unit 2 - Transmittal of Part V of the Unit 1/Unit 2 Fire Protection Report (TAC No. ME3091)," dated January 9, 2015
6. Letter from TVA to NRC, "Watts Bar Nuclear Plant Unit 2 - Transmittal of Unit 1/Unit 2 As-Constructed Fire Protection Report (TAC No. ME3091)," dated June 24, 2015 (ADAMS Accession Number ML15175A508)

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EVALUATION OF PROPOSED CHANGE TO LICENSE CONDITION 2.F

Application to Update Watts Bar Nuclear Plant Unit 1 License Condition 2.F to Allow Two-Unit Operation (WBN-TS-15-01)

7. NRC Generic Letter 86-10, "Implementation of Fire Protection Requirements," dated April 24, 1986
8. NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2," June 1982, and the following supplements:

Supplements					
1	September 1982	10	October 1992	19	November 1995
2	January 1984	11	April 1993	20	February 1996
3	January 1985	12	October 1993	21	February 2009
4	March 1985	13	April 1994	22	February 2011
5	November 1990	14	December 1994	23	July 2011
6	April 1991	15	June 1995	24	September 2011
7	September 1991	16	September 1995	25	December 2011
8	January 1992	17	October 1995	26	June 2013
9	June 1992	18	October 1995	27	January 2015

9. Letter from NRC to TVA, "Issuance of Facility Operating License No. NPF-90, Watts Bar Nuclear Plant, Unit 1 (TAC M94025)," dated February 7, 1996 (ADAMS Accession Number ML080290360)
10. Letter from TVA to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Operating License Application Update," dated March 4, 2009 (ADAMS Accession Number ML090700378)
11. Letter from TVA to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Transmittal of Revised Unit 1/Unit 2 As-Designed Fire Protection Report (TAC No. ME3091)," dated March 13, 2013 (ADAMS Accession Number ML13081A004)
12. Letter from TVA to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Transmittal of Unit 1/Unit 2 As-Constructed Fire Protection Report (TAC No. ME3091)," dated September 18, 2014
13. NRC Generic Letter 88-12, "Removal of Fire Protection Requirements from Technical Specifications," dated August 2, 1988
14. NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors," Revision 4, dated Fall 1981

Enclosure 1

Attachment 1

Proposed Operating License Condition Change (Mark-Up) for WBN Unit 1

(For the following mark-up, deletions are shown as strikethrough text
and additions are shown as bold text.)

- F. 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 approved in **Section 3.5 of Supplement 18 (except page 80 of Appendix FF), revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88** and Supplement **49-XX** of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- G. Deleted
- H. The licensee shall have and maintain financial protection of such types and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

Enclosure 1

Attachment 2

Proposed Operating License Condition Change (Final Typed) for WBN Unit 1

- F. 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 approved in Section 3.5 of Supplement 18 and Supplement XX of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- G. Deleted

- H. The licensee shall have and maintain financial protection of such types and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT UNIT 1

EVALUATION OF PROPOSED ADDITION OF LICENSE CONDITION 2.I

Subject: Application to Update Watts Bar Nuclear Plant Unit 1 Operating License to Add License Condition 2.I for the Fire Detection Monitoring Panel (WBN-TS-15-01)

- 1.0 SUMMARY DESCRIPTION
- 2.0 DETAILED DESCRIPTION
 - 2.1 Proposed Changes
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- 3.0 TECHNICAL EVALUATION
 - 3.1 Fire Detection System Description
 - 3.2 Fire Detection Monitoring Panel Design Change
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- 4.0 REGULATORY EVALUATION
 - 4.1 Applicable Regulatory Requirements/Criteria
 - 4.2 Precedent
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- 6.0 REFERENCES

ATTACHMENTS

- 1. Proposed Operating License Condition Change (Mark-Up) for WBN Unit 1
- 2. Proposed Operating License Condition Change (Final Typed) for WBN Unit 1

ENCLOSURE 2

EVALUATION OF PROPOSED CHANGE

Application to Update Watts Bar Nuclear Plant Unit 1 Operating License to Add License Condition 2.I for the Fire Detection Monitoring Panel (WBN-TS-15-01)

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Watts Bar Nuclear Plant (WBN) Unit 1, Facility Operating License (OL) No. NPF-90. The proposed change will revise Section 2 of the WBN Unit 1 OL which, in part, states that Facility Operating License No. NPF-90, is hereby issued to the Tennessee Valley Authority (TVA) to read as follows.

Under Section 2, TVA is proposing to add a license condition (i.e., License Condition 2.I) associated with the Fire Protection Program and specifically the fire detection monitoring panel 0-CMPT-013-M029. This new license condition will add a requirement to ensure that the fire detection monitoring panel in the main control room (MCR) either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

TVA is proposing to add a license condition to the WBN Unit 1 OL to provide time for TVA to further ensure the fire detection monitoring panel in the MCR either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

To limit this period, TVA is proposing the following License Condition:

- 2.I. By May 31, 2018, TVA shall ensure that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

2.2 Need for Proposed Changes

During the review of the WBN two-unit as-constructed Fire Protection Report (FPR) (Reference 1), a question was raised concerning the edition of the National Fire Protection Association (NFPA) code chosen for a design change and the Underwriters Laboratory (UL) standards utilized to test the functionality, safety, and reliability of system improvements made while replacing obsolete equipment used in the WBN Unit 1 fire detection monitoring panel.

To resolve this question, TVA initiated a condition report (CR) as part of TVA's corrective action program (CAP). The purpose of this CR was to identify the appropriate NFPA code for the design change that installed the fire detection monitoring panel and to document a detailed review of the alignment of the fire detection monitoring panel with the standards of a nationally recognized testing laboratory.

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The purpose of this license condition is to ensure a timely resolution of this concern and ensure installation alignment with appropriate codes and standards.

3.0 TECHNICAL EVALUATION

3.1 Fire Detection System Description

The WBN fire detection system consists of initiating devices, signaling circuits, local control panels, remote transmitter/receivers providing remote multiplex (MUX) functions, and computerized multiplex central control equipment.

The system processes basic signal types; alarm and trouble. An alarm signal is an indication of the actuation of smoke or heat detectors or the sensing of flow through fire suppression systems. Some monitoring devices also transmit an alarm signal. A trouble signal indicates the occurrence of a fault condition in the signaling system circuitry or sprinkler header pressure loss. Some supervisory signals are handled as trouble signals.

The fire detection monitoring system consists of two systems, A and B. The systems are redundant to each other and networked together ensuring that a system is reliably functioning at all times.

The fire detection system for WBN, Units 1 and 2, consists of the following components:

- Initiating Devices (IDs)
- Monitoring Devices
- Local Detection Panels
- Audible Devices
- Remote Transmitter/Receivers
- Multiplex, TVA-Computer Engineering Group (CEG) Systems

Initiating Devices (e.g., ionization, photoelectric, thermal, and duct detectors) monitor designated fire zones and heating ventilation and air conditioning (HVAC) ducts within zones throughout the facility. Some of these zones also contain manual pull stations. For monitoring devices, the fire detection system utilizes low air pressure, water flow, low level, system inoperative, engine trouble, engine running, and switch in OFF or MANUAL alarms to monitor the fire suppression systems status. A local detection panel (LDP) is a data gathering and information-processing device that monitors the state of and processes input signals from actuated IDs and monitoring devices. The audible devices for WBN fire alarms consist of distinctive and unique audible devices. Each LDP may contain 1 or 2 Transmitter/Receiver (T/R) units (MX-203), which, when polled, communicate information to the MCR Multiplex Panel.

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Operation of the TVA-CEG Multiplex System centers on the fire detection monitoring panel 0-CMPT-13-M029. This panel is located in the MCR and acts as an interface between the system electronics, the LDP, and the operator. The following components are contained within the fire detection monitoring panel:

- Two Pyrotronics Interface Devices with audio alarms
- Two Desktop personal computers
- Two Monitors
- Two Uninterruptable Power Supplies (UPS)
- Two Servers
- Two 2-Port universal serial bus keyboard-video-mouse Switches
- Two 16-Port Switches
- One Printer

The Monitors and the Pyrotronics Interface Devices provide visual and audible alarm and trouble indication. The Pyrotronics Interface Devices sound an audible alarm to notify the operator that an alarm or trouble condition is occurring. A monitor displays the specific information that tells where the condition is located. A printer prints out a hard copy of each condition upon request.

The Pyrotronics Interface Device, Central Processing Unit (CPU), Monitor, Server, and Switch are supplied with power through an UPS for each system. If external power is lost, power is supplied to these devices by the UPS internal battery.

Each system is controlled with the use of a standard keyboard and mouse. The commands are input into the system. The specific commands are numerous (e.g., enable/disable individual annunciation addresses, and acknowledge/reset alarms).

The remote transmitters/receivers communicate with the central control panels by use of shielded twisted pair wire. To accomplish this communication, the TVA-CEG multiplex system uses time division multiplex principles and frequency-shift keying modems. The modems operate in a frequency division multiplex mode. This is accomplished by using two sets of mark and space frequencies for transmission and reception of data in each direction. The central control panel polls each remote transmitter/receiver sequentially.

3.2 Fire Detection Monitoring Panel Design Change

In 2014, TVA completed a design change to replace obsolete fire detection equipment in the MCR fire detection monitoring panel 0-CMPT-013-M029. The new equipment was procured by TVA's Computer Engineering Group (CEG) and interfaced with the existing fire detection field equipment. The previous Pyrotronics Multialarm VI system, which monitored fire detection information from field panels and communicated this information to the operator in the MCR, was replaced with a new TVA-CEG multiplex system. The new assembly consists of two systems, A and B, each with panel-mounted computers and peripheral devices that perform the same functions as the previous Pyrotronics

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Multialarm VI system. The two redundant systems are networked together. Most of the new equipment was procured off-the-shelf, assembled, and provided by CEG. Two new Loop Modem (Pyrotronics) Interface Devices were built by CEG to interface with the field fire detection equipment and allows communication between the new equipment and the existing field panels. One Loop Modem Interface Device is dedicated to System A and one for System B. The existing Pyrotronics cabinet located in the MCR was reused as well as the existing cables to the fire detection field equipment. All existing peripheral devices associated with the Pyrotronics Multialarm VI system in the MCR panel were replaced with new equipment contained in the assembly provided by CEG.

The function of the equipment located inside the fire detection monitoring panel, which is part of the fire detection system, is to act as an interface between the fire detection system and the operator in the MCR. The new system performs the same output functions as the previous system and maintains the same communication control with field panels.

3.3 Acceptability of Current Design

An engineering code compliance evaluation was performed by an outside consultant as part of the design change, to ensure the new fire detection monitoring panel, as designed, built, and assembled by the TVA-CEG, met the applicable sections of UL 864 (8th edition) and NFPA 72D (1975).

The evaluation reviewed the existing licensing basis for WBN's fire detection system as contained in the WBN Unit 1 FPR. Applicable sections were reviewed and documented as shown in the design information package (DIP).

The evaluation also reviewed UL 864, 8th edition, "Standard for Safety-Control for Fire Protection Signaling Systems" and documented areas of compliance as shown in the DIP package.

For areas where compliance was not readily determined, the systems were required to undergo applicable tests to ensure compliance to these sections. The sections that required testing and which testing was to be performed were documented as shown in the DIP package.

The evaluation was submitted to TVA-CEG to ensure the system as built and assembled met the requirements of the WBN System Description for Fire Detection System, N3-12-4002, Section 2.2.12. A testing report was submitted confirming these requirements.

The evaluation was done with the following assumptions:

- The WBN fire detection system does not use coded signals
- The WBN fire detection system does not use self-restoring trouble signals
- The WBN fire detection system does not use latching trouble signals
- The WBN fire detection system does not use intermittent trouble signals

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- Fire, supervisory, and trouble audible alarms may be silenced but the corresponding visible alarm will persist until the condition is corrected
- Fire alarms take precedence over supervisory and trouble alarms
- The WBN fire protection system covers less than 25 buildings

TVA-CEG performed laboratory testing on the systems to demonstrate compliance with the applicable sections of UL 864 (8th edition) and NFPA 72D (1975) as requested and documented in the DIP package. The report of the applicable testing stated that individual tests were successful. In addition, a Post Modification Test (PMT) was performed to test the operability of the system after installation of each sub-system.

As discussed in Section 2.2, a question was raised regarding the NFPA code that was chosen for the design change associated with the fire detection monitoring panel and the nationally recognized testing laboratory standards. TVA initiated a design and licensing basis review within the TVA CAP.

TVA captured this question in its CAP by initiating a CR. Following the CR's entry into the CAP, TVA determined that immediate operability of the fire detection monitoring panel is maintained, and it is considered fully functional based on the previous functional and validation testing performed to support its design and installation. A detailed evaluation, supported by outside consultants, is in progress to assess ongoing panel functionality and other potential code and standards applicability in terms of NFPA and a nationally recognized testing laboratory. This evaluation may lead to possible design, testing, and modifications in the MCR and other plant locations including the reactor building. Any needed modifications in the reactor building would be anticipated to be accomplished in the refueling outage for each unit. The evaluation of the CR is ongoing.

3.4 Conclusions

TVA replaced portions of the fire detection monitoring panel due to obsolescence. The replacement parts were reviewed and tested by TVA CEG using standards believed to be appropriate at the time. As a result of the code and testing questions raised, TVA proposes to add a License Condition to further ensure the fire detection monitoring panel meets appropriate industry standards or is tested and found suitable.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.48 requires that each operating nuclear power plant have a fire protection plan that satisfies GDC 3. It specifies what should be contained in such a plan and lists the basic fire protection guidelines for the plan. For WBN Unit 1, the plan that satisfies these requirements is the WBN Unit 1 FPR.

General Design Criterion (GDC) 3, "Fire Protection," of Appendix A to 10 CFR 50 requires that structures, systems, and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effect

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of fires and explosions. GDC 3 also states that fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety.

The fire detection system is intended to satisfy the requirements set forth in Appendix A to Branch Technical Position APCS 9.5-1, "Guide for Fire Protection of Nuclear Power Plants, Docketed Prior to July 1, 1976," and 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire protection of safe shutdown capability."

The fire detection system was designed to the applicable sections (as documented in the FPR) of NFPA 72D-1975 and NFPA 72E-1974. NFPA 72D-1975 states that alarms shall annunciate in a continuously occupied location. Additionally, NFPA 72-2007 and -2013 had potential code applicability for the design change discussed.

In the event the existing panel requires modification or replacement, completion of the required actions for this license condition may require installation work to be performed during a subsequent refueling outage for each unit. To allow sufficient time for design, parts procurement, and testing of any required changes, a date of May 31, 2018 has been selected.

With the implementation of the proposed change, WBN Unit 1 will continue to meet the applicable regulations and requirements listed above.

4.2 Precedent

TVA has identified no suitable precedent where a new fire protection license condition for an operating unit was issued to ensure that a listing organization acceptable to the NRC determines that the fire detection monitoring panel in the MCR either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

4.3 Significant Hazards Consideration

Tennessee Valley Authority (TVA) replaced obsolete fire detection equipment in main control room (MCR) panel 0-CMPT-013-M029. The new equipment interfaces with the existing fire detection field equipment. The installed monitoring panel was designed to NFPA 72D code consisting of Underwriters Laboratory (UL) listed components and other components, which were collectively tested as a complete unit by TVA, commensurate with sections assessed as applicable to the UL standard for fire alarm systems. These activities resulted in a detailed and comprehensive testing and software verification and validation process to support installation of the replacement fire detection monitoring panel.

During the review of the two-unit FPR, a question was raised concerning the chosen NFPA code and the UL standards utilized to test the functionality, safety, and reliability following implementation of the design change.

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To resolve the concern in a timely manner, the proposed change will add Section 2.I (i.e., License Condition 2.I) to the Watts Bar Nuclear Plant (WBN) Unit 1 Facility Operating License (OL). Section 2.I is a license condition associated with fire protection adding a requirement to ensure that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room (MCR) either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment 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 change adds a requirement to ensure the fire detection monitoring panel in the MCR meets appropriate design standards or is tested and found suitable while not effecting any plant structures, systems, or components (SSCs). The change does not affect plant operations, any design function or an analysis that verifies the capability of an SSC to perform a design function. Because no plant equipment or method of evaluation are affected by this change, the proposed amendment does not change any of the previously evaluated accidents in the updated final safety analysis report (UFSAR).

No accident analysis conclusions made in the WBN Unit 1 UFSAR are affected. The proposed change does not revise or affect the Fire Hazards Analysis (FHA) or any component required for a fire safe shutdown.

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

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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 change adds a requirement to ensure the fire detection monitoring panel in the MCR meets appropriate design standards or is tested and found suitable and does not change any design function, operation of an SSC, performance of testing or maintenance of an SSC. This proposed change is limited in scope and does not revise or affect the FHA or any component required for a fire safe shutdown. In addition, no accident analysis conclusions made in the WBN Unit 1 UFSAR are affected. Based on this, the proposed amendment will not alter the requirements or function for systems required during accident conditions.

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

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

Response: No.

This proposed change adds a requirement to ensure that the fire detection monitoring panel in the MCR either meets the appropriate designated standards or has been tested and found suitable for the specified purpose. Implementation of the amendment (the addition of a license condition to the WBN Unit 1 OL) will not affect the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection functions.

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.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that 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.

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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.

6.0 REFERENCE

1. Letter from TVA to NRC, "Watts Bar Nuclear Plant Unit 2 - Transmittal of Unit 1/Unit 2 As-Constructed Fire Protection Report (TAC No. ME3091)," dated June 24, 2015 (ADAMS Accession Number ML15175A508)

Enclosure 2

Attachment 1

Proposed Operating License Condition Change (Mark-Up) for WBN Unit 1

(For the following mark-up, deletions are shown as strikethrough text and additions are shown as bold text.)

- F. 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 approved in Section 3.5 of Supplement 18 (except page 80 of Appendix FF), revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88 and Supplement 19 of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- G. Deleted

- H. The licensee shall have and maintain financial protection of such types and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

- I. **By May 31, 2018, TVA shall ensure that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.**

Enclosure 2

Attachment 2

Proposed Operating License Condition Change (Final Typed) for WBN Unit 1

- F. 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 approved in Section 3.5 of Supplement 18 (except page 80 of Appendix FF), revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88 and Supplement 19 of the SER (NUREG 0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- G. Deleted

- H. The licensee shall have and maintain financial protection of such types and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

- I. By May 31, 2018, TVA shall ensure that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.