



1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-074

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10 CFR 50.90

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

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

Subject: **Update to License Amendment Request to Adopt NFPA 805  
Performance-Based Standard for Fire Protection for Light Water  
Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant,  
Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)**

- References:
1. Letter from TVA to NRC, "License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition) (Technical Specification Change TS-480)," dated March 27, 2013 (ADAMS Accession No. ML13092A393)
  2. Letter from TVA to NRC, "Response to NRC Request to Supplement License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)," dated May 16, 2013 (ADAMS Accession No. ML13141A291)
  3. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Set 1," dated December 20, 2013 (ADAMS Accession No. ML13361A093)
  4. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Set 2," dated January 10, 2014 (ADAMS Accession No. ML1401A088)

5. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Set 3," dated January 14, 2014 (ADAMS Accession No. ML14077A201)
6. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Set 4," dated February 13, 2014 (ADAMS Accession No. ML14055A305)
7. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Set 5," dated March 14, 2014 (ADAMS Accession No. ML14079A159)
8. Letter from TVA to NRC, "Update to the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)," dated May 30, 2014 (ADAMS Accession No. ML14154A496)
9. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Attachment X and Fire Modeling," dated June 13, 2014 (ADAMS Accession No. ML14167A175)
10. Letter from TVA to NRC, "Response to the Nuclear Regulatory Commission's (NRC) Request for Additional Information Regarding the License Amendment Request to Adopt National Fire Protection Association 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)- Attachment X (second set)," dated July 10, 2014 (ADAMS Accession No. ML14192B044)

11. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Probabilistic Risk Assessment Follow Up (60-Day Responses)," dated August 29, 2014 (ADAMS Accession No. ML14248A291)
12. Letter from TVA to NRC, "Update to the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)" dated September 16, 2014 (ADAMS Accession No. ML14260A324)
13. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Probabilistic Risk Assessment Follow Up (90-Day Responses)," dated October 6, 2014 (ADAMS Accession No. ML14281A154)
14. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Probabilistic Risk Assessment Follow Up (162-Day Responses)," dated December 17, 2014 (ADAMS Accession No. ML14363A056)
15. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187) - Containment and Ventilation Branch Follow-up," dated March 26, 2015 (ADAMS Accession No. ML15086A382)
16. Letter from TVA to NRC, "Response to NRC Request for Additional Information Regarding the License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (TAC Nos. MF1185, MF1186, and MF1187)- Probabilistic Risk Assessment Branch Follow-up," dated April 9, 2015 (ADAMS Accession No. ML15099A716)

17. Electronic Mail from F. Saba (NRC) to G. Williams (TVA) and C. Szabo (TVA), "Browns Ferry RAI," dated May 29, 2015 (ADAMS Accession No. ML15152A306)
18. Electronic Mail from F. Saba (NRC) to G. Williams (TVA) and C. Szabo (TVA), "Browns Ferry NFPA 805 LAR," dated June 12, 2015 (ADAMS Accession No. ML15163A057)
19. Letter from TVA to NRC, "Change in Commitment Related to Interim Compensatory Measure to Reduce Fire Risk," dated August 14, 2014 (ADAMS Accession No. ML14231A961)
20. Letter from TVA to NRC, "Change in Commitment Related to Interim Compensatory Measure to Reduce Fire Risk," dated August 26, 2014 (ADAMS Accession No. ML14239A325)

By letter dated March 27, 2013 (Reference 1), Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, to transition to National Fire Protection Association Standard (NFPA) 805. In addition, by letter dated May 16, 2013 (Reference 2), TVA provided information to supplement the Reference 1 letter.

By electronic mail dated May 29, 2015 (Reference 17), NRC requested clarifying information related to Probabilistic Risk Assessment (PRA) Request for Information (RAI) 18. NRC requested that this clarification be provided by June 15, 2015. The June 15, 2015, date was subsequently changed to June 19, 2015, during a conference call with the NRC Project Manager. Enclosure 1 to this letter provides the clarifying information.

Enclosure 2 to this letter provides descriptions of changes to LAR, Attachment S, "Modifications and Implementation Items," Table S-2, "Plant Modifications Committed," and Table S-3, "Implementation Items," incorporated by TVA since the TVA letter dated March 26, 2015 (Reference 15).

Enclosure 3 to this letter provides marked up pages showing changes to LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," associated with changes to Table S-3, Implementation Item 36 described in Enclosure 2 to this letter

Enclosure 4 to this letter provides updated retyped Renewed Facility Operating License pages incorporating the proposed transition License Conditions 2.C.(13), 2.C.(14), and 2.C.(7) for BFN Units 1, 2, and 3, respectively, originally submitted in LAR, Attachment M, "License Condition Changes," by TVA letters dated March 27, 2013 (Reference 1), and May 16, 2013 (Reference 2). The updated pages are revised to ensure the proposed transition License Conditions for BFN Units 1, 2, and 3 appropriately reflect the modifications and implementation items that must be completed to support the transition to NFPA 805. These modifications and implementation items are listed in LAR, Attachment S, Table S-2, and Table S-3, respectively.

In addition, for the implementation items listed in LAR, Attachment S, Table S-3, TVA requests an implementation period of within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage. If the 240-day implementation period falls within a scheduled refueling outage, then implementation will occur within 60 days after startup from that scheduled refueling outage. The proposed implementation period considers site resources required to prepare and support the BFN Unit 3 refueling outage scheduled to begin in late February 2016 and continue to the end of March 2016. The proposed implementation period ensures that the implementation date falls well outside of the BFN Unit 3 refueling outage.

Under "Other Changes that May Be Made Without Prior NRC Approval," TVA added a statement specifying that this License Condition (i.e., Conditions 2.C.(13), 2.C.(14), and 2.C.(7) for BFN Units 1, 2, and 3, respectively) does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805. Under "Transition License Conditions," TVA revised items 2 and 3. Item 2 was revised to specify that plant modifications as described in Table S-2 provided in Enclosure 6 to this letter will be completed by the end of the second refueling outage (for each unit) following issuance of the license amendment and to require that TVA maintain appropriate compensatory measures in place until completion of these modifications. Item 3 was revised to specify that:

1. TVA will complete the implementation items as listed in Table S-3 provided in Enclosure 5 to this letter within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage, then implementation will occur within 60 days after startup from that scheduled refueling outage.
2. Implementation items 32 and 33 are associated with plant modifications that will be completed in accordance with the plant modifications schedule.

Enclosure 5 to this letter provides an updated LAR, Attachment S, Table S-3. The enclosed Table S-3 replaces the original LAR Table S-3, provided in References 1 and 2, in its entirety. The updated Table S-3 reflects changes previously submitted to the NRC by TVA in the Reference 3 through 16 letters and the additional changes described in Enclosure 1 to this letter. In addition, the updated LAR Table S-3 contains a new Implementation Item 49 incorporating LAR Supplement, Enclosure 2, Regulatory Commitment 2, as requested by the NRC by electronic mail dated June 12, 2015 (Reference 18), stating, "Revise the program that monitors BFN Residual Heat Removal (RHR) heat exchanger performance for consistency with the assumptions of the NFPA 805 Net Positive Suction Head (NPSH), Containment Parameters, and AREVA Fuel peak centerline temperature (PCT) Analysis calculation related to the RHR heat exchanger k-factor." LAR Table S-3, Implementation Item 37 has also been revised, as requested by the Reference 18 electronic mail, to state, "Revise design output to ensure interior epoxy floor finishes meet the Class I requirements and interior carpet floor finishes meet the Class I requirements."

Enclosure 6 to this letter provides an updated LAR, Attachment S, Table S-2. The enclosed Table S-2 replaces the original LAR Table S-2, provided in References 1 and 2, in its entirety. The updated Table S-2 reflects changes previously submitted to the NRC by TVA in the Reference 3 through 16 letters and the additional changes described in Enclosure 2 to this letter. Enclosure 6 to this letter contains security-related information and should be withheld from public disclosure under 10 CFR 2.390.

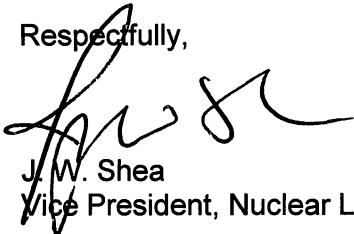
Enclosure 7 to this letter provides an updated NFPA 805 Regulatory Commitment List. As described above, the NRC has requested that TVA revise LAR Table S-3 to include LAR Supplement, Regulatory Commitment 2. With this change, TVA has revised Regulatory Commitment 2 to state, "Requirement relocated to NFPA 805 License Amendment Request, Attachment S, Table S-3." The change to Regulatory Commitment 2 is indicated in Enclosure 7 by a revision bar to the right of the change. Please note that Commitment 3 was revised by TVA letter dated August 14, 2014 (Reference 19) and Commitments 4 and 14 were revised by TVA letter dated August 26, 2014 (Reference 20). Enclosure 7 provides a complete updated regulatory commitment list that supersedes the previous commitment list provided in the Reference 2 letter.

Consistent with the standards set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.92(c), TVA has determined that the additional information, as provided in this letter, does not affect the no significant hazards consideration associated with the proposed application previously provided in Reference 1.

There are no new regulatory commitments contained in this submittal. Please address any questions regarding this submittal to Mr. Edward D. Schrull at (423) 751-3850.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 19th day of June 2015.

Respectfully,

A handwritten signature in black ink, appearing to read 'J. W. Shea', is written over the printed name and title.

J. W. Shea  
Vice President, Nuclear Licensing

Enclosures

cc: See Page 7

Enclosures:

1. Response to Probabilistic Risk Assessment (PRA) Request for Additional Information (RAI) 18.01
2. Discussion of changes to NFPA 805 License Amendment Request, Attachment S, "Modifications and Implementation Items," Table S-2, "Plant Modifications Committed," and Table S-3, "Implementation Items"
3. License Amendment Request, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Markup Pages
4. Updated NFPA 805 License Amendment Request, Attachment M, "License Condition Changes," Retyped Renewed Facility Operating License Pages
5. Updated NFPA 805 License Amendment Request, Attachment S, Table S-3, "Implementation Items"
6. Updated NFPA 805 License Amendment Request, Attachment S, Table S-2, "Plant Modifications Committed"
7. NFPA 805 Regulatory Commitment List

cc (Enclosure):

NRC Regional Administrator – Region II  
NRC Senior Resident Inspector – Browns Ferry Nuclear Plant  
NRC Project Manager - Browns Ferry Nuclear Plant  
State Health Officer, Alabama State Department of Health  
NRC Branch Chief - Region II

## ENCLOSURE 1

### Tennessee Valley Authority Browns Ferry Nuclear Plant, Units 1, 2, and 3

#### Response to Probabilistic Risk Assessment (PRA) Request for Additional Information (RAI) 18.01

##### **PRA RAI 18.01**

*PRA RAI 18 requested clarification about how the compliant and variant plants were modeled to determine the  $\Delta$ CDF and  $\Delta$ LERF for the control room and cable spreading room abandonment scenarios. The response to PRA RAI 18 generally states that 'abandonment scenarios' are modeled using the "backup control panel" for both the post-transition and the complaint plant PRA models, and discusses some functional success paths. However, the response neither indicates how VFDRs are identified nor how the associated fire-damaged cables and equipment, and thus VFDRs, are removed from the compliant plant quantification in each fire area that includes shutdown from the backup control panel.*

- a) Confirm that the equipment damaged by each fire in fire areas that includes shutdown from the backup control panel has been identified using the Brown's Ferry fire damage methodology and is assumed to fail in the FPRA. If not, please clarify how equipment damage is identified and modeled.*
- b) Confirm that all applicable equipment undamaged by each fire is nominally available to mitigate the fire, i.e., is credited in the PRA model. Summarize any differences between the nominally available equipment in the complaint versus the variant plant.*
- c) Explain how the VFDRs within these areas were identified (e.g., must a VFDR fail all success paths in the area and also fail the success path at the backup control panel to be identified as a VFDR?).*

##### **TVA Response**

###### **Part a**

Shutdown from the backup control panel is only considered for a subset of fire scenarios occurring in Fire Area 16. Fire Area 16 includes the main control rooms and cable spreading rooms (Fire Compartment 16-A), and auxiliary instrument rooms (Fire Compartments 16-K, 16-M, and 16-O).

In the Fire PRA, the equipment damaged (i.e., failed) in fire scenarios occurring in the main control rooms was identified using the BFN fire damage methodology. The BFN fire damage methodology is consistent with the treatment of main control room fires explained in NUREG/CR-6850, "EPRI/NRC-RE Fire PRA Methodology for Nuclear Power Facilities," Section 11.5.2.

In the Fire PRA, the equipment damaged (i.e., failed) in fire scenarios occurring in the cable spreading rooms or auxiliary instrument rooms was identified using the BFN detailed fire damage methodology. The BFN detailed fire damage methodology is consistent with the detailed fire modeling approach explained in NUREG/CR-6850, Chapter 11.



## **Part b**

For each fire scenario, all applicable equipment credited in the Fire PRA and undamaged by fire is available to mitigate the fire, to the extent that it does not fail randomly.

Regarding equipment availability, the difference between the variant and compliant plants is that the variant plant credits nominally available equipment resulting from all planned modifications, while the compliant plant is modeled by "toggling" off or excluding basic events to remove the fire-induced failures associated with the VFDRs.

## **Part c**

Fire Area 16 includes shutdown from the backup control panel (i.e., Primary Control Station). The only action considered to take place in the Main Control Room for the purposes of identifying VFDRs in Fire Area 16 is manual reactor scram. Performance Goal success was evaluated by considering the required equipment with the least amount of damage. If fire damage could not be resolved by more detailed circuit analysis justification or operator action taken at the Primary Control Station, then the fire damage preventing the Performance Goal from being met was identified as a VFDR. The VFDR identified the component(s) affected (directly or indirectly via cable damage) and the Performance Goal or system that is affected by the failure(s).

**ENCLOSURE 2**

**Tennessee Valley Authority  
Browns Ferry Nuclear Plant, Units 1, 2, and 3**

**Discussion of changes to NFPA 805 License Amendment Request, Attachment S,  
"Modifications and Implementation Items," Table S-2, "Plant Modifications Committed,"  
and Table S-3, "Implementation Items"**

(24 pages including cover)

## **Deletion of Completed Modifications From Table S-2**

NFPA 805 License Amendment Request (LAR), Attachment S, Table S-2 provided a list of NFPA 805 related modification items that TVA committed to install. Since submittal of the NFPA 805 LAR by letter dated March 27, 2013, as supplemented by letter dated May 16, 2013, TVA has completed the installation of the following modifications:

<u>Item</u>	<u>Modification</u>
2	"Separate DW N <sub>2</sub> supply piping from CAD and DW makeup flow paths."
3	"Install Incipient Detection to monitor the electrical panels in each units Auxiliary Instrument Room."
9c	"Modify the valve control circuit to lower the probability of spurious operation of 2-FCV-074-0057 and 2-FCV-074-0060."
11	"Add fuses in battery board ammeters."
14	"Enclose normal DC Power cable to 4kV Shutdown Board 3EA in an ERFBS in Fire Areas 12 and 23."
15	"Remove motor operators for 0-FCV-067-0048 and 0-FCV-067-0049 (EECW/RHRSW cross-tie valve) to prevent spurious operation."
16	"Eliminate EECW swing pump limit switch functions from the RHRSW swing pumps."
17	"Enclose the normal feeder cables to the 480V RMOV Board 3B in an ERFBS in Fire Area 13."
19	"Re-route RCIC cable out of Fire Area 17 (Battery Board Room 1)."
23	"Remove the 120V lighting circuits from the RPS panels."
33a	"For each RHR LPCI injection valve (FCV 74-53 and FCV 74-67), install a switch in the MCR to allow bypass of the low pressure interlock."
33b	"For each RHR LPCI injection valve (FCV 74-53 and FCV 74-67), install a switch in the MCR to allow the inhibit function of the shutdown cooling logic auto-close interlock relay."
39	"Re-route 250V DC backup SCRAM cables in separate raceway from 120V SDV drain valve cables in RPS system."
40	"Abandon LPCI MG sets for 480V RMOV Boards 3D and 3E including re-route of cables."
44	"Abandon LPCI MG sets for 480V RMOV Boards 2D and 2E including re-route of cables."
58	"Re-route control cable 3PP907 (breaker 1334 control) out of FA 21."
73	"Re-route control cables 3PP905-IA and 3PP907 away from Fire Area 03-03."
76	"Install separate emergency control power fuses in 480V Shutdown Board NORM and ALT feeder breakers."
80	"Replace fuses with slugs in the neutral for ECCS inverter power supply to Panel 25-32."

Therefore, TVA has deleted the above listed modification items from Table S-2, as reflected in the retyped Table S-2 provided in Enclosure 6 to this letter.

## **Changes to Modification Items in Table S-2**

In addition to deleting completed modification items from Table S-2, TVA has revised or deleted the following modification items. The proposed changes are reflected in the retyped Table S-2 provided in Enclosure 6 to this letter.

### **Modification Item 8**

#### Description of Modification Item:

"Install (8 total) interposing relays to isolate 4kV Shutdown Board breaker control circuits from spurious closure signals."

#### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 8 is revised to "Install (6 total) interposing relays to isolate 4kV Shutdown Board breaker control circuits from spurious closure due to fire damage to cables associated with lockout relays 86-1 and 86-2."

#### Justification:

The modification description is clarified to be more specific about the failure being addressed. There are 8 circuit breakers of concern that interface with lockout relays 86-1 and 86-2. However, two of the breakers are located in the same switchgear as the associated lockout relay with no external cables. Therefore two circuit breakers do not require installation of a lockout relay. The intent of the modification is not changed.

#### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

#### Estimated Probabilistic Risk Impact:

The intent of the modification not changed. Therefore, there is no impact on risk.

## **Modification Item 13**

### Description of Modification Item:

"Install interposing relays (4 total) to isolate 4kV Shutdown Board crosstie breaker control circuits from spurious closure signals."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 13 is revised to "Install interposing relays (4 total) to isolate 4kV Shutdown Board crosstie breaker control circuits from spurious closure due to fire damage to cables associated with lockout relays 86-SCA, 86-SCB, 86-SCC and 86-SCD."

### Justification:

The modification description is clarified to be more specific about the failure being addressed. The modification is not changed.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

The modification is only clarified. Therefore, there is no impact on risk.

## **Modification Item 18**

### Description of Modification Item:

"Install interposing relays (8 total) to isolate the 4kV Shutdown Board DG breaker control circuits from spurious closure signals."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 18 is revised to "Install interposing relays (8 total) to isolate the 4kV Shutdown Board DG breaker control circuits from spurious closure due to fire damage to cables associated with lockout relays 86-GA, 86-GB, 86-GC, 86-GD, 86-G3A, 86-G3B, 86-G3C, and 86-G3D."

### Justification:

The modification description is clarified to be more specific about the failure being addressed. The modification is not changed.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

The modification is only clarified. Therefore, there is no impact on risk.

## **Modification Item 24**

### Description of Modification Item:

"Install additional fusing for trip circuits on all 4kV Shutdown Board load breakers and on non-safety 4kV load breakers transitioning fire areas."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 24 is revised to "Install separate fuses for trip circuits extending outside the switchgear on all 4kV Shutdown Board load breakers and on non-safety 4kV load breakers transitioning fire areas."

### Justification:

The modification description is clarified to better describe the modification.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

The modification is only clarified. Therefore, there is no impact on risk.

### **Modification Item 30**

#### Description of Modification Item:

"Install coordinated fuses to prevent loss of protective relaying for the eight safety related on-site Diesel Generators."

#### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 30 is revised to "Install separate fuses for circuits extending outside of the Diesel Generator compartments to prevent loss of protective relaying for the eight safety related on-site Diesel Generators for fires external to the Diesel Generator compartments."

#### Justification:

The modification description is clarified to better describe the modification.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

#### Estimated Probabilistic Risk Impact:

The modification is only clarified. Therefore, there is no impact on risk.



## **Modification Item 35a**

### **Description of Modification Item:**

"Install adequate on-site Diesel Generator capacity to simultaneously run the three emergency high pressure makeup pumps (one per unit)."

### **Description of Revision to Modification Item:**

LAR, Attachment S, Table S-2, Item 35a is revised to "Install adequate on-site Diesel Generator capacity to simultaneously run the three emergency high pressure makeup pumps (one per unit). Additionally, remove the hydrogen trailer port and the hydrogen system piping from this location."

In addition, the Problem Statement and Associated VFDRs discussion are revised for consistency with the proposed modification change. The Problem Statement is revised from "An additional power source for the emergency high pressure makeup pump is needed to improve baseline CDF," to "An additional power source for the emergency high pressure makeup pump is needed to improve baseline CDF. In addition, resolve the need for explosion proof fixtures at the hydrogen trailer port facility."

The Associated VFDRs description is revised from "Risk reduction modification not associated with a specific VFDR," to "Risk reduction modification not associated with a specific VFDR. Associated NFPA 805 Chapter 3 references: 3.3.1.2 (6), 3.3.7, 3.3.7.1, 3.3.7.2"

### **Justification:**

The hydrogen trailer port is the secondary source for hydrogen gas used in the Hydrogen Water Chemistry and Generator Hydrogen systems; however, this source is no longer used. A "hydrogen tank farm" located approximately 1/4 mile east of the plant is the primary source for hydrogen used in the plant, and no noncompliances with the tank farm were identified in the NFPA 50A Code Compliance Evaluation.

The Code Compliance Evaluation found that explosion-proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 will preclude the need for explosion proof electrical fixtures by demolishing the hydrogen trailer port and removing the hydrogen system piping (i.e., the explosion hazard) from this location.

### **Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:**

LAR, Attachment A, NFPA 805 Chapter 3 Reference 3.3.1.2 Control of Combustible Materials (6), Compliance Basis, Item for Implementation is revised from "Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation item 36 in Table S-3 of Attachment S," to "The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion-proof lighting."

LAR, Attachment A, NFPA 805 Chapter 3 Reference 3.3.7.1 (Bulk Flammable Gas Location Requirements), Compliance Basis, Item for Implementation is revised from "Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation item 36 in Table S-3 of Attachment S," to "The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion-proof lighting."

Estimated Probabilistic Risk Impact:

The change in implementation action for the hydrogen trailer port facility is an NFPA 805 Chapter 3 compliance modification. This level of detail is not modeled in the PRA. Therefore, there is no impact on risk.

## **Modification Item 38**

### Description of Modification Item:

"Modify the control circuits of valves FCV 73-34, FCV 73-35 and FCV 73-44 for all 3 Units to prevent spurious operation."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 38 is revised to "Modify the control circuits of valves FCV 73-34, FCV 73-35 and FCV 73-44 for all 3 Units to reduce the probability of spurious operation."

In addition, the "Risk Informed Characterization," statement is revised from "Risk is reduced by preventing a possible unacceptable voltage drop on the batteries," to "Risk is reduced by reducing the probability of a possible unacceptable voltage drop on the batteries."

### Justification:

The basis for Modification Item 38 is to address potential overload of station batteries due to spurious operation of large motor-operated valve (MOV) loads. The modification is designed to prevent spurious operation due to cable damage but will not deterministically prevent spurious operation of the valve for fires directly impacting the motor control center (MCC) compartment or the main control room (MCR) control switch for each valve. This method of addressing spurious valve operation is used with Table S-2 Modification Items 9a, 9b, 9c, 9d, 9e, 9f, and 54, and is described in the TVA response to NRC Request for Additional Information (RAI) for Safe Shutdown Analysis (SSA) RAI 12 in TVA letter dated December 20, 2013.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

Failure of batteries due to overload was not initially modeled in the Nuclear Safety Capability Analysis (NSCA). As part of the periodic Probabilistic Risk Assessment (PRA) update, new VFDRs may be required to track battery overload.

### Estimated Probabilistic Risk Impact:

The risk evaluation supporting the LAR did not model the impact of battery overload due to spurious operation of these valves. Appropriate failure sequences will be added to the Fire PRA model along with analysis refinements to better model the risk impact of this failure mode. The modification has been designed and has been implemented on Unit 2. TVA does not anticipate the need to change the modification. In accordance with LAR, Attachment S, Table S-3, Item 32, the Fire PRA model will be updated to reflect the as built configuration and TVA will verify that the RG 1.174 acceptance criteria are met.

### **Modification Item 43**

#### Description of Modification Item:

"Re-route cable 0PP285 associated with Shutdown Bus 2 normal feeder breaker 1722 away from Fire Area 02-01."

#### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 43 is revised to "Provide separation in Fire Area 02-01 for cable 0PP285 associated with Shutdown Bus 2 normal feeder breaker 1722."

#### Justification:

The intent of the modification is to protect the cable from fire damage in Fire Area 02-01. The modification is not fully developed and therefore the description is being generalized to reflect the intent. Also the modification is revised to allow the option to use other approaches such as ERFBS.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

#### Estimated Probabilistic Risk Impact:

TVA anticipates a small variation in risk results depending upon the method of cable protection.

## **Modification Item 52a**

### Description of Modification Item:

"For Drywell wide range pressure instruments P-64-160A and B and Suppression Pool wide range level instruments L-64-159A and B, provide isolation of associated circuits and make appropriate power supply available such that both division instruments are not lost in the same fire scenario."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 52a is revised to "For Drywell wide range pressure instruments P-64-160A and B provide isolation of associated circuits and make appropriate power supply available such that both division instruments are not lost in the same fire scenario."

In addition, the "Problem Statement" and "Risk Informed Characterization" statements are revised to conform to the proposed modification change. The "Problem Statement" is revised from "Containment pressure and suppression pool level indications are required in all fire areas to support decay heat removal through the HWWV. Cables and power supplies for redundant instrument loops may be damaged by the same fire scenario," to "Containment pressure indication is required in all fire areas to support decay heat removal through the HWWV. Cables and power supplies for redundant instrument loops may be damaged by the same fire scenario."

The "Risk Informed Characterization" is revised from "Reduces risk by allowing additional redundancy of drywell pressure and suppression pool level for indication to support decay heat removal via the HWWV," to "Reduces risk by allowing additional redundancy of drywell pressure for indication to support decay heat removal via the HWWV."

### Justification:

The basis for this modification is to ensure that adequate instrumentation is available to support containment venting with the hardened wet well vent (HWWV). TVA does not plan to require indication of suppression pool level in the fire safe shutdown procedures when utilizing the hardened wet well vent (HWWV) in fire safe shutdown events. Therefore, modification of the suppression pool level instrumentation is not required.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

Changes in PRA modeling will be required to remove the dependency of HWWV on Suppression Pool level indication. Suppression Pool level indication will still be credited for other functions. Therefore, TVA expects this change to result in an insignificant increase in risk.

## **Modification Item 52b**

### Description of Modification Item:

"Provide containment pressure and suppression pool level indication on the Backup Control Panel."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 52b is revised to "Provide containment pressure indication on the Backup Control Panel."

In addition, the "Problem Statement" and "Risk Informed Characterization," statements are revised to conform to the proposed modification change. The "Problem Statement" is revised from "Containment pressure and suppression pool level indications are required for control room abandonment to support decay heat removal through the HWWV," to "Containment pressure indication is required for control room abandonment to support decay heat removal through the HWWV."

The "Risk Informed Characterization" is revised from "Reduces risk by allowing additional redundancy of drywell pressure and suppression pool level for indication to support decay heat removal via the HWWV," to "Reduces risk by allowing additional redundancy of drywell pressure for indication to support decay heat removal via the HWWV."

### Justification:

The basis for this modification is to ensure that adequate instrumentation is available to support containment venting with the hardened wet well vent (HWWV). TVA does not plan to require indication of suppression pool level in the fire safe shutdown procedures when utilizing the HWWV in fire safe shutdown events. Therefore, modification of the suppression pool level instrumentation is not required.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

Changes in PRA modeling will be required to remove the dependency of HWWV on Suppression Pool level indication. Suppression Pool level indication will still be credited for other functions. Therefore, TVA expects this change to result in an insignificant increase in risk.

## **Modification Item 52c**

### Description of Modification Item:

"Re-route cables as required for Drywell wide range pressure instruments P-64-160A and B and Suppression Pool wide range level L-64-159A and B."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 52c is revised to "Re-route cables as required to provide drywell pressure indication in the MCR."

In addition, the "Problem Statement" and "Risk Informed Characterization," statements are revised to conform to the proposed modification change. The "Problem Statement" is revised from "Containment pressure and suppression pool level indications are required in all fire areas to support decay heat removal through the HWWV. Cables and power supplies for redundant instrument loops may be damaged by the same fire scenario," to "Containment pressure indication is required in all fire areas to support decay heat removal through the HWWV. Cables and power supplies for redundant instrument loops may be damaged by the same fire scenario."

The "Risk Informed Characterization" is revised from "Reduces risk by allowing additional redundancy of drywell pressure and suppression pool level for indication to support decay heat removal via the HWWV," to "Reduces risk by allowing additional redundancy of drywell pressure for indication to support decay heat removal via the HWWV."

### Justification:

The basis for this modification is to ensure that adequate instrumentation is available to support containment venting with the hardened wet well vent (HWWV). TVA does not plan to require indication of suppression pool level in the fire safe shutdown procedures when utilizing the HWWV in fire safe shutdown events. Therefore, modification of the suppression pool level instrumentation is not required.

Other drywell pressure loops in addition to P-64-160A and B are available with sufficient range to support HWWV operation and therefore the modification solution is not limited to drywell pressure loops P-64-160A and B.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

Changes in PRA modeling will be required to remove the dependency of HWWV on Suppression Pool level indication. Suppression Pool level indication will still be credited for other functions. Therefore, TVA expects this change to result in an insignificant increase in risk.

## **Modification Item 57**

### Description of Modification Item:

"Enclose in ERFBS and re-route cable ES2691-II (RHR Pump 2D control cables) out of Fire Areas 02-03 and 02-04 to prevent spurious start."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 57 is revised to "Provide separation in Fire Areas 02-03 and 02-04 for cable ES2691-II (RHR Pump 2D control cable) to prevent spurious start."

### Justification:

The intent of the modification is to protect the cable from fire damage in Fire Areas 02-03 and 02-04. The modification is not fully developed and therefore the description is being generalized to reflect the intent.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

TVA anticipates a small variation in risk results depending upon the method of cable protection.



## **Modification Item 60**

### Description of Modification Item:

"Modify the control circuit for Bus Tie breakers 1642 and 1742 to prevent spurious closure."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 60 is revised to "Modify the control circuit for Bus Tie breakers 1642 and 1742 to prevent spurious closure from circuits extending outside of the switchgear."

### Justification:

The modification description is clarified to better describe the modification.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

The modification is only clarified. Therefore, there is no impact on risk.

## **Modification Item 69**

### Description of Modification Item:

"Re-route control cable 3ES1571-I for RHR Pump 3C away from Fire Area 03-02."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 69 is revised to "Provide separation for cable 3ES1571-I (RHR Pump 3C control cable) in Fire Area 03-02 to prevent spurious start."

### Justification:

The intent of the modification is to protect the cable from fire damage in Fire Area 03-02. The modification is not fully developed and therefore the description is being generalized to reflect the intent. Also the modification is revised to allow the option to use other approaches such as ERFBS.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

TVA anticipates a small variation in risk results depending upon the method of cable protection.

## **Modification Item 84**

### Description of Modification Item:

"Reduce the overcurrent settings for 4kV Shutdown Bus feeder breakers to protect Shutdown Bus from overload.

- Breaker 1126
- Breaker 1226
- Breaker 1132
- Breaker 1232"

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 84 is revised to "Provide overload protection for 4kV Shutdown Bus feeder breakers.

- Breaker 1126
- Breaker 1226
- Breaker 1132
- Breaker 1232"

### Justification:

The revised modification description continues to protect the subject 4kV Shutdown Buses from overload while allowing other methods of protection to be implemented.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This clarification requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

This change maintains the intent of the modification. Therefore, there is no impact on risk.

## **Modification Item 90**

### Description of Modification Item:

"Install a shorting/disconnect switch in the MCR to prevent spurious opening of valves PC 69-15 for all 3 Units during power operation."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2, Item 90 is revised to "Install a shorting/disconnect switch in the MCR to reduce the probability of spurious opening of valves PCV 69-15 for all 3 Units during power operation."

### Justification:

The modification description is revised to allow the use of a performance based approach which reduces the probability of failure but may not prevent failure.

Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

This change requires no other changes to the LAR.

### Estimated Probabilistic Risk Impact:

This change maintains the intent of the modification. Therefore, there is no impact on risk.

## **Modification Item 93**

### Description of Modification Item:

"Install a modification to allow operators to isolate control air to the individual reactor buildings."

### Description of Revision to Modification Item:

LAR, Attachment S, Table S-2 is revised to delete Modification Item 93.

### Justification:

This modification originally addressed two fire related failures.

1. Failure of containment isolation valves to close impacting Large Early Release Fraction (LERF)

During review of this modification TVA determined that some of the containment isolation valves that must be closed to address LERF have a backup pneumatic supply from the Containment Air Dilution system, that has the potential to defeat the originally intended operator action to isolate control air. As a result, the operator actions will be eliminated and further fire modeling and risk evaluation will be used to achieve acceptable LERF values. Modification 93, which was to facilitate the planned operator action, is no longer needed.

2. Failure of the Scram Discharge Volume Vent and Drain Valves to close impacting Core Damage Frequency (CDF).

The principal risk contributor to this failure was a cable separation issue that was corrected by installation of Modification Item 39, which separated Scram Discharge Volume and Backup SCRAM cables into different conduits. The CDF goals were achieved by installing Modification Item 39, without the need to isolate control air.

### Variance from Deterministic Requirements (VFDR), Recovery Action, and LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Changes:

The associated LAR, Attachment G, "Recovery Actions Transition," Table G-1, "Recovery Actions and Activities Occurring at the Primary Control Station(s)," Recovery Action ID Risk-RA 16-0092 in Fire Area 16 is deleted.

### Estimated Probabilistic Risk Impact:

Additional modeling changes will be made to address elimination of the recovery action. A sensitivity analysis has been performed and shows that this modification can be deleted while still meeting the RG 1.174 acceptance criteria.

### **Changes to Implementation Items in Table S-3**

LAR, Attachment S, Table S-3, "Implementation Items," provided the list of committed implementation items associated with implementing NFPA 805. As a result of continuing reviews and implementation of the implementation items, TVA has revised or deleted the following implementation items. The proposed changes are reflected in the retyped Table S-3 provided in Enclosure 5 to this letter.

#### **Item 3**

##### **Description of Implementation Item:**

"The monitoring program required by NFPA 805 Section 2.6 will be implemented after the LAR approval as part of the fire protection program transition to NFPA 805, in accordance with NFPA 805 FAQ 10-0059, and will include a process that reviews fire protection performance and trends in performance. Program specifics are provided in LAR Section 4.6.2."

##### **Description of Revision to Implementation Item:**

LAR, Attachment S, Table S-3, Item 3 is revised to "The monitoring program required by NFPA 805 Section 2.6 will be implemented as part of the fire protection program transition to NFPA 805, in accordance with NFPA 805 FAQ 10-0059, and will include a process that reviews fire protection performance and trends in performance. Program specifics are provided in LAR Section 4.6.2."

##### **Justification:**

The intent of this change is to eliminate issuance of the SE as a restraint to implementing NFPA 805 Monitoring procedures.

#### **Item 7**

##### **Description of Implementation Item:**

"Revise appropriate procedures to inspect and ensure guides and bearings of sliding fire doors are maintained well lubricated."

##### **Description of Revision to Implementation Item:**

LAR, Attachment S, Table S-3, Item 7 is revised to "Revise appropriate procedures to inspect and ensure guides and bearings of active NFPA 805 required sliding fire doors are maintained well lubricated."

##### **Justification:**

This text clarifies that changes will be made for NFPA 805 required doors only. There are other sliding doors at BFN that are not required per the NFPA 805 program. Additionally, some NFPA 805 required sliding doors are bolted in place and are not active. Maintaining door bearings on non active doors is not practical.

**Item 17, 2nd bullet**Description of Implementation Item:

"Conduct test measurements of the fire pumps against the rated capacity (2,500 gpm at 130 psig). Based on the findings, evaluate the overall health of the pump."

Description of Revision to Implementation Item:

LAR, Attachment S, Table S-3, Item 17, 2nd bullet is deleted.

Justification:

BFN currently tests fire pumps to meet system demand requirements of 2,250 gpm at 130 psig vs. the original fire pump rated capacity of 2,500 gpm at 130 psig, and trends data as part of its evaluation and monitoring of system health. The 2,250 gpm at 130 psig test criteria is supported by an engineering evaluation and, with testing, ensures that a single pump can supply the largest fire system flow demand plus margin. Pump testing is performed at a variety of flows and pressures so pump performance can be evaluated.

**Item 19, 1st bullet**Description of Implementation Item:

"Revise the fire alarm procedures to include retention of fire alarm signals received for at least one year."

Description of Revision to Implementation Item:

LAR, Attachment S, Table S-3, Item 19 (1st bullet) is revised to "Revise the applicable procedure to include retention of fire alarm signals received for at least one year."

Justification:

This requirement will be located in a procedure that defines Fire Operations responsibilities and will not be located in a fire alarm procedure.

## **Item 19, 3rd bullet**

### Description of Implementation Item:

"Update Procedures 0-SI-4.11.A.1(1), 0-SI-4.11.A.1(2), 0-SI-4.11.A.1(3)a, 0-SI-4.11.A.1(3)b, 0-SI-4.11.A.1(4), 1-SI-4.11.A.1(1), 2-SI-4.11.A.1(1), 2-SI-4.11.A.1(2), 2-SI-4.11.A.1(3), 3-SI-4.11.A.1(1), 3-SI-4.11.A.1(2), 3-SI-4.11.A.1(3), and 3-SI 4.11.A.1(4) to exclude test magnets from being used during smoke detector testing and to ensure smoke detectors are tested and activated using chemical smoke designed solely for smoke detector testing."

### Description of Revision to Implementation Item:

LAR, Attachment S, Table S-3, Item 19, 3rd bullet, is revised to "Update applicable testing procedures to exclude test magnets from being used during smoke detector testing and to ensure smoke detectors are tested and activated using chemical smoke designed solely for smoke detector testing."

### Justification:

The existing list of procedures provided in Implementation Item 19, Bullet 3, contains procedures that do not require change. Significant changes in testing procedures are being made to implement NFPA 805. The proposed text allows flexibility to combine, rename, or create new testing procedures, as necessary.

## **Item 35**

### Description of Implementation Item:

"Revise NPG-SPP-18.4.7 to establish limits on the types and quantities of materials in designated permanent storage areas."

### Description of Revision to Implementation Item:

LAR, Attachment S, Table S-3, Item 35 is revised to "Revise NPG-SPP-18.4.7 to establish limits on the types and quantities of materials in designated storage areas."

### Justification:

The current Implementation Item identifies a change to NPG-SPP-18.4.7, "Control of Transient Combustibles." However, NPG-SPP-18.4.7 does not address permanent storage. Permanent storage is addressed via the design change process/controls. The origin of the Implementation Item comes from LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," Section 3.3.1.2 Control of Combustible Materials (4), that discusses storage and staging of combustible materials and does not use the term "permanent." Limits on the types and quantities of transient combustible materials being stored and staged are being incorporated into NPG-SPP-18.4.7. The proposed change is consistent with the Compliance Basis for Section 3.3.1.2 Control of Combustible Materials (4).



## Item 36

### Description of Implementation Item:

"Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility."

### Description of Revision to Implementation Item:

LAR, Attachment S, Table S-3, Item 36 is deleted.

### Justification:

The hydrogen trailer port is the secondary source for hydrogen gas used in the Hydrogen Water Chemistry and Generator Hydrogen systems; however, this source is no longer used. A "hydrogen tank farm" located approximately 1/4 mile east of the plant is the primary source for hydrogen used in the plant, and no noncompliances with the tank farm were identified in the NFPA 805 Code Compliance Evaluation.

The Code Compliance Evaluation found that explosion-proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will preclude the need for explosion proof electrical fixtures by demolishing the hydrogen trailer port and removing the hydrogen system piping (i.e., the explosion hazard) from this location.

Use and storage of hydrogen gas is discussed in LAR, Attachment A, "NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements," NFPA 805 Chapter 3 References 3.3.1.2 Control of Combustible Materials (6), 3.3.7 Bulk Flammable Gas Storage, 3.3.7.1 Bulk Flammable Gas Location Requirements, and 3.3.7.2 Bulk Flammable Gas Container Restrictions.

### Related Changes:

LAR, Attachment A, NFPA 805 Chapter 3 Reference 3.3.1.2 Control of Combustible Materials (6), Compliance Basis, Item for Implementation is revised from "Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation item 36 in Table S-3 of Attachment S," to "The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion proof electrical fixtures."

LAR, Attachment A, NFPA 805 Chapter 3 Reference 3.3.7.1 (Bulk Flammable Gas Location Requirements), Compliance Basis, Item for Implementation is revised from "Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation item 36 in Table S-3 of Attachment S," to "The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion proof electrical fixtures."

Enclosure 5 to this letter provides marked up pages showing the changes described above for LAR, Attachment A.

**ENCLOSURE 3**

**Tennessee Valley Authority  
Browns Ferry Nuclear Plant, Units 1, 2, and 3**

**License Amendment Request, Attachment A, "NEI 04-02 Table B-1 Transition of  
Fundamental Fire Protection Program & Design Elements," Markup Pages**

(3 pages including cover)

## Attachment A

### NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements

NFPA 805 Ch. 3 Reference	Requirements / Guidance	Compliance Statement	Compliance Basis
<b>References</b>	<b>Document ID</b> NPG-SPP-18.4.7 Rev. 2 [Sections 3.2.1 and 3.2.2] - Control of Transient Combustibles		
3.3.1.2 Control of Combustible Materials. (5)	3.3.1.2 (5) * Controls on use and storage of flammable and combustible liquids shall be in accordance with NFPA 30, Flammable and Combustible Liquids Code, or other applicable NFPA standards.	Complies	The controls on the use and storage of flammable and combustible liquids at BFN are in accordance with NFPA 30.  No other NFPA Standards were determined to be applicable based on guidance in FAQ 06-0020.
<b>References</b>	<b>Document ID</b> MDQ099920100013 Rev. 0 [All] - NFPA-30 Code Compliance Evaluation		
3.3.1.2 Control of Combustible Materials. (6)	3.3.1.2 (6) * Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards.	Complies with Use of EEEEs	NPG-SPP-18.4.7 provides controls for the staging and storage of flammable gases.  The use and storage of hydrogen gases at BFN is evaluated to be in compliance with NFPA 50A - 1984 Edition as shown in the referenced Code Compliance Evaluation. Corrective actions were required for code non-compliances identified in the evaluation.  No other NFPA Standards were determined to be applicable based on guidance in FAQ 06-0020.  Item for Implementation: <span style="border: 1px solid red; padding: 2px;">June 19, 2015, letter</span>
<b>References</b>	<b>Document ID</b> MDQ099920100014 Rev. 1 [All] - NFPA-50A Code Compliance Evaluation NPG-SPP-18.4.7 Rev. 2 [Sections 3.2.1 and 3.2.2] - Control of Transient Combustibles		
3.3.1.3 Control of Ignition Sources.	3.3.1.3 Control of Ignition Sources.	N/A	Section Heading.
3.3.1.3.1 [Control of Ignition Sources Code Requirements]	3.3.1.3.1* A hot work safety procedure shall be developed, implemented, and periodically updated as necessary in accordance with NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, and NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.	Complies with Use of EEEEs	A procedure to control ignition sources (NPG-SPP-18.4.8) has been developed to protect plant equipment, structures, and personnel from fires resulting from work performed outside of designated shop areas involving ignition sources. NPG-SPP-18.4.8 cites NFPA 51B as a developmental reference document.  Compliance with NFPA 241 is addressed through compliance with NFPA 51B. Compliance with NFPA 51B - 1999 Edition is shown in the referenced Code Compliance Evaluation. NFPA 241, 2000 edition, as referenced by NFPA 805-2001 ed., Section 5.1.1, with respect to hot work, states "Responsibility for hot work operations and fire prevention precautions, including permits and fire watches, shall be in accordance

The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion proof electrical fixtures.

Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation Item 36 in Table S-3 of Attachment S.

## Attachment A

### NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program & Design Elements

NFPA 805 Ch. 3 Reference	Requirements / Guidance	Compliance Statement	Compliance Basis
3.3.7 Bulk Flammable Gas Storage.	3.3.7 Bulk Flammable Gas Storage. Bulk compressed or cryogenic flammable gas storage shall not be permitted inside structures housing systems, equipment, or components important to nuclear safety.	Complies	<p>The primary hydrogen storage location is approximately 1/4 mile east of the main plant buildings. Hydrogen is also stored in two truck trailers located over 100 feet from the Turbine Building and over 250 feet from the nearest corner of the Reactor Building.</p> <p>Flammable gas storage is not permitted inside structures, housing systems, equipment, or components important to nuclear safety. The transient combustible program and the Fire Hazard Analysis does not allow bulk storage of flammable gas within the powerhouse proper.</p> <p>Item for Implementation:</p> <p>Develop specific guidance and restrictions on bulk flammable gas storage on site. See Implementation Item 38 in Table S-3 of Attachment S.</p>
References	Document ID		
	0-FPR-VOLUME 1/PART 1 Rev. 14 [Section 4.4.6] - Fire Protection Plan 0-FPR-VOLUME 1/PART 2 Rev. 14 [Section 6.0] - The Fire Protection Report, Fire Hazards Analysis NPG-SPP-18.4.7 Rev. 2 - Control of Transient Combustibles		
3.3.7.1 [Bulk Flammable Gas Location Requirements]	3.3.7.1 Storage of flammable gas shall be located outdoors, or in separate detached buildings, so that a fire or explosion will not adversely impact systems, equipment, or components important to nuclear safety. NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites, shall be followed for hydrogen storage.	Complies with Use of EEEEs	<p>The primary hydrogen storage location is approximately 1/4 mile east of the main plant buildings. Hydrogen is also stored in two truck trailers located over 100 feet from the Turbine Building and over 250 feet from the nearest corner of the Reactor Building. The fire protection plan states "The bulk supply of hydrogen at BFN is stored in trailers located in a trailer port constructed of reinforced concrete and steel, located over 100 feet from the Turbine Building and over 250 feet from the nearest corner of the Reactor Building. The trailer port contains two individual trailer bays, each enclosing one trailer on three sides with the open end facing away from the main plant."</p> <p>The outdoor hydrogen storage at BFN is evaluated to be in compliance with NFPA 50A - 1984 Edition as shown in the referenced Code Compliance Evaluation. Corrective actions were required for code non-compliances identified in the evaluation.</p> <p>Item for Implementation:</p> <p>Develop specific guidance and restrictions on bulk flammable gas storage on site. See Implementation Item 38 in Table S-3 of Attachment S.</p> <p>Item for Implementation:</p>
	<div style="border: 1px solid red; padding: 5px;">           The Code Compliance Evaluation found that explosion proof lighting is not installed at the hydrogen trailer port. Modification 35a in Table S-2 of Attachment S will demolish the hydrogen trailer port and remove the hydrogen system piping from this location, removing the explosion hazard from the area and precluding the need for explosion proof electrical fixtures.         </div>		<div style="border: 1px solid red; padding: 5px; margin-top: 10px;"> <p>Implement WO 1132433146 to install explosion proof electrical fixtures in the Hydrogen Trailer Port Facility. See Implementation Item 36 in Table S-3 of Attachment S.</p> </div>

June 19, 2015, letter

**ENCLOSURE 4**

**Tennessee Valley Authority  
Browns Ferry Nuclear Plant, Units 1, 2, and 3**

**Updated NFPA 805 License Amendment Request, Attachment M,  
"License Condition Changes," Retyped Renewed Facility Operating License Pages**

**(11 pages including cover)**

- (8) Deleted.
- (9) Deleted.
- (10) Deleted.
- (11)(a) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 279, as amended by changes approved by License Amendment No. 286.
- (12) Deleted.
- (13) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment request dated March 27, 2013 as supplemented by letters dated May 16, 2013, December 20, 2013, January 10, 2014, January 14, 2014, February 13, 2014, March 14, 2014, May 30, 2014, June 13, 2014, July 10, 2014, August 29, 2014, September 16, 2014, October 6, 2014, December 17, 2014, March 26, 2015, April 9, 2015, and June 19, 2015, as approved in the safety evaluation report dated \_\_\_\_\_. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

#### **Risk-Informed Changes that May Be Made Without Prior NRC Approval**

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than  $1 \times 10^{-7}$ /year (yr) for CDF and less than  $1 \times 10^{-8}$ /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

### **Other Changes that May Be Made Without Prior NRC Approval**

#### **1. Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program.**

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or adequate for the hazard. The licensee may use an engineering evaluation to demonstrate that a change to an NFPA 805, Chapter 3 element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3 elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is adequate for the hazard. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- Fire Alarm and Detection Systems (Section 3.8);
- Automatic and Manual Water-Based Fire Suppression Systems (Section 3.9);
- Gaseous Fire Suppression Systems (Section 3.10); and
- Passive Fire Protection Features (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation report dated \_\_\_\_\_ to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

**Transition License Conditions**

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
  2. The licensee shall implement the following modifications to its facility, as described in Table S-2, "Plant Modifications," of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2015, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the license amendment. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
  3. The licensee shall complete the implementation items as listed in Table S-3, "Implementation Items," of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2015, within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage, then implementation will occur within 60 days after startup from that scheduled refueling outage. Implementation items 32 and 33 are associated with modifications and will be completed after all procedure updates, modifications, and training are complete.
- 
- (14) The licensee shall maintain the Augmented Quality Program for the Standby Liquid Control System to provide quality control elements to ensure component reliability for the required alternative source term function defined in the Updated Final Safety Analyses Report (UFSAR).
  - (15) The licensee is required to confirm that the conclusions made in TVA's letter dated September 17, 2004, for the turbine building remain acceptable using seismic demand accelerations based on dynamic seismic analysis prior to the restart of Unit 1.
  - (16) Upon implementation of Amendment No. 275, adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air leakage as required by SR 3.7.3.4, in accordance with TS 5.5.13.c (i), the assessment of the CRE habitability as required by TS 5.5.1.13.c(ii), and the measure of CRE pressure as required by TS 5.5.13.d, shall be considered met.



- (8) Deleted.
- (9) Deleted.
- (10) Deleted.
- (11)(a) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 306, as amended by changes approved by License Amendment 312.
- (12) Deleted.
- (13) Deleted.
- (14) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment request dated March 27, 2013 as supplemented by letters dated May 16, 2013, December 20, 2013, January 10, 2014, January 14, 2014, February 13, 2014, March 14, 2014, May 30, 2014, June 13, 2014, July 10, 2014, August 29, 2014, September 16, 2014, October 6, 2014, December 17, 2014, March 26, 2015, April 9, 2015, and June 19, 2015, as approved in the safety evaluation report dated \_\_\_\_\_. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

### **Risk-Informed Changes that May Be Made Without Prior NRC Approval**

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be

acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than  $1 \times 10^{-7}$ /year (yr) for CDF and less than  $1 \times 10^{-8}$ /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

#### **Other Changes that May Be Made Without Prior NRC Approval**

1. Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program.

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or adequate for the hazard. The licensee may use an engineering evaluation to demonstrate that a change to an NFPA 805, Chapter 3 element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3 elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is adequate for the hazard. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- Fire Alarm and Detection Systems (Section 3.8);
- Automatic and Manual Water-Based Fire Suppression Systems (Section 3.9);
- Gaseous Fire Suppression Systems (Section 3.10); and
- Passive Fire Protection Features (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation report dated \_\_\_\_\_ to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program

**Transition License Conditions**

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
  2. The licensee shall implement the following modifications to its facility, as described in Table S-2, "Plant Modifications," of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2015, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the license amendment. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
  3. The licensee shall complete the implementation items as listed in Table S-3, "Implementation Items," of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2019, within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage, then implementation will occur within 60 days after startup from that scheduled refueling outage. Implementation items 32 and 33 are associated with modifications and will be completed after all procedure updates, modifications, and training are complete.
- (15) The licensee shall maintain the Augmented Quality Program for the Standby Liquid Control System to provide quality control elements to ensure component reliability for the required alternative source term function defined in the Updated Final Safety Analyses Report (UFSAR).

- (3) The licensee is authorized to relocate certain requirements included in Appendix A and the former Appendix B to licensee-controlled documents. Implementation of this amendment shall include the relocation of these requirements to the appropriate documents, as described in the licensee's application dated September 6, 1996; as supplemented May 1, August 14, November 5 and 14, December 3, 4, 11, 22, 23, 29, and 30, 1997; January 23, March 12, April 16, 20, and 28, May 7, 14, 19, and 27, and June 2, 5, 10 and 19, 1998; evaluated in the NRC staff's Safety Evaluation enclosed with this amendment. This amendment is effective immediately and shall be implemented within 90 days of the date of this amendment.
- (4) Deleted.
- (5) Classroom and simulator training on all power uprate related changes that affect operator performance will be conducted prior to operating at uprated conditions. Simulator changes that are consistent with power uprate conditions will be made and simulator fidelity will be validated in accordance with ANSI/ANS 3.5-1985. Training and the plant simulator will be modified, as necessary, to incorporate changes identified during startup testing. This amendment is effective immediately.
- (6)(a) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," Revision 4, submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 265, as amended by changes approved by License Amendment No. 271.
- (7) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment request dated March 27, 2013 as supplemented by letters dated May 16, 2013, December 20, 2013, January 10, 2014, January 14, 2014, February 13, 2014, March 14, 2014, May 30, 2014, June 13, 2014, July 10, 2014, August 29, 2014, September 16, 2014, October 6, 2014, December 17, 2014, March 26, 2015, April 9, 2015, and June 19, 2015, as approved in the safety evaluation report dated \_\_\_\_\_. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior

NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

#### **Risk-Informed Changes that May Be Made Without Prior NRC Approval**

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than  $1 \times 10^{-7}$ /year (yr) for CDF and less than  $1 \times 10^{-8}$ /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

#### **Other Changes that May Be Made Without Prior NRC Approval**

1. Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program.

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or adequate for the hazard. The licensee may use an engineering evaluation to demonstrate that a change to an NFPA 805, Chapter 3 element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3 elements are acceptable because the alternative is “adequate for the hazard.” Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is adequate for the hazard. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- Fire Alarm and Detection Systems (Section 3.8);
- Automatic and Manual Water-Based Fire Suppression Systems (Section 3.9);
- Gaseous Fire Suppression Systems (Section 3.10); and
- Passive Fire Protection Features (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee’s fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation report dated \_\_\_\_\_ to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

**Transition License Conditions**

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee’s fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
2. The licensee shall implement the following modifications to its facility, as described in Table S-2, “Plant Modifications,” of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2015, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the license amendment. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

3. The licensee shall complete the implementation items as listed in Table S-3, "Implementation Items," of Tennessee Valley Authority letter CNL-15-074, dated June 19, 2015, within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage, then implementation will occur within 60 days after startup from that scheduled refueling outage. Implementation items 32 and 33 are associated with modifications and will be completed after all procedure updates, modifications, and training are complete.
- (8) Deleted.
  - (9) The licensee shall maintain the Augmented Quality Program for the Standby Liquid Control System to provide quality control elements to ensure component reliability for the required alternative source term function defined in the Updated Final Safety Analyses Report (UFSAR).
  - (10) Mitigation Strategy License Condition  
  
Develop and maintain strategies for addressing large fires and explosions and that include the following key areas:
    - (a) Fire fighting response strategy with the following elements:
      1. Pre-defined coordinated fire response strategy and guidance
      2. Assessment of mutual aid fire fighting assets
      3. Designated staging areas for equipment and materials
      4. Command and control
      5. Training of response personnel
    - (b) Operations to mitigate fuel damage considering the following:
      1. Protection and use of personnel assets
      2. Communications
      3. Minimizing fire spread
      4. Procedures for implementing integrated fire response strategy
      5. Identification of readily-available pre-staged equipment
      6. Training on integrated fire response strategy
      7. Spent fuel pool mitigation measures
    - (c) Actions to minimize release to include consideration of:
      1. Water spray scrubbing
      2. Dose to onsite responders
  - (11) The licensee shall implement and maintain all Actions required by Attachment 2 to NRC Order EA-06-137, issued June 20, 2006, except the last action that requires incorporation of the strategies into the site security plan, contingency plan, emergency plan and/or guard training and qualification plan, as appropriate.

**ENCLOSURE 5**

**Tennessee Valley Authority  
Browns Ferry Nuclear Plant, Units 1, 2, and 3**

**Updated NFPA 805 License Amendment Request, Attachment S, Table S-3,  
"Implementation Items"**

(13 pages including cover)



Table S-3 - Items provided below are those items (procedure changes, process updates, and training to affected plant personnel) that will be completed prior to the implementation of new NFPA 805 fire protection program. This will occur within 240 days after issuance of the license amendment unless that date falls within a scheduled refueling outage. If this is the case, then implementation will occur within 60 days after startup from that scheduled refueling outage. Note that Items 32 and 33 are associated with modifications in Table S-2 and will be completed in accordance with the timetable described in the Implementation Item.

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
01	1, 2, 3	<p>Implement the results of the Radioactive Release Review:</p> <ul style="list-style-type: none"> <li>a. Within each pre-fire plan that has an access point to a non-RCA area, enhance the pre-fire plan to better identify concerns for radioactive release by incorporating one of the following options: <ul style="list-style-type: none"> <li>a. Identifying the RCA in the written text or the pre-fire plan drawings is intended to aid the Incident Commander in avoiding radioactive release. For consistency, it is recommended that hardened barriers be identified. Examples of these would include: the Unit 1 Reactor Building truck bay hatch, water tight doors to the outside as well as passage doors and roll-up door.</li> <li>b. Incorporate a descriptive text in the pre-fire plan that highlights escape path concerns specific to that pre-fire plan.</li> </ul> </li> <li>b. Add generic wording to area fire plans to prompt measures to avoid radioactive release.</li> <li>c. Pre-fire plans with doorways to the outside or to non-RCA areas will be revised and will have the plan drawing revised to include the door and an identification method to allow the BFN-FERO to recognize this as an RCA boundary.</li> <li>d. Add an appendix to the pre-fire plans for building sump drainage and site storm drains.</li> <li>e. Develop a standard operating procedure to support actions to prevent radioactive release. This document will stress actions to prevent the escape of potentially contaminated materials from a building or area boundary. Additional guidance will be provided for fires in yard areas and locations with limited or no engineering controls.</li> <li>f. Develop new pre-fire plans for the following areas: <ul style="list-style-type: none"> <li>1. East Access Building</li> </ul> </li> </ul>	4.4.2 and Attachment E

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
		<ul style="list-style-type: none"> <li>2. Low Level Radwaste Storage Modules</li> <li>3. Low Level Radwaste Tool Warehouse</li> <li>4. South Access Building</li> <li>5. Condensate Storage Tank Area</li> <li>6. Auxiliary Decay Heat Removal</li> <li>7. Outage Rad Material Storage Warehouse</li> <li>8. Off-Gas Stack</li> <li>9. Units 1, 2 "A" and "B" Chillers (Fire Area 27)</li> </ul>	
		<ul style="list-style-type: none"> <li>g. Revise the guidance within RWI-001 and/or RWI-111 to address storage of radioactive material for compliance with the radioactive release criteria. The recommended practices would include:               <ul style="list-style-type: none"> <li>1. A screening process.</li> <li>2. A boundary process.</li> <li>3. A source term process.</li> <li>4. When radioactive materials are handled outdoors and outside of containers that exceed the source term limits, consideration should be given to reducing the potential for a fire to occur.</li> </ul> </li> <li>h. Each fire brigade member will be provided training to identify potential points for radioactive release and the actions that can be taken to mitigate a release. To support the training, guidance will be provided in pre-fire plans and standard operating procedures to outline these expectations and actions.</li> </ul>	
02	1,2,3	The Fire Protection Report will be updated to include the statement that the NRC is the authority having jurisdiction (AHJ) for fire protection changes requiring approval.	4.1 and Attachment A, 3.2.2.4
03	1,2,3	The monitoring program required by NFPA 805 Section 2.6 will be implemented as part of the fire protection program transition to NFPA 805, in accordance with NFPA 805 FAQ 10-0059, and will include a process that reviews fire protection performance and trends in performance. Program specifics are provided in LAR Section 4.6.2.	4.1, 4.6.2 and Attachment A, 3.2.3(3)

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
04	1,2,3	Revise procedure NPG-SPP-18.4.7 to only allow untreated lumber with a cross section dimension of 6" x 6" or larger to be used.	4.1 and Attachment A, 3.3.1.2(1)
05	1,2,3	Procedure NPG-SPP-18.4.7 allows plastic sheeting materials that meet the requirements of NFPA 701 or UL Standard 214. UL Standard 214 has been withdrawn and will be removed from NPG-SPP-18.4.7.	4.1 and Attachment A, 3.3.1.2(2)
06	1,2,3	Revise procedure NPG-SPP-18.4.8, to include controls on the use of electric heaters, and to prohibit the use of portable fuel-fired heaters in plant areas containing equipment important to nuclear safety or where there is a potential for radiological releases resulting from a fire.	4.1 and Attachment A, 3.3.1.3.4
07	1,2,3	Revise appropriate procedures to inspect and ensure guides and bearings of active NFPA 805 required sliding fire doors are maintained well lubricated.	4.1 and Attachment A, 3.11.3(1)
08	1,2,3	Plant specifications do not include requirements for wiring installed above suspended ceilings. Revise Specification G-38 to specify that future wiring above suspended ceilings shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers.	4.1 and Attachment A, 3.3.5.1
09	1,2,3	To ensure future plant design meets the requirements for electrical raceway construction limits, revise Specification G-40 to state that flexible conduit shall only be used in lengths up to three feet.	4.1 and Attachment A, 3.3.5.2
10	1,2,3	Revise current plant transformer fire protection testing procedures (FP-0-026-INS007A, FP-0-026-INS007B, FP-0-026-INS007D, FP-1-026-INS007, FP-2-026-INS007, and FP-3-026-INS007) to ensure that the gravel drainage areas around the transformers are free of debris and capable of performing their design function.	4.1 and Attachment A, 3.3.9
11	1,2,3	Procedure NPG-SPP-1.3 will be revised to include a requirement for the prompt cleanup of combustible liquids discovered on insulation, including high flashpoint lubricating oils. Procedure NPG-SPP-18.4.7 will be updated to keep such fluids from coming in contact with hot pipes and surfaces, including insulated pipes and surfaces.	4.1 and Attachment A, 3.3.10

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
12	1,2,3	<p>There are corrective actions identified in MDQ099920100012 that will be completed prior to NFPA 805 implementation, as follows:</p> <ul style="list-style-type: none"> <li>▪ Update FPDP-1 to document annual funds for equipment, vehicles, training and education, medical and job-related physical performance evaluations, and other necessary items to accomplish the fire brigade's objectives.</li> <li>▪ Update FPDP-4 to identify the roles and responsibilities of any responding public fire department and other outside agencies.</li> <li>▪ Update Fire Brigade procedures to document how the FBL accounts for each member of the FERRO present at the scene of emergency.</li> <li>▪ Update FPDP-4 to document that standard operating procedures shall: <ul style="list-style-type: none"> <li>○ be maintained in written form and shall address the site-specific functions identified in the industrial fire brigade organizational statement.</li> <li>○ include information regarding site-specific hazards to which industrial fire brigade members can be exposed during a fire or other emergency.</li> <li>○ address the site-specific limitations of emergency response organizations.</li> <li>○ be accessible to all industrial fire brigade members.</li> </ul> </li> <li>▪ Establish a risk management policy for the fire brigade in accordance NFPA 600.</li> <li>▪ Update training documentation to include training in accordance with NFPA 600 to all personnel who may enter the warm zones.</li> <li>▪ Update procedures to include standard operating procedures requiring Fire Brigade members to wear SCBA when entering the hot zone.</li> <li>▪ Update procedures to provide identification that is easily recognizable to indicate FERRO members.</li> <li>▪ Update training documentation to include pre-fire plan awareness as part of the training for support personnel.</li> </ul>	4.1 and Attachment A, 3.4.1(a)(1), 3.4.3(a)(1)

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
13	1,2,3	Update Procedure FPDP-2 to require that pre-fire plans are made available in the control room and to the plant industrial fire brigade.	4.1 and Attachment A, 3.4.2, 3.4.2.3
14	1,2,3	Revise TPD-FBT to require fire brigade members to receive training in fire fighting considerations of radioactivity and health physics on a quarterly basis.	4.1 and Attachment A, 3.4.3(a)(2)
15	1,2,3	Revise TPD-FBT to include training for the secondary response group as to their responsibilities, potential hazards to be encountered, and interfacing with the fire brigade.	4.1 and Attachment A, 3.4.3(b)
16	1,2,3	Revise FPDP-4 to detail specific plans for plant security and radiation protection responsibilities regarding off-site fire authority response.	4.1 and Attachment A, 3.4.5.3
17	1,2,3	<p>There are corrective actions identified in MDQ099920100008 that will be completed prior to NFPA 805 implementation as follows:</p> <ul style="list-style-type: none"> <li>▪ Revise pre-fire plans to indicate that for hose stations on elevations 617' and below that are not already provided with the fire pump start buttons, a fire pump shall be started prior to operating the hose station if a fire pump is not already operating.</li> <li>▪ Verify the pump motor can meet the requirements of Section 6-3.1.3 of NFPA 20</li> <li>▪ Verify the pump motor and controller can meet the requirements of Section 6-3.1.4 of NFPA 20</li> <li>▪ Verify the power supply protective devices can meet the requirements of Section 6-3.4.1 of NFPA 20</li> <li>▪ Verify the power supply protective devices can meet the requirements of Section 6-3.4.2 of NFPA 20.</li> <li>▪ Revise inspection procedures to perform inspections of the battery chargers at the same time as the batteries are inspected in 0-SI-4.11.B.3.c.</li> <li>▪ Revise current testing procedures to operate the electric fire pumps weekly, with at least one operation accomplished by utilizing the automatic fire pump start functions.</li> </ul>	4.1 and Attachment A, 3.5.3
18	1,2,3	Equip all fire apparatus with 12 spanner wrenches and 6 hose connection gaskets for each size hose. Update procedure FP-0-000-INS005 to include this information.	4.1 and Attachment A, 3.5.15

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
19	1,2,3	<p>There are corrective actions identified in MDQ099920110005 and MDQ099920100017 that will be completed prior to NFPA 805 implementation as follows:</p> <ul style="list-style-type: none"><li>▪ Revise the applicable procedure to include retention of fire alarm signals received for at least one year.</li><li>▪ Update Control of Fire Protection Impairment documentation to indicate a retention period of 1 year from the impairment correction date for impairments related to the fire alarm and detection systems in the Impairment Tracking Log.</li><li>▪ Update applicable testing procedures to exclude test magnets from being used during smoke detector testing and to ensure smoke detectors are tested and activated using chemical smoke designed solely for smoke detector testing.</li></ul>	4.1 and Attachment A, 3.8.1
20	1,2,3	<p>There are corrective actions identified in MDQ099920100005, MDQ099920110001, MDQ099920110002, and MDQ099920110003 that will be completed prior to NFPA 805 implementation as follows:</p> <ul style="list-style-type: none"><li>▪ Update hydraulic calculations for sprinkler systems to clearly indicate the allowance for hose streams.</li></ul>	4.1 and Attachment A, 3.9.1(1)

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
21	1,2,3	<p>There are corrective actions identified in MDQ099920100007 and MDQ099920110004 that will be completed prior to NFPA 805 implementation as follows:</p> <ul style="list-style-type: none"> <li>Revise current plant inspections/walkthroughs to include a visual check for obvious defects, such as broken or missing parts, nozzle loading, or other evidence of impaired protection for the water spray systems protecting cable trays in the Unit 3 Diesel Generator Building cable and pipe tunnel, and Turbine Building EI 586 south wall, for selected cable trays.</li> <li>Revise BFN Procedure 3-SI-4.11.C.1.c to include operation of the manual tripping device for the Diesel Generator Building cable tray water spray system.</li> <li>Revise Surveillance Procedures (1- and 3-SI.4.11.C.1.c) to include an inspection of the spray nozzles for proper positioning, external loading, and corrosion, and cleaning when necessary.</li> <li>Revise Surveillance Procedures (1- and 3-SI.4.11.C.1.c) to include verification that the means of system actuation (heat detector, smoke detector, or test valve) cause the deluge valve to operate within 40 seconds.</li> <li>Revise the transformer water spray system inspection procedures to (1) verify that the water supply at the riser has not deteriorated and (2) if the reading taken at the riser indicates that the water supply has deteriorated, a gauge shall be placed on the hydraulically most remote nozzle and the results compared with the required design pressure.</li> </ul>	4.1 and Attachment A, 3.9.1(2)
22	1,2,3	<p>There are corrective actions identified in MDQ099920100004 that will be completed prior to NFPA 805 implementation as follows:</p> <ul style="list-style-type: none"> <li>Install warning signs in conspicuous locations in and around the Lube Oil Purification Room.</li> <li>Replace the existing CO<sub>2</sub> system safety signs with signs that comply with the three-panel format retroactively required by NFPA 12 – 2008.</li> <li></li> </ul>	4.1 and Attachment A, 3.10.1(1)

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
23	1,2,3	Post-transition, for personnel performing fire modeling or Fire PRA development and evaluation, TVA will develop and maintain qualification requirements for individuals assigned various tasks. Position Specific Guides will be developed to identify and document required training and mentoring to ensure individuals are appropriately qualified per the requirements of NFPA 805 Section 2.7.3.4 to perform assigned work.	4.7.3
24	1,2,3	<p>For program documentation and configuration control, implement the following:</p> <ul style="list-style-type: none"> <li>▪ The Fire Protection Design Basis Document described in Section 2.7.1.2 of NFPA 805 and necessary supporting documentation described in Section 2.7.1.3 of NFPA 805 will be created as part of transition to 10 CFR 50.48(c) to ensure program implementation following receipt of the safety evaluation.</li> <li>▪ The configuration control procedures which govern fire protection-related documents and databases will be revised to reflect the new NFPA 805 licensing bases requirements.</li> <li>▪ Several NFPA 805 document types, such as NSCA Supporting Information and Non-Power Mode NSCA Treatment, will generally require new control procedures and processes to be developed since they are new documents and databases created as a result of the transition to NFPA 805. The new procedures will be modeled after the existing processes for similar types of documents and databases. System level design basis documents will be revised to reflect the NFPA 805 role that the system components now play.</li> <li>▪ Configuration control of the Fire PRA model will be maintained by integrating the Fire PRA model into the existing processes used to ensure configuration control of the Internal Events PRA model.</li> </ul>	4.7.1, 4.7.2, and 4.7.3
25	1,2,3	The additional considerations of NEI 00-01, Revision 2, Chapter 3 will be addressed by linking the EOIs to fire safe shutdown procedures consistent with the recommendations of BWROG document, BWROG-TP-11-011, entitled, "BWROG Assessments of Generic Multiple Spurious Operations (MSOs) in Post-Fire Safe Shutdown Circuit Analysis for the Operating BWR Plants, dated June, 2011."	4.2.1.1



Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
26	1,2,3	<p>Revise Shutdown Risk Management procedures to reflect the following recommendations during higher risk evolutions (e.g., OPDRV and moving irradiated fuel assemblies) from the calculation entitled, "NFPA 805 Transition - Non-Power Operation Modes Analysis":</p> <ul style="list-style-type: none"> <li>▪ Restriction of hot work in areas during periods of increased vulnerability.</li> <li>▪ Restriction of combustible loading.</li> <li>▪ Restriction of transient combustible materials in areas during periods of increased vulnerability.</li> <li>▪ Consider plant equipment configuration changes (e.g., removing power from equipment once it is placed in its desired position).</li> <li>▪ Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability.</li> <li>▪ Reschedule the work to a period with lower risk or higher defense-in-depth.</li> <li>▪ Housekeeping.</li> <li>▪ Presence of functional fire detection and suppression equipment.</li> </ul>	4.3.2 and Attachment D
27	1,2,3	<p>The following implementation item is required based on the results of the Operator Action Feasibility Analysis:</p> <ul style="list-style-type: none"> <li>▪ Develop / revise post-fire response procedures to reflect the NSCA.</li> </ul>	Attachment G
28	1,2,3	<p>The following implementation item is required based on the results of the Operator Action Feasibility Analysis:</p> <ul style="list-style-type: none"> <li>▪ Identify required tools during the procedure validation and verification.</li> </ul>	Attachment G
29	1,2,3	<p>The following implementation item is required based on the results of the Operation Action Feasibility Analysis:</p> <ul style="list-style-type: none"> <li>▪ Document staffing requirements for revised post-fire response procedures.</li> </ul>	Attachment G

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
30	1,2,3	The following implementation item is required based on the results of the Operation Action Feasibility Analysis: <ul style="list-style-type: none"> <li>Train operators on revised post-fire response procedures.</li> </ul>	Attachment G
31	1,2,3	The following implementation item is required based on the results of the Operation Action Feasibility Analysis: <ul style="list-style-type: none"> <li>Revise training requirements for post-fire response procedures to include periodic drills.</li> </ul>	Attachment G
32	1, 2, 3	Update the Fire PRA model, as necessary, after all modifications are complete (returned to operation) and in their as-built configuration. The update will include a verification of the validity of the reported change in risk on as-built conditions after the modifications are completed. If this verification determines that the risk metrics have changed such that the RG 1.174 acceptance guidelines are not met, the Nuclear Regulatory Commission (NRC) will be notified and additional analytical efforts, and/or procedure changes, and/or plant modifications will be made to assure the RG 1.174 risk acceptance criteria are met.	Section 4.8.2
33	1,2,3	Update the fire HRA (Human Reliability Analysis) upon completion of all procedure updates, all modifications and all training. The update will include a verification of the validity of the reported change in risk on as-built conditions after the procedure updates, modifications, and training are completed. If this verification determines that the risk metrics have changed such that the RG 1.174 acceptance guidelines are not met, the Nuclear Regulatory Commission (NRC) will be notified and additional analytical efforts, and/or procedure changes, and/or plant modifications will be made to assure the RG 1.174 risk acceptance criteria are met.	Attachments G and V

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
34	1,2,3	<p>Revise the following EEEEs to meet the administrative requirements for engineering evaluations in accordance with the applicable criteria provided in RG 1.205 and NEI 04-02, as supplemented by FAQ 06-0008 and FAQ 07-0054.</p> <ul style="list-style-type: none"> <li>▪ The following EEEEs documented in the Fire Hazard Analysis: <ul style="list-style-type: none"> <li>○ FHA Section 3.3.4.e SBGT Duct Penetrations</li> <li>○ FHA Section 4.1 Flood Control Doors</li> <li>○ FHA Section 4.2 Personnel and Equipment Access Locks</li> <li>○ FHA Section 4.3 Main Steam and Feedwater Piping Tunnel Barriers</li> </ul> </li> <li>▪ MDQ0100890035 - Fire Boundary Seal Design for Gypsum Walls</li> <li>▪ RIMS B22 911004 003 Engineering Evaluation of the Bus Duct Penetrations</li> <li>▪ RIMS B22 911004 201 Engineering Evaluation for the Unprotected Openings in 1-Hour Floor Ceiling Assemblies on Elevation 621.25 and 639 Reactor Buildings</li> </ul>	4.2.2
35	1,2,3	Revise NPG-SPP-18.4.7 to establish limits on the types and quantities of materials in designated storage areas.	4.1 and Attachment A, 3.3.1.2(4)
37	1,2,3	Revise design output to ensure interior epoxy floor finishes meet the Class I requirements and interior carpet floor finishes meet the Class I requirements.	4.1 and Attachment A, 3.3.3
38	1,2,3	Develop specific guidance and restrictions on bulk flammable gas storage onsite.	4.1 and Attachment A, 3.3.7, 3.3.7.1, 3.3.7.2
39	1,2,3	Revise FPDP-4 to require that off-site fire authorities be offered a plan for their interface during fire emergencies onsite.	4.1 and Attachment A, 3.4.5.1
40	1,2,3	Establish a contract for maintenance and hydrostatic testing of fire extinguishers in accordance with NFPA 10.	4.1 and Attachment A, 3.7
41	1,2,3	Revise flow drawings for the CO <sub>2</sub> systems to note the CO <sub>2</sub> shutoff valves are locked in the open position.	4.1 and Attachment A, 3.10.5
42	1,2,3	Revise design output procedure to ensure interior wall and ceiling finishes meet the NFPA 101 material requirements.	4.1 and Attachment A, 3.3.3

Table S-3 Implementation Items

Item	Unit	Description	LAR Section / Source
43	1,2,3	Revise the procedure NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work), to incorporate corrective actions identified in MDQ0009992013000160.	4.1 and Attachment A, 3.3.1.3.1
45	1,2,3	Revise procedures NPG-SPP-18.4.7, Control of Transient Combustibles, and NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work), to strengthen risk and defense in-depth administrative controls (e.g., no storage and no hot work designated areas).	Attachment C and V
46	1,2,3	Verification of the condition of electrical cabinet doors to meet Fire Modeling Assumptions will be included in the monitoring Program.	Response to RAI PRA 01.d.i
47	1,2,3	Perform a focused-scope peer review of the Fire PRA. The peer review will include, as a minimum, the following elements: Fire PRA Cable Selection and Location (CS), Human Reliability Analysis (HRA), Fire Risk Quantification (FQ), Uncertainty and Sensitivity Analysis (UNC), Accident Sequence Analysis (AS), and LERF Analysis (element LE-C6). Any focused scope peer review Finding level Facts and Observations (F&Os) will be resolved prior to self-approval of post-transition changes.	Response to RAI PRA 11.a, b and c, PRA RAI 23.d and PRA RAI 24 Part b
48	1,2,3	Develop and deliver training to Fire Operations on incipient detection systems alarm response procedures.	Response to FPE RAI 10, Revision 1
49	1,2,3	Revise the program that monitors BFN Residual Heat Removal (RHR) heat exchanger performance for consistency with the assumptions of the NFPA 805 Net Positive Suction Head (NPSH), Containment Parameters, and AREVA Fuel peak centerline temperature (PCT) Analysis calculation related to the RHR heat exchanger k-factor.	Attachment X / NRC electronic mail from F. Saba (NRC) to G Williams (TVA) and C. Szabo (TVA), "Browns Ferry NFPA 805 LAR," dated June 10, 2015

**ENCLOSURE 7**  
**Tennessee Valley Authority**  
**Browns Ferry Nuclear Plant, Units 1, 2, and 3**  
**NFPA 805 Regulatory Commitment List**  
**Revision 1**

This Enclosure provides the NFPA 805 updated List of Regulatory Commitments with the revised Commitment 2 change identified in this letter indicated by revision bars to the right of the revised commitment. Additionally, this Enclosure includes a previously identified changes to Commitment 3 as revised by TVA letter dated August 14, 2014, and Commitments 4 and 14 as revised by TVA letter dated August 26, 2014. The updated List of Regulatory Commitments provided in this Enclosure supersedes any previous BFN NFPA 805 List of Regulatory Commitments.

1. TVA will submit a License Amendment Request proposing Technical Specifications requirements for the new emergency high pressure makeup pump system on a schedule to support the modification implementation date provided in Section 5.5 of the enclosure to this letter.
2. [Relocated to NFPA 805 License Amendment Request, Attachment S, Table S-3.]
3. TVA will maintain the existing hourly fire watches for all existing BFN fire areas except the following Reactor Building areas: the quads below the 565' elevation, the HPCI Room, and the torus area in each unit. These excepted locations will require once per eight hour shift roving fire watches. The fire watches will remain in place until the modifications described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.
4. TVA will implement stricter control of transient combustibles for the following BFN FAs [Fire Areas]: FA 01-03, FA 01-04, FA 02-02, FA 02-03, FA 02-04, FA 03-01, FA 03-02, FA 03-03, FA 16 (except for Main Control Room and Cable Spreading Room), FA 20, FA 21, and FA 25-01 (South Section of Elevation 550' only) until the modifications described for the listed FAs in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed. Transient combustibles will be controlled as follows:
  - a. "In-Use" transient combustibles are acceptable without further evaluation; however, transient combustibles cannot be staged or stored in these higher risk areas unless:
    - 1) a transient combustible evaluation is performed,
    - 2) the transient combustibles are staged/stored in a closed metal container (e.g., cabinets, tool boxes, gang boxes, metal drums), or
    - 3) the transient combustibles are continuously attended.
  - b. Transient combustible evaluations for staged/stored transient combustibles will be tracked to control quantities of transient combustibles allowed into these fire areas; and
  - c. Performing once-per-shift walkdowns to ensure that transient combustible controls are satisfied (e.g., waste, debris, scraps, rags or other combustibles resulting from work activities are removed from the subject fire areas, and that no transient combustibles are placed in the 20-foot exclusion zone(s) within the listed FAs).

5. TVA will implement controls limiting hot work activities (e.g., welding, cutting, and grinding) in FA 01-03, FA 01-04, FA 02-02, FA 02-03, FA 02-04, FA 03-01, FA 03-02, FA 03-03, FA 04, FA 08, FA 09, FA 16, FA 20, FA 21, FA 22, FA 23, FA 24, FA 25-01, FA 26, and FA SWITCH until the modifications described for the listed FAs in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

If hot work activities are necessary, the existing hot work controls specified in NPG-SPP-18.4.8, Control of Ignition Sources, shall be augmented to require that the Fire Brigade or Senior Reactor Operator perform a pre-job briefing in accordance with NPG-SPP-18.2.2, Human Performance Tools, and perform a walkdown for job area familiarization prior to performing the hot work activity. This walkdown shall include, ensuring travel path is clear of obstructions, identifying the location of fire hoses and fire extinguishers, and verifying fire suppression systems (manual and automatic) are properly aligned.

TVA will implement these controls by May 31, 2013.

6. TVA will implement controls to credit temporary diesel generators as an additional power source for a shutdown board, except during those periods when the temporary diesel generators are being used to support alternate decay heat removal or when moving a filled spent fuel storage cask past the temporary diesel generators, until the modifications described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

7. TVA will implement controls to protect RHR Pump 1A and its associated support systems whenever hot work activities are performed in FA 01-04, FA 04, and FA 09 until the modifications for the listed FAs described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

8. TVA will implement controls to protect the Unit 1 RHR Train A and its associated support systems whenever hot work activities are performed in FA 08 until the modifications associated with FA 08 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

9. TVA will implement controls to protect the following equipment whenever hot work is being performed in FA 02-02 until the modifications for FA 02-02 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed:
  - a. Fire protection systems (detection and suppression) for this FA;
  - b. North Emergency Equipment Cooling Water (EECW) Header;
  - c. 4kV Shutdown Board B, 3EA, 3EB;
  - d. 250V DC Battery Charger 1;
  - e. 480V Reactor Motor Operated Valve (RMOV) Board 1A, 2A, 2D;
  - f. 480V Shutdown Boards 1A and 2A;
  - g. 2C RHR Pump;
  - h. 480V Shutdown Board 2A Transformer TS2A; and
  - i. Shutdown Board 250V DC Battery Charger SB-B.

TVA will implement these controls by May 31, 2013.

10. TVA will implement controls to protect the following equipment whenever hot work is being performed in FA 02-03 until the modifications for FA 02-03 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed:
- a. Fire protection systems (detection and suppression) for this FA;
  - b. North EECW Header;
  - c. Residual Heat Removal Service Water (RHRSW) Pump D1;
  - d. 4kV Shutdown Board D, 3EA, 3EB;
  - e. 250V DC Battery Charger 1;
  - f. 480V RMOV Board 1A, 2B, and 3A;
  - g. 480V Shutdown Boards 1A and 2B;
  - h. 2D RHR Pump & RHR Crosstie Unit 3 to Unit 2; and
  - i. 480V Shutdown Board 2B Transformer TS2B.

TVA will implement these controls by May 31, 2013.

11. TVA will implement controls to protect the following equipment whenever hot work is being performed in FA 02-04 until the modifications for FA 02-04 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed:
- a. Fire protection systems (detection and suppression) for this FA;
  - b. North EECW Header;
  - c. B1 and D1 RHRSW Pump;
  - d. 4kV Shutdown Board D, 3EA, 3EB, and 3ED;
  - e. Shutdown Board 250V DC Battery Charger SB-D;
  - f. 480V RMOV Board 1 A and 3B;
  - g. 2D RHR Pump; and
  - h. 480V Shutdown Board 2B Transformer TS2B.

TVA will implement these controls by May 31, 2013.

12. TVA will implement controls to protect RHRSW Pump 2B and its associated support systems whenever hot work activities are performed in FA 03-03 until the modifications for FA 03-03 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

13. TVA will institute 30-minute roving fire watches in FA 16 for non-continuously manned areas until the modifications for FA 16 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

14. TVA will designate the FA 04, FA 08, FA 09, FA 16 (Cable Spreading Room only), FA 22, FA 23, FA 24, and FA 25-01 (North Section of Elevation 550' only) as transient combustible-free areas, perform once-per-shift walkdowns to ensure that transient combustible controls are satisfied, and establish the same controls as the current 20-foot exclusion zones, except that tags required by plant procedures may be present in these FAs, until the modifications for the listed FAs described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

15. TVA will implement controls to limit the unavailability of an entire EECW header (north or south) until the modifications described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

16. TVA will increase the testing frequency of automatic fire doors in FA 22, FA 23, and FA 24 to once-per-6 months until the modifications described for the listed FAs in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

17. TVA will implement controls to protect the following equipment whenever hot work is being performed in FA 20 until the modifications for FA 20 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed:
  - a. Fire protection systems (detection and suppression) for this FA;
  - b. North EECW Header;
  - c. 4kV Shutdown Board 3EA and 3EB;
  - d. 480V Common Board 1 Transformer TC1A; and
  - e. 250V DC Battery Charger 1.

TVA will implement these controls by May 31, 2013.

18. TVA will implement controls to ensure that Heating, Ventilation and Air Conditioning (HVAC) is available to the BFN Unit 3 Main Control Room whenever Transformer TS3A is unavailable or the EECW South Header is unavailable until the modifications for FA 20 described in Attachment S, Table S-2, "Plant Modifications Committed," of the enclosure to this letter are installed.

TVA will implement these controls by May 31, 2013.

19. TVA will inform the NRC 30 days prior to discontinuing each of the interim compensatory measures identified in Commitments 3 through 18, above.