



Order No. EA-12-049

RS-13-113

August 28, 2013

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

Braidwood Station, Units 1 and 2  
Facility Operating License Nos. NPF-72 and NPF-77  
NRC Docket Nos. STN 50-456 and STN 50-457

**Subject:** 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)

**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
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. Exelon Generation Company, LLC's 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. Exelon Generation Company, LLC 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 (RS-13-017)

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to Exelon Generation Company, LLC (EGC). Reference 1 was immediately effective and directs EGC 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, 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 the EGC initial status report regarding mitigation strategies. Reference 5 provided the Braidwood Station, Units 1 and 2 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 the last status report, 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 David P. Helker at 610-765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28<sup>th</sup> day of August 2013.

Respectfully submitted,



Glen T. Kaegi  
Director - Licensing & Regulatory Affairs  
Exelon Generation Company, LLC

Enclosure:

1. Braidwood Station, Units 1 and 2 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: Director, Office of Nuclear Reactor Regulation  
NRC Regional Administrator - Region III  
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**Enclosure**

**Braidwood Station, Units 1 and 2**

**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**

(9 pages)

## Braidwood Station, Units 1 and 2

### 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

#### 1 Introduction

Braidwood Station developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This enclosure provides an update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

#### 2 Milestone Accomplishments

None

#### 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.

Site: Braidwood

Original Target Completion Date	Activity	Status	Revised Target Completion Date
	Submit 60 Day Status Report	Complete	
	Submit Overall Integrated Implementation Plan	Complete	
	Contract with Regional Response Center (RRC)	Complete	
	Submit 6 month Updates		
Aug 2013	Update 1	Complete with this submittal	
Feb 2014	Update 2	Not Started	
Aug 2014	Update 3	Not Started	
Feb 2015	Update 4	Not Started	
Aug 2015	Update 5	Not Started	

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Original Target Completion Date		Activity	Status	Revised Target Completion Date
Unit 1	Unit 2	Modification Development		
Feb 2014	Sept 2014	<ul style="list-style-type: none"> <li>Phase 1 modifications</li> </ul>	Conceptual Designs Complete. Detailed Designs Started.	
Feb 2014	Sept 2014	<ul style="list-style-type: none"> <li>Phase 2 modifications</li> </ul>	Conceptual Designs Complete. Detailed Designs Started.	
Feb 2014	Sept 2014	<ul style="list-style-type: none"> <li>Phase 3 modifications</li> </ul>	Not Started	
Unit 1	Unit 2	Modification Implementation		
Apr 2015	Oct 2015	<ul style="list-style-type: none"> <li>Phase 1 modifications</li> </ul>	Not Started	
Apr 2015	Oct 2015	<ul style="list-style-type: none"> <li>Phase 2 modifications</li> </ul>	Not Started	
Apr 2015	Oct 2015	<ul style="list-style-type: none"> <li>Phase 3 modifications</li> </ul>	Not Started	
		Procedure Development		
Apr 2015		<ul style="list-style-type: none"> <li>Strategy procedures</li> </ul>	Started	
Apr 2015		<ul style="list-style-type: none"> <li>Validate Procedures (NEI 12-06, Sect. 11.4.3)</li> </ul>	Not Started	
Apr 2015		<ul style="list-style-type: none"> <li>Maintenance procedures</li> </ul>	Not Started	
Jan 2015		Staffing analysis	Not Started	
Apr 2015		Storage Plan and construction	Started	
Apr 2015		FLEX equipment acquisition	Not Started	
Apr 2015		Training completion	Not Started	
Dec 2014		Regional Response Center Operational	Not Started	
Apr 2015		Unit 1 Implementation date	Not Started	
Oct 2015		Unit 2 Implementation date	Not Started	

#### 4 Changes to Compliance Method

##### **Braidwood FLEX Integrated Plan Changes (Reference 1).**

##### **Change 1**

Section: General Integrated Plan Elements PWR - Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint.

Reason for Change: Modification design details were refined as parts of the standardized modification design process and manual actions have been added and verified to accomplish these tasks.

Change: The time from step initiation to completion is now 5 to 50 minutes

##### **Change 2**

Section: General Integrated Plan Elements PWR - Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint.

Reason for Change: The information within this section was incorrectly tied to the references within that section.

Change: The (1) one hour time constraint is based on the results of MAAP analysis BW-MISC-009, dated Nov 1, 2011.

Change: The 3.6 hour time constraint is based on the results of EC Evaluation 391834 dated Feb 8, 2013.

##### **Change 3**

Section: General Integrated Plan Elements PWR - Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint.

Reason for Change: Change the cool down rate wording to be consistent throughout the Braidwood FLEX integrated plan.

Change: 1.5 hours – The control room will begin to direct a cooldown of the RCS by local operation of the S/G PORVs and local control of the AF flow control valves to reduce S/G pressure down to at least 300 psia at approximately 75°F/hr.

#### **Change 4**

Section: General Integrated Plan Elements PWR - Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint.

Reason for Change: Multiple operators may be used to perform this evolution instead of the implied single operator.

Change: After the Station DGs have been verified not available an operator is dispatched to the Div 2 ESF Switchgear Bus \_32X and verifies all breakers are open. The same operator or an additional operator will proceed to the FLEX Building to prep and align the FLEX DG to the station connections.

#### **Change 5**

Section: Maintain Core Cooling & Heat Removal, PWR Installed Equipment Phase 1.

Reason for Change: The timeline expectation is for operators to start a cool down within 90 minutes of the event initiation, not to complete the cool down within 90 minutes as stated. This change is to align the wording in this section to be consistent with the expectations.

Change: Within 90 minutes, operators will commence cooling down the plant at approximately 75°F/hr to 420°F (Tcold).

#### **Change 6**

Section: Maintain Core Cooling & Heat Removal, PWR Installed Equipment Phase 1.

Reason for Change: Editorial change to correct a reference

Change: Change reference # three (3) to OU-AP-104, Shutdown Safety Management Program Byron /Braidwood Annex, Revision 17, dated September 27, 2012.

#### **Change 7**

Section: Maintain Core Cooling & Heat Removal, Phase 1, Identify Modifications.

Reason for Change: The gaps identified, preventing operation of the DDAF pump, will be resolved with a combination of modifications and manual actions instead of just modifications.

Change: The following gaps have been identified that prevent operation of the DDAF pump: Braidwood Station will utilize modifications and/or manual actions to close these gaps prior to FLEX implementation.

### **Change 8**

Section: Maintain RCS Inventory Control, PWR Installed Equipment Phase 1.

Reason for Change: The timeline expectation is for operators to start a cool down within 90 minutes of the event initiation, not to complete the cool down within 90 minutes as stated. This change is to align the wording in this section to be consistent with the expectations.

Change: Within 90 minutes, operators will commence cooling down the plant at approximately 75°F/hr to 420°F (Tcold).

### **Change 9**

Section: Attachment 1A, Sequence of Events time line, Action Item Number 3.

Reason for Change: Modification design details were refined as parts of the standardized modification design process and manual actions have been added and verified to accomplish these tasks.

Change: The time from step initiation to completion is now 5 to 50 minutes.

### **Change 10**

Section: Attachment 1A, Sequence of Events time line, Action Item Number 7.

Reason for Change: Editorial Change.

Change: Connect FLEX 480V AC generators to ESF bus \_32X and verify they are supplying power to Div 2 - 125V DC battery chargers.

### **Change 11**

Section: Attachment 1A, Sequence of Events time line, Action Item Number 8.

Reason for Change: Add the word 'approximately' to align the strategy to actual plant conditions and for consistency throughout the integrated plan.

Change: Start depressurization of S/Gs to 300 psia at approximately 75°F/hr cooldown with SG PORV local/manual operation. SG feed is controlled with Local/Manual operation of AFW flow control valves.

**Change 12**

Section: Attachment 3, Conceptual Sketches

Reason for Change: Modification design details were refined as part of the standardized modification design process resulting in changes to the mechanical and electrical power conceptual sketches.

Change: Current mechanical conceptual sketch is attached to this document.

No other changes to the FLEX strategies have been identified at this time.

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

Braidwood Station, Units 1 and 2 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 Draft Safety Evaluation**

The following tables provide a summary of the open items documented in the Overall Integrated Plan or the Draft Safety Evaluation (SE) and the status of each item.

<b>Section Reference</b>	<b>Overall Integrated Plan Open Item</b>	<b>Status</b>
Key Site assumptions (p.4)	Primary and secondary storage locations have not been selected yet; once locations are finalized implementation strategies and routes will be assessed for hazard impact.	Started
Sequence of events (p.5)	The final timeline will be time validated once detailed designs are completed and procedures are developed.	Not Started
Identify how strategies will be deployed (p.7)	Identification of storage area and creation of the administrative program.	Started
Programmatic controls (p.8)	Develop an administrative program for FLEX responsibilities, and testing & maintenance.	Started
Regional Response Center plan (p.9)	Development of Braidwood Station's playbook.	Not Started
Key Reactor Parameters (p. multiple)	Identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage.	Not Started
Deployment Conceptual Design (p. multiple)	Develop the storage structure conceptual design.	Started

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Maintain RCS Inventory Control, Phase 2 (p.23)	A calculation will be required for the timing of the boration and quantity required.	Started
Maintain Containment, Phase 1 (p.31)	Additional calculations will be performed to evaluate containment response.	Not Started
Maintain Spent Fuel Pool Cooling, Phase 1 (p.39)	Procedure development for Initial Spent fuel pool make-up with gravity drain from the RWST.	Not Started
Maintain Spent Fuel Pool Cooling, Phase 1 (p.39)	Initial calculations were used to determine the fuel pool timelines. Formal calculations will be performed to validate this information during development of the spent fuel pool cooling strategy detailed design.	Not Started
Maintain Spent Fuel Pool Cooling, Phase 1, (p.39 and p.42)	Evaluation of the spent fuel pool area for steam and condensation will be performed and used to determine if vent path strategy is needed.	Not Started
Safety Functions Support, Phase 2 (p.51)	Habitability conditions will be evaluated and a strategy will be developed to maintain Main Control Room.	Not Started
Safety Functions Support, Phase 2 (p.51)	Critical ventilation assets may be required to support DDAF pumps, station battery rooms, miscellaneous electric equipment rooms, and fuel handling building personnel habitability and/or component survivability. Specific analyses of these rooms will be performed.	Not Started

Draft Safety Evaluation Open Item	Status
N/A	N/A

**7 Potential Draft Safety Evaluation Impacts**

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

**8 References**

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

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1. Braidwood Station, Units 1 and 2, "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 (RS-13-017).
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 Rev. 0, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, dated August 2012.

