



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

August 28, 2013

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: 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**

- 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)

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.

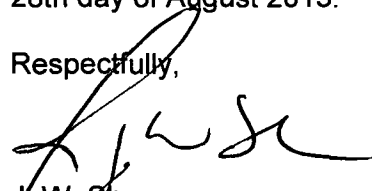
Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. The purpose of this letter is to provide the first six-month status report pursuant to Section IV, 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 overall integrated plan, including any changes to the compliance method or schedule.

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 August 2013.

Respectfully,



J. W. Shea  
Vice President, Nuclear Licensing

Enclosure  
cc: See Page 3

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Enclosure:

Tennessee Valley Authority Browns Ferry Nuclear Plant's First 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 FIRST 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**

## ENCLOSURE

### 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 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 July 30, 2013.

Unit 2 N-1 Walkdown

### 3 Milestone Schedule Status

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
<b>Submit Overall Integrated Plan</b>	February 2013	Complete	
<b>Submit 6 Month Updates:</b>			
Update 1	August 2013	Complete	
Update 2	February 2014	Not Started	
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	
<b>FLEX Strategy Evaluation</b>	June 2013	On Track	October 2013
<b>Unit 1 - Validation of connection points for FLEX Phase 2 &amp; 3 via walkthrough or demonstration. (Graded approach)</b>	November 2016 <sup>1</sup>	Not Started	

Activity	Original Target Date	Activity Status	Revised Target Completion Date
<b>Unit 2 - Validation of connection points for FLEX Phase 2 &amp; 3 via walkthrough or demonstration. (Graded approach)</b>	May 2015 <sup>1</sup>	Not Started	
<b>Unit 3 - Validation of connection points for FLEX Phase 2 &amp; 3 via walkthrough or demonstration. (Graded approach)</b>	April 2016 <sup>1</sup>	Not Started	
<b>Perform Staffing Analysis</b>	October 2014	Not Started	
<b>Modifications:</b>			
Modifications Evaluation	June 2013	On Track	October 2013
Unit 1 N-1 Walkdown	October 2014	Not Started	
Unit 1 Design Engineering	December 2014 <sup>1</sup>	On Track	
Unit 1 Implementation Outage	November 2016	Not Started	
Unit 2 N-1 Walkdown	March 2013	Complete	
Unit 2 Design Engineering	December 2014 <sup>1</sup>	On Track	
Unit 2 Implementation Outage	April 2015	Not Started	May 2015
Unit 3 N-1 Walkdown	February 2014	Not Started	
Unit 3 Design Engineering	December 2014 <sup>1</sup>	On Track	
Unit 3 Implementation Outage	April 2016	Not Started	
<b>Storage:</b>			
Storage Design Engineering	March 2014 <sup>1</sup>	On Track	
Storage Implementation	February 2015 <sup>1</sup>	Not Started	
<b>FLEX Equipment:</b>			
Procure On-Site Equipment	October 2013	On Track	
Develop Strategies with RRC	December 2013	Not Started	
Install Off-Site Delivery Station	May 2015 <sup>1</sup>	Not Started	
<b>Procedures:</b>			
BWROG issues FSG guidelines	January 2014	Not Started	
Create Browns Ferry FSGs	March 2014	Not Started	
Create Maintenance Procedures	June 2014	Not Started	
<b>Training:</b>			
Develop Training Plan	January 2014	Not Started	
Implement Training	March 2014	Not Started	
<b>Unit 1 FLEX Implementation</b>	November 2016	Not Started	
<b>Unit 2 FLEX Implementation</b>	April 2015	Not Started	May 2015
<b>Unit 3 FLEX Implementation</b>	April 2016	Not Started	
<b>Full Site FLEX Implementation</b>	November 2016	Not Started	
<b>Submit Completion Report</b>	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). These changes meet the NEI 12-06 compliance method.

- 4.1 **(Section 11, Section 14, Section 17 and Section 18, 3.b.ii, Note)** was changed to read as follows:

“Note: The B RHRSW inlet header can provide standby coolant to unit 2 and/or unit 3, if needed.”

- 4.2 **(Section 11, Section 14, Section 17 and Section 18, 3.b.iii, Note)** was changed to read as follows:

“Note: The D RHRSW inlet header can provide standby coolant to unit 1 and/or unit 2, if needed.”

- 4.3 **(Section 11d Severe Storms with High Winds, Section 14d Severe Storms with High Winds, Section 20d Severe Storms with High Winds)** changed to read as follows:

“Portable equipment required to implement this FLEX strategy will be maintained in the FESB, which is designed to meet or exceed the licensing basis high wind hazard for BFNP, with the exception of the 480 V FLEX DGs. An extreme tornado could exceed the protection limits for more than one 480 V FLEX DG. (A beyond-design-basis tornado for BFNP would exceed 300MPH; protection for the FLEX DGs shall be designed to 230 MPH based on NRC region 1 tornado, missiles, and velocities defined in NRC Regulatory Guide 1.76 Revision 1). The 480 V FLEX DGs shall be protected from other beyond-design-basis events listed in Section 1.”

This change complies with the guidelines contained in Reference 3 in Section 8.

- 4.4 **(Section 13, last paragraph)** changed to read as follows:

“The containment vent system is not credited for Phase 1; however, modifications to the containment vent system are planned in response to NRC Order EA-13-109 (Ref. 2). (Open Item, OI 11)”

This change complies with the guidelines contained in Reference 3 in Section 8.

- 4.5 **(Section 13b)** was changed to read as follows:

“Hardened Containment Vent System (HCVS) (i.e., Reliable Hardened Vent) is currently installed but will be enhanced in accordance with NRC Order EA-13-109 (Ref. 2). (Open Item, OI 11).”

This change complies with the guidelines contained in Reference 3 in Section 8.

- 4.6 **(Section 13 & 14 Reference Sections)** Changed reference from EA-12-050 to EA-13-109.

This change reflects cancellation of NRC Order EA-12-050.

- 4.7 **(Section 14, 2.c.i)** was changed to read as follows:

“DC power and pneumatic supply in accordance with NRC Order EA-13-109 (Ref. 5). (Open Item, OI 11), and”

This change reflects cancellation of NRC Order EA-12-050.

- 4.8 **(Section 14b, last bullet)** changed to read as follows:

“Install a Hardened Containment Vent System (HCVS) as required by NRC Order EA-13-109. Interim modifications may be made on Unit 2 and Unit 3 for FLEX usage, as guidance for compliance with NRC Order EA-13-109 is further developed. (Ref. 5)”.

This change reflects cancellation of NRC Order EA-12-050.

- 4.9 **(Section 17d, Severe Storms with High Winds)** changed to read as follows:

“The piping used to provide makeup flow to the SFP is contained within buildings that are protected from storms and high winds. Portable equipment required to implement this FLEX strategy will be maintained in the FESB, which is designed to meet or exceed the licensing basis high wind hazard for BFNP, with the exception of the 480 V FLEX DGs. An extreme tornado could exceed the protection limits for more than one 480 V FLEX DG. (A beyond-design-basis tornado for BFNP would exceed 300MPH; protection for the FLEX DGs shall be designed to 230 MPH based on NRC region 1 tornado, missiles, and velocities defined in NRC Regulatory Guide 1.76 Revision 1). The 480 V FLEX DGs shall be protected from other beyond-design-basis events listed in Section 1.”

This change complies with the guidelines contained in Reference 3 in Section 8.

- 4.10 **(Attachment 5, Open Item 11)** changed to read as follows:

“Design and install interim modifications to the containment vent system to support use of the system in support of FLEX strategies. The interim modification is being performed as the industry develops guidance to comply 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.”

This change reflects cancellation of NRC Order EA-12-050.

## **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.	Not Started
OI-2: Liquefaction of haul routed 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 .	Not 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.	Not 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.	Not 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.	Not started
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, 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 will be used to store support equipment and items, including the four FLEX Pumping Systems and the three 4 kV FLEX DGs.	Started

Overall Integrated Plan Open Item	Status
OI-11: Design and install the modifications required by Order EA-13-109 for the Hardened Containment Vent System (HCVS). This will include modifying the HCVS system to permit controlled venting more than one unit at the same time, if necessary.	Started
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
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.	Started
OI-18: New training of general station staff and EP will be performed prior to the 1 <sup>st</sup> BFNP unit design implementation outage. These programs and controls will be implemented in accordance with the Systematic Approach to Training.	Not started
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.	Started

Draft Safety Evaluation Open Item	Status
None received at his time	N/A

**7 Potential NRC Evaluation Impacts**

There are no potential impacts to the NRC Evaluation identified at this time.

**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
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
3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide"