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

February 17, 2012

10 CFR 50.4

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

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Additional Planned Fire Risk Reduction Modifications for Browns Ferry Nuclear Plant Units 1, 2, and 3**

Reference: Letter from TVA to NRC, "Revised Submittal Schedule for License Amendment Request to Adopt National Fire Protection Association (NFPA) 805, Performance-Based Standard for Fire Protection For Light Water Reactor Generating Plants, 2001 Edition for Browns Ferry Nuclear Plant Units 1, 2, and 3," dated January 13, 2012.

At a public meeting between the representatives of the Tennessee Valley Authority (TVA) and the NRC staff on December 8, 2011, TVA described its strategy for reducing fire risk at the Browns Ferry Nuclear Plant (BFN). That strategy includes performing modifications to BFN and its associated procedures in parallel with development of a license amendment request to adopt National Fire Protection Association (NFPA) Standard 805. The objective of the parallel approach has been to achieve meaningful reduction in fire risk at BFN while pursuing the improved regulatory basis provided by the NFPA Standard 805. As discussed at the December 8, 2011, meeting, TVA has completed several key modifications to the facility that have improved risk and substantially reduced the number of time critical operator manual actions required to implement the current safe shutdown fire strategy.

By letter dated January 13, 2012 (Reference), TVA provided a revised schedule for submitting an application to adopt the NFPA Standard 805 for BFN. In that letter, TVA also committed to provide a detailed list of additional planned modifications and associated implementation schedules for reducing fire risk at BFN. TVA committed to provide that information by February 17, 2012. Enclosure 1 to this letter contains a detailed list of planned fire risk reduction modifications and the planned implementation schedules.

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The modifications and associated implementation schedules in the Enclosure 1, Table 2 are new commitments.

If you have any question on these matters, please contact Tom Hess at (423)751-3487.

Respectfully,

J. W. Shea
Manager, Corporate Nuclear Licensing

Enclosures:
1. National Fire Protection Association (NFPA) 805 Parallel Modification Strategy
2. Regulatory Commitments

cc (Enclosures):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Browns Ferry Nuclear Plant

ENCLOSURE 1

Tennessee Valley Authority

Browns Ferry Nuclear Plant, Units 1, 2, and 3

National Fire Protection Association (NFPA) 805 Parallel Modification Strategy

ENCLOSURE 1

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 805 PARALLEL MODIFICATION STRATEGY

Introduction

As discussed in the public meeting between the NRC staff and the Tennessee Valley Authority (TVA) representatives on December 8, 2011 and by letter dated January 13, 2012 (Reference 1), TVA is pursuing the strategy of performing modifications to Browns Ferry Nuclear Plant (BFN) and its associated procedures in parallel with development of a license amendment request to adopt NFPA Standard 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generation Plants," 2001 Edition. The objective of the parallel approach is to achieve meaningful reduction in fire risk at BFN while pursuing the improved regulatory basis provided by NFPA Standard 805. TVA has completed several key modifications to the facility that have improved risk and substantially reduced the number of time critical operator manual actions required to implement the current safe shutdown fire strategy. While finalizing the submittal of the NFPA 805 application, TVA is continuing its approach of developing and implementing additional fire risk reduction modifications to BFN design and procedures.

Completed Modifications

Beginning in 2009, internal reviews and risk insights from the NRC significance determination process (SDP) conducted as a result of EA-09-307 (Reference 2) were utilized to identify risk improvements which would be consistent with the NFPA 805 transition. Table 1 provides a summary of the modifications that have already been completed for BFN.

Planned Modifications

The NFPA 805 transition analysis has progressed to the point where a number of modifications to support the NFPA 805 transition have been identified. TVA has further identified a subset of these modifications that can be implemented while still maintaining compliance within the BFN current Appendix R licensing basis to reduce fire risk and eliminate Operator Manual Actions (OMAs) before NFPA 805 transition. In order to accomplish the TVA strategy of risk reduction in parallel with NFPA 805 transition, these modifications are currently being scheduled for design and implementation in accordance with the plant work control process.

Table 2 provides a summary and planned completion milestone for the currently identified NFPA 805 modifications which have been selected for implementation. Each modification is identified by the Design Change Notice (DCN) number and the stage of the DCN, if applicable, that addresses a specific piece of plant equipment. Each stage of a DCN is designed to be implemented separately. Table 2 also includes a brief description of how the modification will address fire risk. The schedule date provided reflects the current planned refueling outage or online window for removing the affected equipment from service and the Commitment Milestone represents a later date by which TVA is confident that the modification will be implemented considering changing plant conditions and schedules.

References

1. Letter from TVA to NRC, "Revised Submittal Schedule for License Amendment Request to Adopt National Fire Protection Association (NFPA) 805, Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants, 2001 Edition for Browns Ferry Nuclear Plant Units 1, 2, and 3," dated January 13, 2012.

2. Letter from NRC to TVA, EA-09-307, "Final Significance Determination of Yellow and White Findings and Notice of Violation (NRC Inspection Report Nos. 05000259/2010007, 05000260/2010007 and 05000296/2010007), Browns Ferry Nuclear Plant," dated April 19, 2010.

Table 1: List of Completed Modifications of Plant Equipment or Procedures

DCN # / Stage #	Description	Basis for Modification	Completion Date
69786/S1	Removed power from the Condensate Storage Tank (CST) supply and return valves to the High Pressure Coolant Injection System (HPCI) and the Reactor Core Isolation Cooling System (RCIC) to prevent spurious closure. 1-FCV-002-0170 & 0171 2-FCV-002-0162 & 0163 3-FCV-002-0166 & 0167	In the event of a fire in Fire Area (FA) 26 (Turbine Building), this modification eliminated the requirement to switch HPCI or RCIC suction to the Suppression pool and increases the availability of the CSTs as makeup source.	9/23/10
69786/S2	Deleted requirements to manually start Unit 3 Diesel Auxiliary Board room fans by crediting automatic start capability 3-FAN-030-0243 and 3-FAN-030-0244	In the event of a fire in numerous FAs, this analysis eliminated OMAs to start the fans locally.	9/23/10
69786/S4	Changed Breaker 710 on Battery Board 3 to be normally OPEN.	In the event of a fire in numerous FAs, this modification eliminated OMAs that were required to open breaker 710 to limit battery loading.	9/23/10
70011	Installed incipient fire detection in 250V Reactor Motor Operated Valve (RMOV) Board 1A Sections 1-6	In the event of a fire in the 250V RMOV Board 1A Sections 1-6 (FA 5), cable trays located directly above this ignition source impact safe shutdown. The incipient detection system reduces the probability of a serious fire from this source.	3/31/11
70019	Installed cable tray bottom covers in selected areas where redundant divisions are in close proximity above Unit 1, 2, and 3 Electrical Board Rooms on Reactor Building Elevation 593'.	The cable tray covers delay cable tray ignition for at least 20 minutes and increase the probability that a cable tray fire will be suppressed prior to its spreading to other trays.	4/4/11

DCN # / Stage #	Description	Basis for Modification	Completion Date
69957	Installed a 3 hour fire barrier between the Turbine Building and Intake structure tunnel separating the Intake and the Turbine Building into separate fire areas	Installation of the barrier provided additional divisional separation which allowed for a general revision to the Safe SSIs for the Intake and Turbine Building fire areas (FAs 25 and 26). This revision eliminated operator actions which were no longer required and abandoned the Self Induced Station Blackout (SISBO) strategy used previously, in these FAs.	10/28/11

Table 2: List of Planned Modifications of Plant Equipment or Procedures

DCN # / Stage #	Description	Basis for Modification	Completion Milestone
70434/S1	Install fuses in ammeter circuit for Battery Board 1.	In the event of fire damage to cables between Battery Board 1 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	COMPLETE (12/23/11)
70434/S2	Install fuses in ammeter circuit for Battery Board 2.	In the event of fire damage to cables between Battery Board 2 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	9/27/13
70434/S3	Install fuses in ammeter circuit for Battery Board 3.	In the event of fire damage to cables between Battery Board 3 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	9/16/12
70434/S4	Install fuses in ammeter circuit for Battery Board 4.	In the event of fire damage to cables between Battery Board 4 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	6/22/12
70434/S5	Install fuses in ammeter circuit for Battery Board 5.	In the event of fire damage to cables between Battery Board 5 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	COMPLETE (12/23/11)
70434/S6	Install fuses in ammeter circuit for Battery Board 6.	In the event of fire damage to cables between Battery Board 6 and the Control Room, multiple hot shorts could cause the ammeter cables to auto ignite and spread the fire to other areas.	4/6/12
70054	Install controls in the Main Control Room to isolate 4kV Shutdown Board 3EC from fire damage in 4kV Shutdown Board 3EA.	In the event of a fire in FA 22 (4kV Shutdown Board Room 3EA and 3EB), OMAs are currently required at 4kV Shutdown Board 3EC to isolate control circuit faults and operate switchgear locally. Local actions are in the vicinity of the fire and may be hampered by smoke and firefighting activities. The modification will eliminate the need for the OMAs.	Prior to restart from Unit 3 Refueling outage 15 (Spring 2012)
70490/S1	Isolate and abandon local control station for Residual Heat Removal Service Water (RHRSW) Pump A3.	In the event of a fire in FAs 25-1 and 25-2 (Intake Structure), 2 OMAs are currently required at 4kV Shutdown Board 3EA to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for the OMAs.	1/11/13

DCN # / Stage #	Description	Basis for Modification	Completion Milestone
70490/S2	Isolate and abandon local control station for RHRSW Pump B1.	In the event of a fire in FA 25-1(Intake Structure), an OMA is currently required at 4kV Shutdown Board 3EC to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	10/12/12
70490/S3	Isolate and abandon local control station for RHRSW Pump B2.	In the event of a fire in FA 25-1 (Intake Structure), an OMA is currently required at 4kV Shutdown Board C to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	12/14/12
70490/S4	Isolate and abandon local control station for RHRSW Pump B3.	In the event of a fire in FA 25-1 (Intake Structure), an OMA is currently required at 4kV Shutdown Board C to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	12/14/12
70490/S5	Isolate and abandon local control station for RHRSW Pump C1.	In the event of a fire in FAs 25-1, 25-3 (Intake Structure) and 26 (Turbine Building), 3 OMAs are currently required at 4kV Shutdown Board B to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for the OMAs.	1/4/13
70490/S6	Isolate and abandon local control station for RHRSW Pump C2.	In the event of a fire in FAs 25-1, 25-3 (Intake Structure), and 26 (Turbine Building), 3 OMAs are currently required at 4kV Shutdown Board B to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for the OMAs.	3/1/13
70490/S7	Isolate and abandon local control station for RHRSW Pump C3.	In the event of a fire in FAs 25-1 and 25-3 (Intake Structure), 2 OMAs are currently required at 4kV Shutdown Board 3EB to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for the OMAs.	3/1/13
70490/S8	Isolate and abandon local control station for RHRSW Pump D1.	In the event of a fire in FA 25-1 (Intake Structure), an OMA is currently required at 4kV Shutdown Board 3ED to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	2/22/13
70490/S9	Isolate and abandon local control station for RHRSW Pump D2.	In the event of a fire in FA 25-1 (Intake Structure), an OMA is currently required at 4kV Shutdown Board D to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	2/15/13

DCN # / Stage #	Description	Basis for Modification	Completion Milestone
70490/S10	Isolate and abandon local control station for RHRSW Pump D3.	In the event of a fire in FA 25-1 (Intake Structure), an OMA is currently required at 4kV Shutdown Board D to isolate control circuit faults and operate the switchgear locally. The modification will eliminate the need for this OMA.	12/14/12
70491/S1	Install relays to isolate 4kV Shutdown Board A Normal Feeder Breaker 1614 control circuit from fire damage in 4kV Shutdown Board D.	In the event of a fire in FA 8 (4kV Shutdown Board Room D), an OMA is currently required at 4kV Shutdown Board A to isolate control circuit faults and operate the breaker locally. The modification will eliminate the need for this OMA.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
70491/S2	Install relays to isolate 4kV Shutdown Board A Alternate Feeder Breaker 1716 control circuit from fire damage in 4kV Shutdown Board C.	In the event of a fire in FAs 2-3 (Unit 2 Reactor Building) and 9 (4 kV Shutdown Board Room C), 2 OMAs are currently required at 4kV Shutdown Board A to isolate control circuit faults and operate the breaker locally. The modification will eliminate the need for the OMAs	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
70491/S3	Install relays to isolate 4kV Shutdown Board A Crosstie Breaker 1824 control circuit from fire damage in 4kV Shutdown Board 3EA.	In the event of a fire in FAs 3-1, 3-2, 3-3 (Unit 3 Reactor Building), and 22 (4kV Shutdown Board Rooms 3EA and 3EB), 4 OMAs are currently required at 4kV Shutdown Board A to isolate control circuit faults and operate the breaker locally. The modification will eliminate the need for the OMAs.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
70491/S12	Install relays to isolate 4kV Shutdown Board D Normal Feeder Breaker 1724 control circuit from fire damage in 4kV Shutdown Board C.	In the event of a fire in FA 9 (4kV Shutdown Board Room C),an OMA is currently required at 4kV Shutdown Board D to isolate control circuit faults and operate the breaker locally. The modification will eliminate the need for this OMA.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)

DCN # / Stage #	Description	Basis for Modification	Completion Milestone
70491/S13	Install relays to isolate 4kV Shutdown Board D Crosstie Breaker 1826 control circuit from fire damage in 4kV Shutdown Board 3ED.	In the event of a fire in FAs 3-2, 3-3 (Unit 3 Reactor Building), 21 (Unit 3 Diesel Generator Building), and 23 (4kV Shutdown Board Rooms 3EC and 3ED), 4 OMAs are currently required at 4kV Shutdown Board D to isolate control circuit faults and operate the breaker locally. The modification will eliminate the need for the OMAs.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)
70492	Separate normal power cables for 480 RMOV Board 3B from FA 13.	In the event of a fire in FA 13 (Unit 3 Electrical Board Room, Division 1), an OMA is required at 480V RMOV Board 3B to isolate the normal power feed and transfer to alternate power feed. The modification will eliminate the need for the OMA.	Prior to restart from Unit 3 Refueling outage 16 (Spring 2014)
70493/S1	Install incipient fire detection in the Unit 1 Auxiliary Instrument Room.	In the event of a fire in the Auxiliary Instrument Room of any unit (FA 16), shutdown from outside the control room is required. The incipient detection system reduces the probability of a serious fire requiring control room abandonment by identifying combustion products before a significant fire develops.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
70493/S2	Install incipient fire detection in the Unit 2 Auxiliary Instrument Room.	In the event of a fire in the Auxiliary Instrument Room of any unit (FA 16), shutdown from outside the control room is required. The incipient detection system reduces the probability of a serious fire requiring control room abandonment by identifying combustion products before a significant fire develops.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)
70493/S3	Install incipient fire detection in the Unit 3 Auxiliary Instrument Room.	In the event of a fire in the Auxiliary Instrument Room of any unit (FA16), shutdown from outside the control room is required. The incipient detection system reduces the probability of a serious fire requiring control room abandonment by identifying combustion products before a significant fire develops.	Prior to restart from Unit 3 Refueling outage 16 (Spring 2014)
70494	Separate normal cables required for Unit 1 RCIC from FA 17.	In the event of a fire in the Battery Board Room 1 (FA 17), High Pressure Injection is not available. 7 OMAs are required within 20 minutes to support Unit 1 shutdown. This modification will make Unit 1 RCIC available and extend the time available for OMAs to 2 hours and reduce the risk of human error.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)

ENCLOSURE 2

Tennessee Valley Authority

Browns Ferry Nuclear Plant, Units 1, 2, and 3

Regulatory Commitments

ENCLOSURE 2

REGULATORY COMMITMENTS

TVA commits to completing the following modifications by the dates listed.

	Modification	Commitment Date
1	Install fuses in ammeter circuit for Battery Board 2.	9/27/13
2	Install fuses in ammeter circuit for Battery Board 3.	9/16/12
3	Install fuses in ammeter circuit for Battery Board 4.	6/22/12
4	Install fuses in ammeter circuit for Battery Board 6.	4/6/12
5	Install controls in the Main Control Room to isolate 4kV Shutdown Board 3EC from fire damage in 4kV Shutdown Board 3EA.	Prior to restart from Unit 3 Refueling outage 15 (Spring 2012)
6	Isolate and abandon local control station for Residual Heat Removal Service Water (RHRSW) Pump A3.	1/11/13
7	Isolate and abandon local control station for RHRSW Pump B1.	10/12/12
8	Isolate and abandon local control station for RHRSW Pump B2.	12/14/12
9	Isolate and abandon local control station for RHRSW Pump B3.	12/14/12
10	Isolate and abandon local control station for RHRSW Pump C1.	1/4/13
11	Isolate and abandon local control station for RHRSW Pump C2.	3/1/13
12	Isolate and abandon local control station for RHRSW Pump C3.	3/1/13
13	Isolate and abandon local control station for RHRSW Pump D1.	2/22/13
14	Isolate and abandon local control station for RHRSW Pump D2.	2/15/13
15	Isolate and abandon local control station for RHRSW Pump D3.	12/14/12
16	Install relays to isolate 4kV Shutdown Board A Normal Feeder Breaker 1614 control circuit from fire damage in 4kV Shutdown Board D.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)

	Modification	Commitment Date
17	Install relays to isolate 4kV Shutdown Board A Alternate Feeder Breaker 1716 control circuit from fire damage in 4kV Shutdown Board C.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
18	Install relays to isolate 4kV Shutdown Board A Crosstie Breaker 1824 control circuit from fire damage in 4kV Shutdown Board 3EA.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
19	Install relays to isolate 4kV Shutdown Board D Normal Feeder Breaker 1724 control circuit from fire damage in 4kV Shutdown Board C.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)
20	Install relays to isolate 4kV Shutdown Board D Crosstie Breaker 1826 control circuit from fire damage in 4kV Shutdown Board 3ED.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)
21	Separate normal power cables for 480 RMOV Board 3B from FA 13.	Prior to restart from Unit 3 Refueling outage 16 (Spring 2014)
22	Install incipient fire detection in the Unit 1 Auxiliary Instrument Room.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)
23	Install incipient fire detection in the Unit 2 Auxiliary Instrument Room.	Prior to restart from Unit 2 Refueling outage 17 (Spring 2013)
24	Install incipient fire detection in the Unit 3 Auxiliary Instrument Room.	Prior to restart from Unit 3 Refueling outage 16 (Spring 2014)
25	Separate normal cables required for Unit 1 RCIC from FA 17.	Prior to restart from Unit 1 Refueling outage 10 (Fall 2014)