



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

CNL-14-032

February 28, 2014

10 CFR 2.202
10 CFR 50.4

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

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

Subject: **Second Six-Month Status Report in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) for Browns Ferry Nuclear Plant (TAC Nos. MF0902, MF0903, and MF0904)**

- References:
1. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A735)
 2. NRC Interim Staff Guidance JLD-ISG-2012-01, "Compliance with Order EA-12- 049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," Revision 0, dated August 29, 2012 (ML12229A174)
 3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012 (ML12242A378)
 4. Letter from TVA to NRC, "Tennessee Valley Authority (TVA) - Initial Status Report in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated October 29, 2012 (ML12307A104)

5. Letter from TVA to NRC, "Tennessee Valley Authority (TVA) - Overall Integrated Plan in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) for Browns Ferry Nuclear Plant," dated February 28, 2013 (ML13064A465)
6. Letter from TVA to NRC, "First Six-Month Status Report in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) for Browns Ferry Nuclear Plant," dated August 28, 2013 (ML13247A284)
7. Letter from NRC to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0902, MF0903, and MF0904)," dated December 19, 2013 (ML13353A166)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to Tennessee Valley Authority (TVA). Reference 1 was immediately effective and directs TVA to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities following a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document Nuclear Energy Institute (NEI) 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the TVA initial status report regarding mitigation strategies. Reference 5 provided the TVA Browns Ferry Nuclear Plant, Units 1, 2, and 3 overall integrated plan.

Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 6 provided the first six-month status report.

The NRC issued its Interim Staff Evaluation regarding TVA's overall integrated plan on December 19, 2013 (Reference 7).

The purpose of this letter is to provide the second six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The enclosed report provides an update of milestone accomplishments since submittal of the first six-month status report, including any changes to the compliance method or schedule. It is noted in Section 7 of the Enclosure that TVA is evaluating potential changes to the capacity and storage options of the current 3 MW FLEX diesels and the potential need for relief regarding Order EA-12-049 FLEX/Order EA-13-109 containment venting interface.

The purpose of this letter is to provide the second six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The enclosed report provides an update of milestone accomplishments since submittal of the first six-month status report, including any changes to the compliance method or schedule.

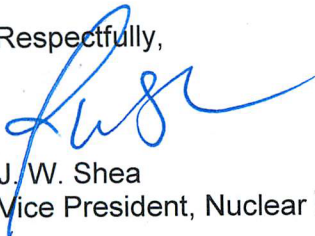
It is noted in Section 7 of the Enclosure that TVA is evaluating potential changes to the capacity and storage options of the current 3 MW FLEX diesels and the potential need for relief regarding Order EA-12-049 FLEX/Order EA-13-109 containment venting interface. Any changes to the Browns Ferry Nuclear Plant mitigation strategies resulting from this review will be provided to the NRC in the third six-month status report

The Enclosure describes the plans that TVA will use to meet the regulatory requirements outlined in Attachment 2 of Reference 1, but does not identify any additional actions to be taken by TVA. Therefore, this letter contains no regulatory commitments.

If you have any question regarding this submittal, please contact Kevin Casey at (423) 751-8523.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of February 2014.

Respectfully,



J.W. Shea
Vice President, Nuclear Licensing

Enclosure:

Tennessee Valley Authority Browns Ferry Nuclear Plant's Second Six Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

cc (Enclosure):

NRR Director - NRC Headquarters
NRO Director - NRC Headquarters
NRC Regional Administrator - Region II
NRC Project Manager - Browns Ferry Nuclear Plant
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

ENCLOSURE

TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT'S SECOND SIX MONTH STATUS REPORT FOR THE IMPLEMENTATION OF ORDER EA-12-049, ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS

1 Introduction

Browns Ferry Nuclear Plant (BFN) developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This attachment provides an update of milestone accomplishments since submittal of the first six-month status report regarding the Overall Integrated Plan, including any changes to the compliance method or schedule.

2 Milestone Accomplishments

The following milestone(s) have been completed since the development of the Overall Integrated Plan (Reference 1 in Section 8), and are current as of January 31, 2014.

None

3 Milestone Schedule

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

The revised milestone target completion dates do not impact the order implementation date.

Activity	Original Target Date	Activity Status	Revised Target Completion Date
Submit Overall Integrated Plan	February 2013	Complete	
Submit 6 Month Updates:			
Update 1	August 2013	Complete	
Update 2	February 2014	Complete	
Update 3	August 2014	Not Started	
Update 4	February 2015	Not Started	
Update 5	August 2015	Not Started	
Update 6	February 2016	Not Started	
Update 7	August 2016	Not Started	
FLEX Strategy Evaluation	October 2013	Started	March 2014
Unit 1 - Validation of connection points for FLEX Phase 2 & 3 via walkthrough or demonstration. (Graded approach)	November 2016 ¹	Not Started	

Activity	Original Target Date	Activity Status	Revised Target Completion Date
Unit 2 - Validation of connection points for FLEX Phase 2 & 3 via walkthrough or demonstration. (Graded approach)	May 2015 ¹	Not Started	
Unit 3 - Validation of connection points for FLEX Phase 2 & 3 via walkthrough or demonstration. (Graded approach)	April 2016 ¹	Not Started	
Perform Staffing Analysis	October 2014	Not Started	January 2015
Modifications:			
Modifications Evaluation	October 2013	Started	March 2014
Unit 1 N-1 Walkdown	October 2014	Not Started	
Unit 1 Design Engineering	December 2014 ¹	Started	Nov. 2014
Unit 1 Implementation Outage	November 2016	Not Started	October 2016
Unit 2 N-1 Walkdown	March 2013	Complete	
Unit 2 Design Engineering	December 2014 ¹	Started	Nov. 2014
Unit 2 Implementation Outage	May 2015	Not Started	
Unit 3 N-1 Walkdown	February 2014	Started	March 2014
Unit 3 Design Engineering	December 2014 ¹	Started	Nov. 2014
Unit 3 Implementation Outage	April 2016	Not Started	March 2016
Storage:			
Storage Design Engineering	March 2014 ¹	Not On Track with current strategy of FESB for 4kv FLEX DG and installation & connection	Nov. 2014
Storage Implementation	February 2015 ¹	Not On Track with current strategy of FESB for 4kv FLEX DG and installation & connection	Nov. 2015
FLEX Equipment:			
Procure On-Site Equipment	October 2013	Started	January 2015
Develop Strategies with RRC	December 2013	Started	June 2014
Install Off-Site Delivery Station	May 2015 ¹	Started	
Procedures:			
BWROG issues FSG guidelines	January 2014	Started	April 2014
Create Browns Ferry FSGs	March 2014	Started	March 2015
Create Maintenance Procedures	June 2014	Not Started	March 2015
Training:			
Develop Training Plan	January 2014	Not Started	Sept. 2014
Implement Training	March 2014	Not Started	January 2015

Activity	Original Target Date	Activity Status	Revised Target Completion Date
Unit 1 FLEX Implementation	November 2016	Not Started	
Unit 2 FLEX Implementation	May 2015	Not Started	
Unit 3 FLEX Implementation	April 2016	Not Started	
Full Site FLEX Implementation	November 2016	Not Started	
Submit Completion Report	December 2016	Not Started	
Notes: 1. These milestones were not included in the February 28, 2013, Overall Integrated Plan			

4 Changes to Compliance Method

The following is a list of changes made to the information provided in the February 28, 2013, Overall Integrated Plan (Reference 1) and not provided in previous 6 month updates. These changes meet the NEI 12-06 compliance method.

4.1 (Section 4, Item 5 & Attachment 1A, Item 5) was changed to read as follows:

“Item 5: All 3 units are assumed to have been operating at 100 percent rated thermal power for at least 100 days or have just been shut down from such a power history as required by plant procedures in advance of the impending event. For floods, FLEX deployment would have already been complete and the units would be at cold shutdown.”

4.2 (Section 4, Item 8) was changed to read as follows:

“Item 8: Dispatch personnel to deploy the Diesel Driven FLEX Pumping Systems FPS1, FPS2, FPS3, FPS4 and commence laying hose, as required. (Note: these pumps will have already been deployed for a DBF (see Item 2). Plant Staff will begin establishing the FLEX pumps as soon as notified that the station is in an SBO (before the rest of the FLEX procedures are entered). New procedure guidance is to be developed as part of the FLEX Support Guidelines (FSGs).

Table top evaluation and demonstration with one pump assembly (without augmented suction lift pumps) was performed by site personnel to obtain an 8 hour estimate for deploying all the FLEX pumps and hoses. Further evaluations and improvements will be pursued and it is anticipated that the deployment time can be reduced to 6 hours. A formal validation of the timeline will be performed once the procedure guidance is developed and related staffing study is completed (Open Item, OI 16). ”

4.3 (Various sections throughout the OIP) corrected typo as follows:

“FDMG was changed to FMDG.” FMDG = Flex Medium Voltage Diesel Generator (4160v AC)

4.4 **(Section 4 Item 18)** changed to read as follows:

“Item 18: If any 480v FLEX DG did not start and load, then dispatch team to align battery chargers to 4kv distribution system (Note: N+1 for battery charging is considered a 4kv FLEX DG unit for a tornado event that exceeds the protection basis for the 480 V FLEX DGs.). Either of the 4 kV FLEX DGs, FMDG1 or FMDG2, can be aligned to feed the battery chargers credited for Batteries 1 or 2. 4kV FLEX DG, FMDG3 can be aligned to feed the battery charger credited for Battery 3.

Site personnel are estimated to complete this action within 1 hour, if required. Since this activity begins at T+6 hours, and safety related batteries will last 12 hours without charging, the maximum allowable time for this activity is 6 hours. A formal validation of the timeline will be performed once the design is finalized, procedure guidance is developed, and the related staffing study is complete.”

4.5 **(Section 4, Item 19)** was changed to read as follows:

“Item 19: A tabletop and pump demonstration indicates this can be complete in 8 hours, beginning with the SBO. Crews have done an exercise to install and pump with the low pressure FLEX pumps; however, the augmented suction lift for extreme low lake level has not yet been practiced. Further evaluations and improvements will be pursued and it is anticipated that the deployment time can be reduced to 6 hours. Formal validation of the timeline will be performed once procedural guidance is developed and the related staffing study is complete.”

4.6 **(Section 4, Item 23)** Added the following note:

“Note: Use of the Torus vent would be limited to use by only one of the BFN units; due to cancellation of NRC Order EA-12-050 and issuance of NRC Order 13-109. The currently installed hardened Torus vent is only designed to vent a single reactor unit and any changes to the system will be driven and in compliance with NRC Order EA-13-109.”

4.7 **(Section 10)** a new paragraph was added:

“BFN will follow the guidance contained within the Nuclear Energy Institute (NEI) position paper dated September 18, 2013, entitled “Position Paper: Shutdown/Refueling Modes” (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML13273A514) which the NRC has endorsed.”

4.8 **(Section 10C)** changed instrumentation for key reactor parameters to read as follows:

- 1,2,3-LI-3-52 Reactor Vessel Water Level – Post Accident Flood Range
- 1,2,3-LI-3-62 RPV Level Reactor Vessel Water Level – Post Accident Flood Range
- 1,2,3-LI-3-58A Reactor Vessel Water Level – Emergency Systems Range
- 1,2,3-LI-3-58B Reactor Vessel Water Level – Emergency Systems Range
- 1,2,3-PI-3-74A Reactor Pressure
- 1,2,3-PI-3-74B Reactor Pressure

4.9 **(Section 11)** new paragraph was added:

“BFN will follow the guidance contained within the Nuclear Energy Institute (NEI) position paper dated September 18, 2013, entitled “Position Paper: Shutdown/ Refueling Modes” (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML13273A514) which the NRC has endorsed.”

4.10 **(Section 11 Item 2))** was changed as follows:

Removed reference to ability to crosstie 480v FLEX DG's output to supply another unit's battery charger. This feature is not being incorporated into the modification for installation of the 480v FLEX DG's.

4.11 **(Section 11 Item 3)b))** was changed as follows:

Removed references from other possible connection options; and clarified that FPS1 would be connected at the 'D' EECW header at the intake pumping station, FPS2 would be connected to the 'B' RHRSW header at the intake pumping station, and FPS3 would be connected at the 'D' RHRSW header at the intake pumping stations.

4.12 **(Section 11b)** the following modifications are not currently being pursued and have been deleted from the OIP:

- Modify 4 inch Reactor Building penetrations, currently used to provide air for the CILRT to be accessible outside the RHRSW Tunnels and above the PMF level. The extended penetration will be modified to allow a FLEX pump discharge hose connection. (Open Item, OI 9)
- Install new connections at the CSTs for direct connection to the FLEX pumps. (Open Item, OI 9)

4.13 **(Section 11b)** changed last bullet to read as follows:

“Modify currently installed hardened wetwell vent to install backup pneumatic supply, to allow use within current design limits. (Use of the vent should not be necessary, based on 4kv FLEX DG availability). (Open Items, OI 9 and OI 11)”

4.14 **(Section 11b)** changed the next to last bullet to remove reference to Open Item 11, as it was an incorrect reference.

4.15 **(Section 11b)** added modification as follows:

Modify RCIC lube oil cooling line to allow a hose to be connected from the south EECW header nearby to provide turbine lube oil cooling for RCIC. This strategy utilizes FPS1 to provide the cooling water supply.

4.16 **(Section 11e)** clarified table as follows:

Current design is to install connections for FPS1, FPS2 & FPS3 at the following locations:

- FPS1 – Connect to 'D' EECW header at the intake pumping station
- FPS2 – Connect to the 'B' RHRSW header at the intake pumping station.
- FPS3 – Connect to the 'D' RHRSW header at the intake pumping station.

Deleted reference to modification to add connections to the CST for makeup.

4.17 **(Section 13)** clarified first paragraph as follows:

Clarified that the Hardened Containment Vent System, currently installed, can mitigate the event on a single unit.

Clarified fourth paragraph as follows:

The containment vent system is not credited for Phase 1; however, modifications to the containment vent system are planned in response and scheduled to be complete in accordance with NRC Order EA-13-109

4.18 **(Section 13b)** clarified first paragraph as follows:

Clarified that the Hardened Containment Vent System, currently installed, can mitigate the event on a single unit; and that the vent would be installed in accordance with the schedule for NRC order EA-13-109.

Added the following paragraphs:

1,2,3-LI-64-159A & 1,2,3-64-159B, Torus Level Div. I & 2, will be modified to be DC backed up instruments.

1,2,3-TI-64-52AB, Drywell Temperature, will be modified to be DC backed up instruments.

4.19 **(Section 13c)** changed Containment essential parameters to read as follows:

- 1,2,3-PI-64-67B, Drywell Pressure
- 1,2,3-TI-64-52AB, Drywell Temperature
- 1,2,3-LI-1,2,3-LI-64-159A, Wide Range Torus Level
or
- 1,2,3-LI-1,2,3-LI-64-159B, Wide Range Torus Level
- 1,2,3-TI-64-161, Suppression Pool Temperature
or
- 1,2,3-TI-64-162, Suppression Pool Temperature

4.20 **(Section 14 Item 3)b)** was changed as follows:

Removed references from other possible connection options; and clarified that FPS1 would be connected at the 'D' EECW header at the intake pumping station, FPS2 would be connected to the 'B' RHRSW header at the intake pumping station, and FPS3 would be connected at the 'D' RHRSW header at the intake pumping stations.

4.21 **(Section 14)** – Deleted reference to NRC Order EA-13-109.

4.22 **(Section 14b)** the following modifications are not currently being pursued and have been deleted from the OIP:

- Modify 4 inch Reactor Building penetrations, currently used to provide air for the CILRT to be accessible outside the RHRSW Tunnels and above the PMF level. The extended penetration will be modified to allow a FLEX pump discharge hose connection. (Open Item, OI 9)
- Install new connections at the CSTs for direct connection to the FLEX pumps. (Open Item, OI 9)

Clarified that the connection points will be added to the 'D' EECW header and 'B' and 'D' RHRSW headers will be made at the intake pumping station and not with the 'B' and 'D' RHRSW tunnels.

Removed reference to installation of the Hardened Containment Vent System per NRC Order EA-12-050, which was cancelled. BFN intends to comply with the schedule for implementation of NRC Order EA-13-109.

4.23 **(Section 16)** the following sentence was added to clarify expected refuel floor conditions. This clarification was requested by the NRC during the RAI/Audit process for issuance of the BFN Interim Safety Evaluation Report:

Using realistic analysis, none of the spent fuel pools at BFN currently have greater than a 3 degree per hour heatup rate immediately following fuel shuffles. Based on being at the Tech Spec limit of 150 degrees, approximately 20 hours are available for action to be taken prior to pool boil following the ELAP and LUHS. Using the administrative limit for SFP Temperature of 125 degrees, this allows approximately 30 hours for actions to be taken. (Ref. 4)

4.24 **(Section 17 Item 3)b)** was changed as follows:

Removed references from other possible connection options; and clarified that FPS1 would be connected at the 'D' EECW header at the intake pumping station, FPS2 would be connected to the 'B' RHRSW header at the intake pumping station, and FPS3 would be connected at the 'D' RHRSW header at the intake pumping stations.

4.25 **(Section 17e)** clarified table as follows:

Current design is to install connections for FPS1, FPS2 & FPS3 at the following locations:

- FPS1 – Connect to 'D' EECW header at the intake pumping station
- FPS2 – Connect to the 'B' RHRSW header at the intake pumping station.
- FPS3 – Connect to the 'D' RHRSW header at the intake pumping station.

4.26 **(Section 18 Item 3b))** was changed as follows:

Removed references from other possible connection options; and clarified that FPS1 would be connected at the 'D' EECW header at the intake pumping station, FPS2 would be connected to the 'B' RHRSW header at the intake pumping station, and FPS3 would be connected at the 'D' RHRSW header at the intake pumping stations.

4.27 **(Section 19)** added the following action to discussion of RHR / CS Room Habitability:

Start all RHR and Core Spray room coolers. This will provide cooling in all four quadrants of the Reactor Building elevation 519'.

4.28 **(Section 19)** added the following action to discussion of ESF Switchgear rooms:

Normal air conditioning and ventilation can be restored to these rooms following the energization of the safety related electrical boards by the 4kv FLEX DG's.

4.29 **(Section 20)** added paragraph to address NRC Open Item 3.2.4.5.A from the BFN Interim Safety Evaluation (ADAMS Document ML13225A541), which stated the following:

3.2.4.5 Protected and Internal Locked Area Access

NEI 12-06, Section 3.2.2, Guideline (9) states:

Plant procedures/guidance should consider the effects of ac power loss on area access, as well as the need to gain entry to the Protected Area and internal locked areas where remote equipment operation is necessary.

At some plants, the security system may be adversely affected by the loss of the preferred or Class 1 E power supplies in an ELAP. In such cases, manual actions specified in ELAP response procedures/guidance may require additional actions to obtain access. The licensee provided no information regarding local access to the protected areas under ELAP. This has been identified as Open Item 3.2.4.5.A. in Section 4.1.

This paragraph was added to the OIP to address the open item discussed above:

Protected Area and Vital Area Access

BFN Nuclear Security maintains available, a Power Independent Alternate Power source ensuring that Security attributes can be maintained during a loss of all Plant Off-Site and On-Site AC power. If Nuclear Security's alternate power source is lost, then Nuclear Security has compensatory plans ready with actions prioritized. These plans are developed to continue site protective measures and support security related elements of an emergency response, including access to Plant Vital Areas through Security Locks and management of the Protected Area Vehicle Barrier System. In addition to these security compensatory plans, FLEX procedures will be screened for security related impediments and where applicable added measures will be afforded to ensure prompt implementation of a given strategy.

- 4.30 **(Section 24)** added clarifying notes to Phase 3 response equipment
- 4.31 **(Various sections throughout the OIP)** Reference to FESB was changed to FESB(s). Current plan is to have two separate FESB's, with the FLEX Pumps, hoses and other supplies stored in one; and, The 4kv FLEX DG's and its support equipment stored in the other.
- 4.32 **(Open Item 11)** Removed the following sentence to ensure no conflict with future guidance for compliance with NRC Order EA-13-109:

This will include modifying the HCVS system to permit controlled venting more than one unit at the same time, if necessary.

Clarified that Design and installation of modifications to the Hardened Containment Vent System would be performed in accordance with the schedule for NRC Order EA-13-109.

- 4.33 **(Attachment 1A)** Adjusted the following times on the Sequence of Events Timeline:
- T_{≤1} hour – Dispatch personnel to start the 480v FLEX DG and energize battery chargers
 - T_{≤1} hour – Exit SBO procedure and enter Flex Support Guidelines
 - T_{≤1} hour – Commence shallow DC load shed if a 480v FLEX DG fails
 - T+5 hours – Verify 4kv FLEX DG's are started and ready for service
 - T+6 hours – Energize battery chargers from 4kv FLEX DG if any 480v FLEX DG fails.
 - T+6 hours – FLEX Pumping Systems are deployed and ready for service
 - T+7 hours – Transition to Phase 2

- 4.34 **(Attachment 1B)** Deleted the following from Note 2:

Any changes to the vent configuration as detailed in accordance with EA-13-109 will be conservative compared to the NEDC 33771P. The proposed configuration will have a throttling valve installed to allow operations to control containment pressure to limit the rise of the Wetwell temperature. A proposed modification to connect the Drywell vent to the HCVS discharge path will also allow a controlled vent pressure to be within OPS control (Open Item, OI 11).

4.35 **(Updated Index of Figures)** updated figures to show current electrical connections for the 4kv FLEX and 480v FLEX Diesel Generators, updated haul paths for FLEX pumps and deleted Figure 3C which show routing of piping outside the RHRSW Pipe tunnel because modification is no longer being pursued.

5 Need for Relief/Relaxation and Basis for the Relief/Relaxation

TVA expects to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items from Overall Integrated Plan and NRC Evaluation

The following tables provide a summary of the open items documented in the Overall Integrated Plan or the NRC Evaluation and the status of each item.

Overall Integrated Plan Open Item	Status
OI-1: Flood and seismic re-evaluations pursuant to the 10 CFR 50.54(f) letter of March 12, 2012 are not completed and therefore not assumed in this submittal. As the re-evaluations are completed, appropriate issues will be entered into the corrective action system and addressed.	Started
OI-2: Liquefaction of haul routes for FLEX will be analyzed.	Not Started
OI-3: TVA will confirm that they have enough fuel onsite for the first 24 hours. A diesel fuel storage and refueling plan also has to be developed.	Started
OI-4: BFNP will evaluate SRV qualification against the predicted containment response with FLEX implementation to ensure there will be sufficient DC bus voltage and pneumatic pressure to operate the SRVs throughout Phase 1 and Phase 2.	Started
OI-5: An electrical load study will be performed to ascertain the ability of the common Unit 1 & 2 chillers to be placed into service powered by the FLEX DGs that would provide chilled water for the Unit 1 & 2 Control Bay and the Unit 1 & 2 Electric Board rooms.	Started
OI-6: Formalize the preliminary Battery studies that were performed to ensure appropriate battery life will be available with regards to the overall FLEX strategies.	Started
OI-7: BFNP will take actions as necessary to assure RCIC can operate at elevated temperatures.	Started
OI-8: Perform modifications, as necessary, to ensure that RCIC is seismically robust.	Started

Overall Integrated Plan Open Item	Status
OI-9: Develop and perform the design modifications identified in the FLEX Strategy document to permit the timely and safe connection of the FLEX and RRC equipment during the adverse conditions encountered during these beyond design basis events.	Started
OI-10: Design and construct a Flexible Equipment Storage Building(s), located above the probable maximum flood level, which meets the plant's design basis for the Safe Shutdown Earthquake and the plant's design basis for high wind hazards. This storage facility(s) will be used to store support equipment and items, including the four FLEX Pumping Systems and the three 4 kV FLEX DGs.	Started
OI-11: Design and install the modifications required by Order EA-13-109 for the Hardened Containment Vent System (HCVS).	Closed – Schedule for implementation in accordance with Order EA-13-109 and is not related to FLEX implementation, as was the case with previous Order-12-050.
OI-12: Design and install the modifications required by Order EA-12-051 for enhancing the SFP.	Started
OI-13: Determine the design specifications for FLEX equipment yet to be ordered, such as the Six Portable ventilation fans, the Mobil Water Purification Unit, debris removal equipment for the FLEX Equipment Haul path and piping for the FLEX low pressure pumps.	Started
OI-14: Deployment strategies and deployment routes will be assessed for impact due to identified hazards and guidance developed/provided to ensure that 1) sufficient area is available for deployment, 2) haul paths remain accessible without interference from outage equipment during refueling outages and 3) deployment locations for the pumps including ramps, winches or other transfer assemblies as appropriate to deploy all pumps and hoses within the 8 hour Phase 1 coping interval.	Started
OI-15: Detailed staffing studies based on the procedures/guidance developed.	Not started
OI-16. Validation of the time lines for the various strategies.	Not started

Overall Integrated Plan Open Item	Status
<p>OI-17: BFNP will utilize the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.</p>	<p>Started</p>
<p>OI-18: New training of general station staff and EP will be performed prior to the 1st BFNP unit design implementation outage. These programs and controls will be implemented in accordance with the Systematic Approach to Training.</p>	<p>Not started</p>
<p>OI-19: TVA will establish a contract with the Strategic Alliance for FLEX Emergency Response (SAFER) team. A local assembly area must also be established by SAFER and TVA for equipment moved from the Regional Response Center (RRC) to BFNP.</p>	<p>Closed</p> <p>References:</p> <ol style="list-style-type: none"> 1. Contract between Tennessee Valley Authority and Pooled Equipment Inventory Company (formerly known as BWR Equipment Inventory Company) for Pooled Inventory Management (Amended and Restated Participation Contract) 2. AREVA Technical data Record, 12-9216898-000, Regional Response Center Project

Draft Safety Evaluation Open Item	Status
<p>3.2.4.5.A - The licensee provided no information regarding local access to the protected areas under ELAP.</p> <p style="text-align: center;">AND</p> <p>RAI Item #38 - The licensee's integrated plan provided insufficient information regarding the development of guidance and strategies with regard to the access to the Protected Area and internal locked areas. Because insufficient information is provided, there is no reasonable assurance that the guidance and strategies developed will conform to the guidance of NEI 12-06 Section 3.2.2 consideration 9. Provide additional information related to the information described in NEI 12-06 Section 3.2.2 consideration 9.</p>	<p>Closed – The following information was added to Section 20 of the OIP, and submitted within this 6 month update:</p> <p><u>Protected Area and Vital Area Access</u></p> <p>BFN Nuclear Security maintains available, a Power Independent Alternate Power source ensuring that Security attributes can be maintained during a loss of all Plant Off-Site and On-Site AC power. If Nuclear Security's alternate power source is lost, then Nuclear Security has compensatory plans ready with actions prioritized. These plans are developed to continue site protective measures and support security related elements of an emergency response, including access to Plant Vital Areas through Security Locks and management of the Protected Area Vehicle Barrier System. In addition to these security compensatory plans, FLEX procedures will be screened for security related impediments and where applicable added measures will be afforded to ensure prompt implementation of a given strategy.</p>
<p>3.2.4.6.C - There is insufficient information provided in the Integrated Plan to demonstrate that potential high temperature/humidity on the refuel floor has been addressed with regard to habitability.</p>	<p>Started</p>

Draft Safety Evaluation Open Item	Status
<p>3.2.4.8.D - On pages 26, 42, and 54 of their Integrated Plan, the licensee stated plans to permanently stage three 480 volt FLEX diesel generators on the roof of the unit-specific, safety-related Diesel Buildings and three 4 kilovolt FLEX diesel generators in the protected Flexible Equipment Storage Building. The use of permanently staged generators appears to be an alternative to NEI 12-06. The licensee has not provided sufficient information to demonstrate that the approach meets the NEI 12-06 provisions for pre-staged portable equipment. Additional information is needed from the licensee to determine whether the proposed approach provides an equivalent level of flexibility for responding to an undefined event as would be provided through conformance with NEI 12-06.</p>	<p>Started</p>

7 Potential NRC Evaluation Impacts

There are two potential impacts to the NRC Evaluation identified at this time. These impacts are currently being evaluated by TVA.

1. TVA is evaluating potential changes to the capacity and storage options for the 3 MW diesels.
2. TVA is evaluating the need for relief regarding Order EA-12-049 FLEX/Order EA-13-109 containment venting interface.

8 References

The following references support the updates to the Overall Integrated Plan described in this attachment.

1. Letter from TVA to NRC, "Tennessee Valley Authority (TVA) - Overall Integrated Plan in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) for Browns Ferry Nuclear Plant," dated February 28, 2013 (ML13064A465)
2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A735)
3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" Revision 0, dated August 2012 (ML12242A378)
4. Letter from TVA to NRC, "First Six-Month Status Report in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) for Browns Ferry Nuclear Plant," dated August 28, 2013 (ML13247A284)
5. Letter from NRC to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0902, MF0903, and MF0904)," dated December 19, 2013 (ML13353A166)