



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

CNL-14-134

August 28, 2014

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10 CFR 50.4

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

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

Watts Bar Nuclear Plant, Unit 2  
Construction Permit No. CPPR-92  
NRC Docket No. 50-391

Subject: **Third 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 Watts Bar Nuclear Plant (TAC Nos. MF0950 and MF1177)**

- References:
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 Watts Bar Nuclear Plant," dated February 28, 2013 (ML13067A030)
  2. Letter from TVA to NRC, "First Six-Month Status Report in Response to 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 Watts Bar Nuclear Plant," dated August 28, 2013 (ML13247A288)
  3. Letter from NRC to TVA, "Watts Bar Nuclear Plant, Units 1 and 2 - Interim Staff Evaluation Relating to Overall Intergraded Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0950 and MF1177)," dated December 20, 2013 (ML13343A025)

4. Letter from TVA to NRC, "Revised 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 Watts Bar Nuclear Plant (TAC Nos. MF0950 and MF1177)," dated February 7, 2014 (ML14062A050)
5. Letter from TVA to NRC, "Response to NRC Staff Audit Question Clarification for Watts Bar Nuclear Plant, Units 1 and 2 Mitigation Strategies Integrated Plan, Phase 2 Electrical Strategy (TAC Nos. MF0950 and MF1177)," dated March 28, 2014

On February 28, 2013, the Tennessee Valley Authority (TVA) submitted an Overall Integrated Plan (OIP) in response to the March 12, 2012, Commission Order modifying licenses with regards to requirements for mitigation strategies for beyond-design-basis external events, Order number EA-12-049, for the Watts Bar Nuclear Plant (WBN), Units 1 and 2 (Reference 1). On August 28, 2013, TVA provided the first six-month status report to the OIP (Reference 2).

The OIP submitted in Reference 1 employed a strategy using reactor coolant pump (RCP) low leakage seals. TVA revised its strategy to use the existing conventional RCP seals. This change in RCP seals required a revision to the OIP submitted by Reference 1. These changes were presented and discussed with the Nuclear Regulatory Commission (NRC) through the mitigation strategies audit process. Based on a review of TVA's plan, including the six-month update, and information obtained through the mitigation strategies audit process, the NRC concluded in its Interim Staff Evaluation that the plan, when properly implemented, will meet the requirements of Order EA-12-049 at WBN, Units 1 and 2 (Reference 3). The Interim Staff Evaluation included two open items. Open item 3.2.1.6.A required revision to the Sequence of Events due to use of the conventional RCP seals, for reanalysis by the NRC. On February 7, 2014, TVA provided the revised OIP (Reference 4) which included the required revision to the Sequence of Events. Reference 4 also served as the second six-month status report.

The second open item, 3.2.4.8.A, required resolution for justification regarding use of pre-staged diesel generators. TVA provided the justification regarding use of pre-staged diesel generators on March 28, 2014 (Reference 5).

The purpose of this letter is to provide the third six-month status report to the OIP. Specifically, the Enclosure of this letter provides the third six-month status report. This status report updates the status to the OIP "Open Items" table. The remaining OIP open items 4, 9, 10, 12, and 13 are closed. OIP Attachment 2, "Milestone Schedule," has been updated and revised as noted in the revised target completion date column.

U.S. Nuclear Regulatory Commission  
Page 3  
August 28, 2014

If you have any questions regarding this report, 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 2014.

Respectfully,

**J. W. Shea**  
Digitally signed by J. W. Shea  
DN: cn=J. W. Shea, o=Tennessee  
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Date: 2014.08.28 19:33:02 -04'00'

J. W. Shea  
Vice President, Nuclear Licensing

Enclosure:

Tennessee Valley Authority Watts Bar Nuclear Plant's Third 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  
NRR JLD Director - NRC Headquarters  
NRC Regional Administrator - Region II  
NRR Project Manager - Watts Bar Nuclear Plant  
NRC Senior Resident Inspector - Watts Bar Nuclear Plant  
NRR Mitigation Strategies Director - NRC Mitigation Strategies Directorate

**ENCLOSURE**

**TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT  
THIRD 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**

### **Introduction**

Tennessee Valley Authority (TVA) developed an Overall Integrated Plan (Reference 1 in Reference section of this enclosure) for Watts Bar Nuclear Plant (WBN), Units 1 and 2, documenting the diverse and flexible strategies (FLEX), in response to Reference 2. TVA provided a revised OIP on February 7, 2014 (Reference 3). This attachment provides an update of milestone accomplishments since submittal of the revised OIP (Reference 3) , including any changes to the compliance method or schedule.

### **Milestone Accomplishments**

The following milestone(s) have been completed since submittal of the revised OIP (Reference 3), and are current as of July 31, 2014.

Unit 1 Implementation Outage (FLEX mechanical and electrical connections)  
Unit 2 Design Engineering

### **Milestone Schedule Status**

The following provides an update to Attachment 2 of the OIP. The activity status of each item is provided, as well as any change to the expected completion date. The dates are planning dates subject to change as design and implementation details are developed.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
<b>Submit 60 Day Status Report</b>	Oct 2012	Complete	
<b>Submit Overall Integrated Plan</b>	Feb 2013	Complete	
<b>Submit 6 Month Updates:</b>			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	Aug 2014	Complete	
<b>FLEX Strategy Evaluation</b>	June 2013	Complete	
<b>Walk-throughs or Demonstrations</b>	Sep 2014	In Progress	
<b>Perform Staffing Analysis</b>	Jun 2014	Complete	
<b>Modifications:</b>			
Modifications Evaluation	Apr 2013	Complete	
Unit 1 N-1 Walkdown	Apr 2013	Complete	
Unit 1 Design Engineering	Oct 2013	Complete	
Unit 1 Implementation Outage	May 2014	Complete	
Unit 2 Construction Walkdown	Apr 2013	Complete	
Unit 2 Design Engineering	Feb 2014	Complete	
Unit 2 Implementation (Startup)	Aug 2014	On Track	Sep 2014
<b>Storage</b>			
Storage Design Engineering		Complete	
Storage Implementation	Aug 2014	On Track	Sep 2014
<b>On-Site FLEX Equipment</b>			
Procure	Feb 2014	On Track	Sep 2014
<b>Off-Site FLEX Equipment</b>			
Develop Strategies with RRC	Jun 2014	On Track	Sep 2014
Install Off-site Delivery Station	Apr 2014	On Track	Sep 2014
<b>Procedures:</b>			
PWROG issues NSSS-specific guidelines	Jun 2013	Complete	
Create Site-Specific FSIs	Apr 2014	On Track	Sep 2014
Create Maintenance Procedures	Apr 2014	On Track	Sep 2014
<b>Training:</b>			
Develop Training Plan	Apr 2014	Complete	
Training Complete	Jul 2014	On Track	Sep 2014
<b>Unit 1 FLEX Implementation</b>	Aug 2014	On Track	Sep 2014
<b>Unit 2 FLEX Implementation</b>	Aug 2014	On Track	Sep 2014
<b>Full Site FLEX Implementation</b>	Aug 2014	Not Started	Mar 2015 <sup>1</sup>
<b>Submit Completion Report</b>	Aug 2014	Not Started	Mar 2015 <sup>1</sup>
1 - Full site FLEX implementation is tied to 30 days prior to U2 Operating License to allow for completion of pre-operational testing of U2 components.			

## Changes to Compliance Method

There have been no changes to the compliance methods since submittal of the revised OIP in Reference 3.

## Need for Relief and Basis for the Relief

Watts Bar expects to comply with the order implementation date and no relief is required at this time.

## Open Items from Overall Integrated Plan and NRC Evaluation

The following table provides a summary of the open items documented in the OIP or the NRC Evaluation and the status of each item.

Open Item Number	Description	Status
1	The current Condensate Storage Tank (CST) is a non-seismic tank that is not missile protected. The site is currently pursuing two options; the qualification and hardening of the existing CST or the construction of a new seismically qualified and missile protected CST. One of these options must be completed before the volume of the CST can be credited.	Closed  A new qualified Auxiliary Feedwater Supply Tank (AFWST) will be used instead of using the Condensate Storage Tank (CST) for FLEX.
2	Liquefaction of haul routes for FLEX will be analyzed.	Closed  Reference WBN White Paper (EDMS 24900-100-KOR-CY00-00001)
3	No detailed analysis has been provided regarding initial FLEX fuel supplies to determine a need time for access to 7 day tank supplies or resupply of the 7 day tanks. It is assumed that each FLEX component is stored with a minimum supply of 8 hours of fuel at constant operation. This assumption will need to be assessed once all FLEX equipment has been purchased and equipment specifications are known.	Closed  Fuel consumption spreadsheet completed to show that fuel supply of equipment will last seven days.
4	No need time has been identified for action to protect containment. This includes actions to mitigate pressurization of containment due to steaming when reactor coolant system (RCS) vent paths have been established or actions to mitigate temperature effects associated with equipment survivability. An evaluation will be provided to prove indefinite containment coping.	Closed  Reference LTR-ISENG-14-1, Rev 0

Open Item Number	Description	Status
5	The Phase 3 equipment staging area has not been determined.	Closed  Areas are identified and will be included with the SAFER National Response Center playbook
6	A strategy for clearing and removing debris will be determined.	Closed  Debris removal equipment is identified and storage determined.
7	A thorough analysis of the makeup flow rate requirements and other equipment characteristics will be finalized during the detailed design phase of FLEX.	Closed  Detailed FLEX Operating Conditions and pump sizing has been completed  Reference CN-SEE-II-13-26, Rev 1
8	The need time for spent fuel pool (SFP) cooling actions (deployment of hose, venting, and alignment of makeup) was determined using worst case heat loads. This item will continue to be assessed and later action times may be acceptable. Note that the timing for this step during an outage is different, but resources will be available to complete the required actions.	Closed  Reference CN-SEE-II-12-40, Rev 3
9	Functional requirements for each of the Phase 3 strategies, equipment and components will be completed at a later time and will be provided in the six month updates to the February 28, 2013 submittal.	Closed  Reference WBN SAFER National Response Center Playbook
10	Containment temperature instrumentation is only available until flood waters enter the technical support center (TSC) inverter or station battery rooms. A method to monitor containment temperature, post-flood, will be developed.	Closed  Reference LTR-ISENG-14-1, Rev 0
11	The heating, ventilation and air conditioning (HVAC) analysis is preliminary, and has not been finalized.	Closed  Reference Calculation MDQ0003602012000272
12	Verify ability to deploy FLEX equipment to provide core cooling in Modes 5 and 6 with steam generators (SGs) unavailable.	Closed  Reference NPG-SPP-07.2.11, Rev 5



Open Item Number	Description	Status
13	An evaluation of the impact of FLEX response actions on design basis flood mode preparations will be performed. This evaluation will include the potential for extended preparation time for FLEX. Changes which affect the Integrated Plan will be included in the six month update.	Closed  TVA's River Systems Operation (RSO) will notify the WBN control room if Watts Bar Hydro instantaneous flow rate reaches 170,000 cfs, which approximates the 25 year flood frequency based upon observed historical flow data. This notification will provide for initiation and completion of preparatory FLEX equipment deployment and mitigation strategy implementation prior to conditions that might trigger a Stage 1 Flood Warning from RSO.
14	Further analysis will be performed to determine the required timeline for implementing the 3 MWe diesel generators (DGs) as an alternate power source for the loads supplied by the 225 kva 480 Vac DGs.	Closed  The 3 MWe DGs are available within 8 hours. A line will be added to 225 kva timing to state that if 225s not available, then 3 MWe to be started.
15	The CETs are only available until water enters the auxiliary instrument room. A method to monitor CET, post flood, will be evaluated and developed, if required.	Closed  CETs will not be required for flood event.
16	Strategies to address extreme cold conditions on the refueling water storage tank (RWST) and/or boric acid tanks (BATs), including potential need to reenergize heaters have not been finalized.	Closed  Reference Westinghouse LTR-SEE-11-14-44, Rev 0
17	Establish a contract with the Strategic Alliance for FLEX Emergency Response (SAFER) team in accordance with the requirements of Section 12 of NEI 12-06.	Closed  Agreement with SAFER National Response Center is in place.
18	Manual station blackout (SBO) load shedding time in References 4 and 5, Section 8.3.2.1.1, will be revised from 30 minutes to 45 minutes as supported by the 8 hour extended loss of alternating current power (ELAP) battery calculations.	Closed  Reference TVA EDQ00023620070003 Rev 28 and EPMMA041592 Rev 20

## **Potential NRC Evaluation Impacts**

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

## **References**

The following references support the updates to the OIP described in this enclosure.

1. Letter from TVA to NRC, "Watts Bar's Overall Integrated Plan in Response to 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 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. Letter from TVA to NRC, "Revised 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 Watts Bar Nuclear Plant (TAC Nos. MF0950 and MF1177)," dated February 7, 2014 (ML14062A050)
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