



**Luminant**

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Log # TXX-15124

REF 10 CFR 2.202

August 27, 2015

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

**SUBJECT:** Comanche Peak Nuclear Power Plant, Docket Nos. 50-445 AND 50-446, Fifth 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) (TAC NOS. MF0860 and MF0861)

- REFERENCES:**
1. 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
  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
  3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012
  4. Luminant Generation Company LLC's Letter TXX-12158, Initial 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), dated October 25, 2012
  5. Luminant Generation Company LLC's Letter TXX-13030, 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

Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) staff issued an order (Reference 1) to Luminant Generation Company LLC (Luminant Power). Reference 1 was immediately effective and directs Luminant to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of 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,

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Condition C. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided Luminant Power's initial status report regarding mitigation strategies. Reference 5 provided Luminant Power's 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 fifth 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 attached report provides an update of milestone accomplishments since the overall integrated plan was submitted (Reference 5), including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments.

If you have any questions regarding this report, please contact Carl B. Corbin at 254-897-0121 or carl.corbin@luminant.com.

I state under penalty of perjury that the foregoing is true and correct.

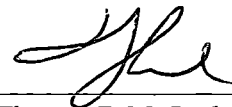
Executed on August 27, 2015.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By:



Thomas P. McCool  
Vice President  
Engineering and Support

Attachment: Comanche Peak Nuclear Power Plant's (CPNPP) Fifth 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

c - William M. Dean, Director, Office of Nuclear Reactor Regulation  
Marc L. Dapas, Region IV  
Jessica A. Kratchman, NRR/JLD/PMB  
Balwant K. Singal, NRR  
Stephen A. Monarque, NRR  
Resident Inspectors, Comanche Peak Nuclear Power Plant

**Comanche Peak Nuclear Power Plant's (CPNPP) Fifth 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**

Comanche Peak Nuclear Power Plant (CPNPP) developed an Overall Integrated Plan (Reference 1), 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 and the First, Second, Third and Fourth Six Month Status Reports (References 3, 7, 11 and 12), including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

## **2 Milestone Accomplishments**

The following milestone(s) have been completed since the development of the Overall Integrated Plan (Reference 1), and are current as of August 17, 2015.

- FLEX Strategy Evaluation - Complete
- Modifications Evaluations - Complete
- Storage Design Engineering - Complete
- Procedures - PWROG issues NSSS-specific guidelines - Complete
- National Safer Response Center (NSRC) Operational - Complete
- Develop Training Plan - Complete
- Perform Phase 2 Staffing Study - Complete
- Develop Unit 2 Modifications - Complete
- Develop Site Response Plan with NSRC - Complete

## **3 Milestone Schedule Status**

The following table provides an update to Attachment 2 of the Overall Integrated Plan (OIP). 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. Note, italicized items in the following table were not provided as milestone items in Attachment 2 of the OIP. However, these items are added here for consistency with the 6 month status update template and will be carried forward in future 6 month status updates.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	Oct 2012	Complete	
Submit Overall Integrated Plan	Feb 2013	Complete	
<b>Submit 6 Month Updates:</b>			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	Aug 2014	Complete	
Update 4	Feb 2015	Complete	
Update 5	Aug 2015	Complete	
<i>FLEX Strategy Evaluation</i>	<i>Aug 2013</i>	<i>Complete</i>	
<i>Walk-throughs or Demonstrations</i>	<i>Apr 2015</i>	<i>Started</i>	<i>Sep 2015</i>
Perform Phase 2 Staffing Analysis	Jun 2014	Complete	Jun 2015
<b>Modifications:</b>			
<i>Modifications Evaluation</i>	<i>Aug 2013</i>	<i>Complete</i>	
Develop Unit 1 Modifications	Mar 2014	Started	Sep 2015
Unit 1 Implementation Outage (1RF18)	Oct 2014	Not Started	May 2016
Develop Unit 2 Modifications	Mar 2015	Complete	Jul 2015
Unit 2 Implementation Outage (2RF15)	Oct 2015	Not Started	
<b>Storage:</b>			
<i>Storage Design Engineering</i>	<i>Mar 2014</i>	<i>Complete</i>	
<i>Storage Implementation</i>	<i>Feb 2015</i>	<i>Started</i>	<i>Sep 2015</i>
<b>FLEX Equipment:</b>			
Procure On-Site Equipment	Jul 2015	Started	Sep 2015
Develop Site Response Plan with NSRC	Apr 2015	Complete	Aug 2015
<i>Install Off-Site Delivery Station (if Necessary)</i>	<i>Not Required</i>	<i>Not Required</i>	<i>Not Required</i>
National Safer Response Center Operational	Aug 2014	Complete	
<b>Procedures:</b>			
<i>PWROG issues NSSS-specific guidelines</i>	<i>May 2013</i>	<i>Complete</i>	
Issue FSGs	Aug 2014	Started	Oct 2015
Create Maintenance Procedures	Jul 2014	Started	Oct 2015
<b>Training:</b>			
<i>Develop Training Plan</i>	<i>May 2014</i>	<i>Complete</i>	<i>Dec 2014</i>
Implement Training	Apr 2015	Started	Sep 2015
<i>Full Site FLEX Implementation</i>	<i>Oct 2015</i>	<i>Started</i>	<i>Apr 2016</i>
Submit Completion Report	Feb 2016	Not Started	Aug 2016

#### **4 Changes to Compliance Method**

The following are either changes or clarifications to the compliance method and are in addition to those identified in the First, Second, Third and Fourth Six Month Status Reports (References 3, 7, 11 and 12).

##### Debris Removal

On pages 7 and 78 of the OIP, it is implied that debris removal required to deploy FLEX equipment will be completed within 6 hours of ELAP initiation. However, minimum staffing does not permit debris removal to begin until 6 hours, when limited site access is restored. It is not expected that initiation of debris removal at 6 hours will adversely impact the deployment times associated with successful FLEX strategy implementation. However, validation of FLEX strategies is ongoing and any adverse impacts of initiating debris removal at 6 hours will be identified and resolved.

##### Ground Test Well for Phase 2 480V Generator

Contrary to page 50 of the OIP, a ground test well will not be installed at the Phase 2 480V generator staging location. Review of the proposed modification determined the ground test well was not required.

##### Spent Fuel Pool Time to Boil and Associated Actions - Modes 1 through 4

As discussed on page 40 of the OIP, the spent fuel pool (SFP) time to boil value (7 hours) was determined using a conservative overestimation of the normal operating decay heat load. The SFP time to boil determination was re-evaluated to arrive at a nominal but still conservative SFP time to boil of 14 hours. The related operator action time to ventilate the Fuel Building and deploy any equipment local to the SFP area necessary for implementation of the backup SFP makeup strategy is therefore revised to 14 hours. Similarly, the associated duration for SFP boiloff to within 15 feet above the top of the spent fuel racks is 45 hours (from ELAP initiation), and consequently, the operator action time to initiate SFP makeup is also 45 hours. The previous time to boil values and operator response times are discussed on pages 7-8, 40-41, and 78-79 of the OIP.

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

In Reference 5, Luminant formally requested relief from the requirement of Section IV.A.2 of the Order (EA-12-049) regarding full implementation no later than two (2) refueling cycles after submittal of the Overall Integrated Plan. NRC approval of the requested relief was received in Reference 8, relaxing full order implementation for Comanche Peak Unit 1 until the completion of the spring 2016 refueling outage. Full order implementation for Comanche Peak Unit 2 is unchanged and will occur upon completion of the fall 2015 refueling outage. The milestone schedule in Section 3 has been updated for consistency with the approved schedule relief. No additional relief is requested herein.

## 6 Open Items from Overall Integrated Plan and Draft Safety Evaluation

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

Overall Integrated Plan Open Items	Status
<p>OI1. Finalize location and protection requirements of FLEX storage buildings. The storage buildings will be designed in accordance with the NEI guidance and the applicable hazards.</p>	<p>Complete. FLEX equipment will be stored in a new single structure designed as described in Section 4 of Reference 7.</p>
<p>OI2. Perform containment evaluation based on the boundary conditions described in Section 2 of NEI 12-06. Based on the results of this evaluation, required actions to ensure maintenance of containment integrity and required instrument function will be developed as necessary.</p>	<p>Complete. The containment analysis concludes no significant heatup or pressurization of containment as a result of an ELAP when crediting SHIELD. Per Reference 13, the NRC has reviewed the containment analysis, found no discrepancies and closed the associated confirmatory items noted in Reference 4. No further action required.</p>
<p>OI3. Development of refueling equipment specifications, determination of fuel consumption rates, assessment of fuel supplies and determination of time frames for refueling of FLEX equipment in Phases 2 and 3 will be developed following generation of specifications for FLEX equipment.</p>	<p>Development of final specifications for all FLEX equipment has started.</p>
<p>OI4. Finalize FLEX strategies and required modifications following resolution of low-leakage RCP seal performance issue.</p>	<p>Comanche Peak FLEX strategies credit the use of SHIELD low-leakage seals as approved in Reference 9. Preparation of design modifications for installation of SHIELD are in progress.</p>

Draft Safety Evaluation and Interim Staff Evaluation (ISE) are assumed synonymous. The following are additional Open Items documented in the Interim Staff Evaluation (Reference 4). These open items will be carried forward in future 6 month status updates until confirmation is received from the NRC that the items may be closed. Luminant Power is participating in the voluntary NRC audit process described in References 6 and 13.

Interim Staff Evaluation Open Items	Status
<p>3.2.1.2.A</p> <p>Regarding the RCP seals, the only O-ring of interest with the safe shutdown low-leakage (SHIELD) installed is the RCP seal sleeve to shaft O-ring. Qualification of the RCP seal sleeve to shaft O-ring will be tracked as part of the SHIELD redesign to confirm the delayed cooldown, as documented in the Integrated Plan, is acceptable. CPNPP will align with testing results to be documented in the forthcoming SHIELD white paper.</p>	<p>Reference 9 documents NRC acceptance of SHIELD for use in ELAP evaluations. Luminant has confirmed the reactor coolant system pressure and temperature limits of Reference 9 will be met during an ELAP event at Comanche Peak. However, per Reference 13, this item remains open pending NRC review of the reactor coolant pump O-ring material.</p>
<p>3.2.1.2.C</p> <p>If the RCP seals are changed to the newly designed Generation 3 SHIELD seals, or non-Westinghouse seals, the acceptability of the use of the newly designed Generation 3 SHIELD seals, or non-Westinghouse seals should be addressed, and the RCP seal leakages rates for use in the ELAP analysis should be provided with acceptable justification. During the audit process the licensee stated that CPNPP uses the Westinghouse model93A RCPs crediting SHIELD for FLEX strategies. Testing and qualification of SHIELD is ongoing and the licensee is closely following the re-design of SHIELD and will modify analyses and FLEX strategies if needed, based on the conclusions of the SHIELD white paper.</p>	<p>Reference 9 documents NRC acceptance of SHIELD for use in ELAP evaluations. Item 4 of the limitations and conditions from Reference 9 restricts the seal leakage rate to a constant 1.0 gallon per minute after SHIELD actuation. Any deviation from this restriction will be justified.</p>
<p>3.2.1.8.A</p> <p>The Pressurized Water Reactor Owners Group (PWROG) submitted to NRC a position paper, dated August 15, 2013 (ADAMS Accession No. ML 13235A 132, non-public, proprietary), which provides test data regarding boric acid mixing under single-phase natural circulation conditions and outlines applicability conditions intended to ensure that boric acid addition and mixing would occur under conditions similar to those for which boric acid mixing data is available. However, the NRC staff concluded that the August 15, 2013, position paper was not adequately justified and did not endorse this position paper. As such, ensuring adequate mixing of boric acid into the RCS under ELAP conditions is an open item for CPNPP.</p>	<p>Per Reference 10, the NRC has endorsed the PWROG position paper with restrictions. Luminant has evaluated the impact of these restrictions on the CPNPP FLEX boration strategy and confirmed <math>k_{eff}</math> will be maintained less than 0.99 throughout an ELAP event.</p>

## 7 Potential Draft Safety Evaluation Impacts

Any potential impact to the Interim Staff Evaluation has been previously discussed in Section 4 of this letter.

## 8 References

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

1. Comanche Peak Nuclear Power Plant Docket Nos. 50-445 and 50-446 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. Comanche Peak Nuclear Power Plant, Docket Nos. 50-445 and 50-446, 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) (TAC Nos. MF0860 and MF0861), dated August 28, 2013.
4. NRC Interim Staff Evaluation, "Comanche Peak Nuclear Power Plant, Units 1 And 2 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0860 and MF0861)," dated December 19, 2013.
5. Comanche Peak Nuclear Power Plant (CPNPP), Docket Nos. 50-445 and 50-446, Request for Schedule Relaxation for 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) (TAC Nos. MF0860 and MF0861), dated February 12, 2014.
6. NRC Letter from Jack R. Davis to All Operating Reactor Licensees and Holders of Construction Permits, "Nuclear Regulatory Commission Audits of Licensee Responses to Mitigation Strategies Order EA-12-049," August 28, 2013.
7. Comanche Peak Nuclear Power Plant, Docket Nos. 50-445 and 50-446, Second 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) (TAC Nos. MF0860 and MF0861), dated February 27, 2014.
8. NRC Letter from Eric J. Leeds to Mr. Rafael Flores, "Comanche Peak Nuclear Power Plant, Unit 1 - Relaxation of Certain Schedule Requirements for Order EA-12-049 Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events," April 14, 2014.
9. NRC Letter from Jack Davis to Mr. James A. Gresham, ADAMS Accession No. ML14132A128, May 28, 2014.
10. NRC Letter from Jack Davis to Mr. Jack Stringfellow, ADAMS Accession No. ML13276A183, January 8, 2014.



11. Comanche Peak Nuclear Power Plant, Docket Nos. 50-445 and 50-446, Third 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) (TAC Nos. MF0860 and MF0861), dated August 28, 2014.
12. Comanche Peak Nuclear Power Plant, Docket Nos. 50-445 and 50-446, Fourth 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) (TAC Nos. MF0860 and MF0861),” dated February 26, 2015.
13. NRC Letter from Stephen Monarque to Mr. Rafael Flores, “Comanche Peak Nuclear Power Plant, Units 1 and 2 - Report for the Audit Regarding Implementation of Mitigating Strategies Related to Order EA-12-049 (TAC Nos. MF0860 and MF0861), dated August 5, 2015.