Exelon Generation®

Order No. EA-12-049

RS-14-014

February 28, 2014

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: 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)

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-13-024)
6. Exelon Generation Company, LLC 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), dated August 28, 2013 (RS-13-127)
7. NRC letter to Exelon Generation Company, LLC, Peach Bottom Atomic Power Station, Units 2 and 3 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0845 and MF0846), dated November 22, 2013

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 Peach Bottom Atomic Power Station, Units 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 provides the first six-month status report pursuant to Section IV, Condition C.2, of Reference 1 for Peach Bottom Atomic Power Station. 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 the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any. The enclosed report also addresses the NRC Interim Staff Evaluation Open and Confirmatory Items contained in Reference 7.

As described in Reference 5, full implementation of NRC Order EA-12-049 required mitigation strategies is dependent upon implementation of reliable hardened containment venting capability established in accordance with NRC Order EA-12-050. NRC Order EA-13-109 issued by the NRC on June 6, 2013, rescinded the requirements of Order EA-12-050 and established revised schedule timelines and implementation dates for reliable hardened containment vents capable of operation under severe accident conditions. The revised schedule and implementation timeline contained in Order EA-13-109 delays the ability to achieve full implementation of the mitigation strategy requirements of Order EA-12-049. This need for relaxation from the implementation requirements of Order EA-12-049 is described in Section 5 of the enclosed update report. The request for relaxation of the full implementation schedule requirements of Order EA-12-049 is being submitted separately.

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 28th day of February 2014.

Respectfully submitted,

D. P. Helker

David P. Helker
Manager - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure:

1. Peach Bottom Atomic Power Station, Units 2 and 3 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: Director, Office of Nuclear Reactor Regulation
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NRC Senior Resident Inspector – Peach Bottom Atomic Power Station, Units 2 and 3
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Enclosure

Peach Bottom Atomic Power Station, Units 2 and 3

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

(16 pages)

Enclosure

Peach Bottom Atomic Power Station Units 2 and 3 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

Peach Bottom Atomic Power Station, Units 2 and 3 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.

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	
Contract with RRC		Complete	
Submit 6 Month Updates:			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete with this submittal	
Update 3	Aug 2014	Not Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Update 4	Feb 2015	Not Started	
Update 5	Aug 2015	Not Started	
Update 6	Feb 2016	Not Started	
Update 7	Aug 2016	Not Started	
Submit Completion Report	Dec 2016	Not Started	
Perform Staffing Analysis	May 2015	Not started	
Modifications:			
Unit 2 Design Engineering	May 2015	Started	
Unit 2 Implementation Outage	Nov 2016	Not Started	
Unit 3 Design Engineering	June 2014	Started	
Unit 3 Implementation Outage	Oct 2015	Not Started	
Storage:			
Storage Design Engineering	Oct 2015	Not Started	
Storage Implementation	Oct 2015	Not started	
FLEX Equipment:			
Procure On-Site Equipment	Sept 2015	Started	
Develop Strategies with RRC	Dec 2014	Started	
Procedures:			
Create Site-Specific Procedures	Sept 2015	Not started	
Validate Procedures (NEI-12.06, section 11.4.3)	Sept 2015	Not started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Create Maintenance Procedures	Sept 2015	Not started	
Training:			
Develop Training Plan	March 2015	Not started	
Training Complete	Oct 2015	Not started	
Unit 2 FLEX Implementation	Oct 2016	Not started	
Unit 3 FLEX Implementation	Oct 2015	Not started	
Full Site FLEX Implementation	Oct 2016	Not started	

4 Changes to Compliance Method

No changes from the previous First Six month Update submittal.

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

Relief /Relaxation is required due to the delay in the modifications to the Torus Hardened Vent due to the Severe Accident Capable Vent (SACV) Order EA-13-109 (Reference 3).

This section provides a summary of needed relief/relaxation only. The specific details are being submitted in a separate document.

NRC Order EA-12-049 requires implementation of Mitigation Strategies to include procedures, guidance, training, and acquisition, staging, or installing of equipment needed for the strategies. Reference 1 provided the Peach Bottom Atomic Power Station response to NRC Order EA-12-049. The cover letter identifies that delays in implementing the Hardened Containment Vent System as required by NRC Order EA-13-109 (Reference 3) will also affect implementation of the Mitigation Strategies Order EA-12-049 actions.

The Reference 1 enclosure describes the Peach Bottom Atomic Power Station Mitigation Strategies that is based on venting the containment using the Hardened Containment Vent System. It also describes that a modification to install a Hardened Containment Vent System (HCVS) is required.

Thus, the Peach Bottom Atomic Power Station NRC Order EA-12-049 response provided in Reference 1 was premised on installation and use of a Hardened Containment Vent System as

required by NRC Order EA-12-050. Upon issuance of NRC Order EA-13-109, the NRC staff changed technical and schedule requirements applicable to the Hardened Containment Vent System and rescinded the requirements of NRC Order EA-12-050.

As a result, full compliance to the Mitigation Strategies required by NRC Order EA-12-049 and described in Reference 1 for Peach Bottom Atomic Power Station Unit 3 will not be achieved until compliance to NRC Order EA-13-109 is achieved. Relief/relaxation from the NRC Order EA-12-049, Section IV.A.2 requirements is required.

Peach Bottom Atomic Power Station Unit 3 will be in compliance with the aspects of the Reference 1, Unit 3 Mitigation Strategies that do not rely upon a Hardened Containment Vent System unless otherwise described.

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.

Section Reference	Overall Integrated Plan Open Item	Status
Multiple Sections	Item 1) Transportation routes will be developed from the equipment storage area to the FLEX staging areas. An administrative program will be developed to ensure pathways remain clear or compensatory actions will be implemented to ensure all strategies can be deployed during all modes of operation. The location of the storage areas, identification of the travel paths and creation of the administrative program are open items.	Started
Programmatic Controls (p. 7)	Item 2) An administrative program for FLEX to establish responsibilities, testing and maintenance requirements will be implemented.	Not started
Describe Training Plan (p. 8)	Item 3) Training materials for FLEX will be developed for all station staff involved in implementing FLEX strategies.	Not started

Maintain Spent Fuel pool Cooling (p. 30)	Item 4) Complete an evaluation of the spent fuel pool area for steam and condensation to determine vent path strategy requirements.	Started
Safety Function Support (p. 38)	Item 5) RCIC room temperature analysis is still in progress.	Started
Safety Function Support (p.38)	Item 6) Evaluate the habitability of the Main Control Room and develop a strategy to maintain habitability.	Not started
Safety Function Support (p. 38)	Item 7) Develop a procedure to prop open battery room doors and utilize portable fans or utilize installed room supply and exhaust fans upon energizing the battery chargers to prevent a buildup of hydrogen in the battery rooms.	Not started
Sequence of Events (p. 4)	Item 8) Timeline walk through will be completed for the FLEX generator installations when the detailed design and site strategy is finalized. The final timeline will be validated once the detailed designs are developed. The results will be provided in a future 6 month update.	Not started
Sequence of Events (p.4)	Item 9) Timeline walk through will be completed for the FLEX pump installations when the detailed design and site strategy is finalized. The final timeline will be validated once the detailed designs are developed. The results will be provided in a future 6 month update.	Not started
Sequence of Events (p. 5)	Item 10) Additional analysis will be performed during detailed design development to ensure Suppression Pool temperature will support RCIC operation, in accordance with approved	Not started

	BWROG analysis, throughout the event.	
Sequence of Events (p. 5)	Item 11) Analysis of deviations between Exelon's engineering analyses and the analyses contained in BWROG Document NEDC-33771P, "GEH Evaluation of FLEX Implementation Guidelines," and documentation of results on Att. 1B, "NSSS Significant Reference Analysis Deviation Table." Planned to be completed and submitted with August 2013 Six Month Update.	Completed.

Draft Safety Evaluation Open Item	Status
See Attachments 1 and 2	See Attachments 1 and 2

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.

1. Peach Bottom Atomic Power Station Units 2 and 3, 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. NRC Order Number EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013.
4. NRC Order Number EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents," dated March 12, 2012

9 Attachments

1. Attachment 1 Interim Safety Evaluation 4.1 Open Items
2. Attachment 2 Interim Safety Evaluation 4.2 Confirmatory Items
3. Attachment 3 Confirmatory Item 3.1.1.1.A Response

Attachment 1

4.1 Open Items	
3.2.3.A Revision 3 to the BWROG EPG SAG is a Generic Concern because the BWROG has not addressed the potential for the revised venting strategy to increase the likelihood of detrimental effects on containment response for events in which the venting strategy is invoked.	Started
3.2.4.3.A Freeze protection has not been discussed in the Integrated Plan or during the audit process.	Not started
3.2.4.4.A Portable and emergency lighting during an ELAP has not been discussed in the integrated plan or during the audit process.	Not started
3.2.4.5.A Access to protected and internal locked plant areas during an ELAP has not been discussed in the Integrated Plan or during the audit process.	Started. The existing Peach Bottom procedure SE-11 "Loss of Offsite Power" issues Master Security Keys to Operations personnel for actions requiring access inside the Protected Area.

Attachment 2

4.2 Confirmatory Items	
3.1.1.1.A The method selected for protection of equipment during a BDBEE was not discussed in the Integrated Plan or during the audit process. There was no discussion of the specifications stated in NEI 12-06, Sections 5.3.1, 6.2.3.1, 7.3.1, 8.3.1, and 9.3.1. Also, there was no discussion of securing large portable equipment for protection during a seismic hazard.	See Attachment 3
3.1.1.2.A Deployment routes have not yet been finalized or reviewed for possible impacts due to debris and potential soil liquefaction	Started
3.1.1.2.C Protection of vehicles used to deploy and re-fuel portable/FLEX equipment during a BDBEE was not discussed in the Integrated Plan or during the audit process.	Started. The vehicles used to deploy and refuel the FLEX equipment will be stored in the robust FLEX building.
3.1.1.3.A Seismic procedural interface consideration NEI 12-06, section 5.3.3, consideration 1, which considers the possible failure of seismically qualified electrical equipment by beyond-design basis seismic events, was not discussed in the Integrated Plan or during the audit process.	Not started
3.1.1.3.B Seismic procedural interface considerations NEI 12-06, section 5.3.3, 2 and 3, which considers flooding from large internal sources and also mitigation of ground water, was not discussed in the Integrated Plan or during the audit process.	Not started
3.1.1.4.A Utilization of offsite resources - the local staging area was not discussed in the Integrated Plan or during the audit process.	Not started
3.1.2.A Characterization of the external flooding hazard in terms of warning time and persistence was not discussed in the Integrated Plan or during the audit process.	Started. The Flood Hazard reanalysis is in progress.
3.1.2.1A Protection of portable/FLEX equipment during a flooding BDBEE was not discussed in the Integrated Plan or during the audit process.	Started
3.1.2.2.A Movement of equipment and restocking of supplies in the context of a flood with long persistence during a BDBEE was not discussed in the Integrated Plan or during the audit process.	Not started
3.1.3.2.A Availability of debris clearing equipment during a BDBEE was not discussed in the Integrated Plan or during the audit process.	Started. The vehicle and equipment used to clear debris will be stored in the FLEX building
3.1.4.2.A Snow or ice removal during a BDBEE was not discussed in the Integrated Plan or during the audit process. Additionally, there was no discussion of ice blocking the FLEX pump suctions.	Not started

3.2.1.1.A MAAP benchmarks should be identified and discussed which demonstrate that MAAP4 is an appropriate code for the simulation of an ELAP event.	Started
3.2.1.1.B MAAP Analysis - collapsed level should remain above Top of Active Fuel (TAF) and the cool down rate should be within technical specification limits.	Started
3.2.1.1.C MAAP4 should be used in accordance with Sections 4.1, 4.2, 4.3, 4.4, and 4.5 of the June 2013 position paper.	Started
3.2.1.1.D MAAP modeling parameters. In using MAAP4, the licensee should identify and justify the subset of key modeling parameters cited from Tables 4-1 through 4-6 of the "MAAP4 Application Guidance, Desktop Reference for Using MAAP4 Software, Revision 2" (Electric Power Research Institute Report 1020236).	Started
3.2.1.1.E The specific MAAP4 analysis case that was used to validate the timing of mitigating strategies in the Integrated Plan should be identified and available for review.	Started
3.2.1.2.A There was no discussion of the assumed recirculation system leakage rates including the recirculation pump seal leakage rates that were used in the ELAP analysis. Questions still remain unanswered regarding pressure dependence of the assumed leakage rates, assumed leakage phase, i.e. single phase liquid, two phase, or steam, and other questions presented in the audit.	Not started
3.2.1.4.A Required flow rates and portable/FLEX pump characteristics were not discussed in the Integrated Plan or during the audit process. Likewise, there was no discussion of the required flow for mitigation strategies and no discussion of the calculations that verify adequate flow.	Started
3.2.1.4.B There was no discussion of the assumptions used in the calculations for battery coping time and to evaluate the effectiveness of dc load reduction including the basis for the assumed minimum battery voltage.	Not started
3.2.1.4.C The operability of the RCIC pump at elevated suction temperature was not discussed in the Integrated Plan or during the audit process.	Started
3.2.1.4.D Water quality issues and guidance on priority of water source usage were not fully addressed in the Integrated Plan or during the audit process and requires further analysis by licensee.	Started
3.2.2.A Evaluation of the refueling floor SFP area for steam and condensation was not yet completed. Mitigating strategies for a vent pathway were not discussed in the Integrated Plan or during the	Started

audit process.	
3.2.4.2.A The impact of high temperature on the operability of RCIC Room electrical and mechanical equipment, including the RCIC turbine speed controller, was not discussed in the Integrated Plan or during the audit process.	Started
3.2.4.2.B Evaluation of high and low battery temperatures is to be provided during a future six-month-update.	Not started
3.2.4.4.B Plant communications during an ELAP were not discussed in the Integrated Plan or the audit process. Follow-up of commitments made in the communications assessment (ADAMS Accession No. ML 12306A199) is necessary.	Started. Three satellite phones are available for offsite communications. The plant radio "Talk Around" is adequate for line of site communications and extra batteries and chargers are available. Evaluation of existing communications systems is in progress.
3.2.4.6.A Initial analysis for accessibility and habitability of critical plant locations as the RCIC Room showed relatively high temperatures. There was no discussion of the effectiveness of ventilation with portable fans. There was no discussion of long term habitability in critical plant locations during an ELAP.	Not started
3.2.4.7.A Emergency Cooling Tower water volume and replenishment was not discussed in the Integrated Plan or during the audit process.	Started.
3.2.4.8.A The licensee did not provide sufficient information regarding loading/sizing calculations of portable diesel generator(s) and strategy for electrical isolation for FLEX electrical generators from installed plant equipment.	Started Estimated Load for Unit 2 is 231.9 kw, 281.3 kva. Estimated Load for Unit 3 is 130kw, 164.0 kva. FLEX Generators are 480 vac 500 kva. Isolation from installed plant equipment will be by racked out circuit breakers or locked open disconnect switches.
3.2.4.9.A Details of portable equipment fuel storage transfer were provided during the audit process. However, the method to ensure fuel quality was not discussed in the Integrated Plan or during the audit process.	Started
3.4.A The program or process to request RRC equipment was not discussed in the Integrated Plan or during the audit process.	Not started

3.4.B Sizing calculations of RRC FLEX equipment and the compatibility of RRC equipment to plant connection points were not discussed in the Integrated Plan or during the audit process.	Not started

5.3.1 Protection of FLEX Equipment (Seismic)	
1. FLEX equipment should be stored in one or more of following three configurations:	
a. In a structure that meets the plant's design basis for the Safe Shutdown Earthquake (SSE)(e.g., existing safety-related structure).	FLEX pumps, generators and other equipment will be stored in a structure designed to survive a SSE.
b. In a structure designed to or evaluated equivalent to ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.	NA
c. Outside a structure and evaluated for seismic interactions to ensure equipment is not damaged by non-seismically robust components or structures.	NA
2. Large portable FLEX equipment such as pumps and power supplies should be secured as appropriate to protect them during a seismic event (i.e., Safe Shutdown Earthquake (SSE) level).	FLEX pumps, generators and other large equipment will be secured to prevent damage during a SSE.
3. Stored equipment and structures should be evaluated and protected from seismic interactions to ensure that unsecured and/or non-seismic components do not damage the equipment.	The robust FLEX storage structure will be designed to protect the FLEX equipment from unsecured or non-seismic components during a SSE.
6.2.3.1 Protection of FLEX Equipment (Flooding)	
These considerations apply to the protection of FLEX equipment from external flood hazards:	
1. The equipment should be stored in one or more of the following configurations:	
a. Stored above the flood elevation from the most recent site flood analysis. The evaluation to determine the elevation for storage should be informed by flood analysis applicable to the site from early site permits, combined license applications, and/or contiguous licensed sites.	NA
b. Stored in a structure designed to protect the equipment from the flood.	NA
c. FLEX equipment can be stored below flood level if time is available and plant procedures/guidance address the needed actions to relocate the equipment. Based on the timing of the limiting flood scenario(s), the FLEX equipment can be relocated to a position that is protected from the flood, either by barriers or by elevation, prior to the arrival of the potentially damaging flood levels. This should also consider the conditions on-site during the	FLEX pumps, generators and other equipment will be stored below the PMF elevation. Procedures governing actual or predicted high river level or flows will include

increasing flood levels and whether movement of the FLEX equipment will be possible before potential inundation occurs, not just the ultimate flood height.	guidance for relocating the equipment to an elevation above the PMF level and prior to a river level that would prevent transport.
2. Storage areas that are potentially impacted by a rapid rise of water should be avoided.	Events causing a river level exceeding 116' elevation that would prevent transport of FLEX equipment would potentially have several days warning; however, the flood hazard reanalysis is in progress and additional information will be provided in a future 6 month update.
7.3.1 Protection of FLEX Equipment (Wind)	
These considerations apply to the protection of FLEX equipment from high wind hazards:	
1. For plants exposed to high wind hazards, FLEX equipment should be stored in one of the following configurations:	
a. In a structure that meets the plant's design basis for high wind hazards (e.g., existing safety-related structure).	FLEX pumps, generators and other equipment will be stored in a structure that will survive the design basis wind.
b. In storage locations designed to or evaluated equivalent to ASCE 7-10, Minimum Design Loads for Buildings and Other Structures given the limiting tornado wind speeds from Regulatory Guide 1.76 or design basis hurricane wind speeds for the site. Given the FLEX basis limiting tornado or hurricane wind speeds, building loads would be computed in accordance with requirements of ASCE 7-10. Acceptance criteria would be based on building serviceability requirements not strict compliance with stress or capacity limits. This would allow for some minor plastic deformation, yet assure that the building would remain functional.	NA
• Tornado missiles and hurricane missiles will be accounted for in that the FLEX equipment will be stored in diverse locations to provide reasonable assurance that N sets of FLEX equipment will remain	NA

deployable following the high wind event. This will consider locations adjacent to existing robust structures or in lower sections of buildings that minimizes the probability that missiles will damage all mitigation equipment required from a single event by protection from adjacent buildings and limiting pathways for missiles to damage equipment.	
• The axis of separation should consider the predominant path of tornados in the geographical location. In general, tornadoes travel from the West or West Southwesterly direction, diverse locations should be aligned in the North-South arrangement, where possible. Additionally, in selecting diverse FLEX storage locations, consideration should be given to the location of the diesel generators and switchyard such that the path of a single tornado would not impact all locations.	NA
• Stored mitigation equipment exposed to the wind should be adequately tied down. Loose equipment should be in protective boxes that are adequately tied down to foundations or slabs to prevent protected equipment from being damaged or becoming airborne. (During a tornado, high winds may blow away metal siding and metal deck roof, subjecting the equipment to high wind forces.)	NA
c. In evaluated storage locations separated by a sufficient distance that minimizes the probability that a single event would damage all FLEX mitigation equipment such that at least N sets of FLEX equipment would remain deployable following the high wind event. (This option is not applicable for hurricane conditions).	NA
• Consistent with configuration b., the axis of separation should consider the predominant path of tornados in the geographical location.	NA
• Consistent with configuration b., stored mitigation equipment should be adequately tied down.	NA
8.3.1 Protection of FLEX Equipment (Snow, Ice, Cold)	
These considerations apply to the protection of FLEX equipment from snow, ice, and extreme cold hazards:	
1. For sites subject to significant snowfall and ice storms, portable FLEX equipment should be stored in one of two configurations:	
a. In a structure that meets the plant's design basis for the snow, ice and cold conditions (e.g., existing safety-related structure).	FLEX pumps, generators and other equipment will be stored in a structure that will

	survive the design basis for snow, ice, and cold.
b. In a structure designed to or evaluated equivalent to ASCE 7-10, Minimum Design Loads for Buildings and Other Structures for the snow, ice, and cold conditions from the site's design basis.	NA
c. Provided the N FLEX equipment is located as described in a. or b. above, the N+1 equipment may be stored in an evaluated storage location capable of withstanding historical extreme weather conditions and the equipment is deployable.	NA
2. Storage of FLEX equipment should account for the fact that the equipment will need to function in a timely manner. The equipment should be maintained at a temperature within a range to ensure its likely function when called upon. For example, by storage in a heated enclosure or by direct heating (e.g., jacket water, battery, engine block heater, etc.).	FLEX pumps, generators and their storage location will include appropriate heating.
9.3.1 Protection of FLEX Equipment (High Temperature)	
The equipment should be maintained at a temperature within a range to ensure its likely function when called upon.	FLEX pumps, generators and their storage location will include appropriate ventilation such that the equipment will be maintained within operating limits.