



Order No. EA-12-049

RS-15-212

August 28, 2015

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

Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: 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)

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-13-022)
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-13-123)
7. Exelon Generation Company, LLC 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), dated February 28, 2014 (RS-14-012)

8. Exelon Generation Company, LLC 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), dated August 28, 2014 (RS-14-210)
9. Exelon Generation Company, LLC 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), dated February 27, 2015 (RS-15-021)
10. NRC letter to Exelon Generation Company, LLC, Limerick Generating Station, Units 1 and 2 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0847 and MF0848), dated January 10, 2014
11. NRC letter to Exelon Generation Company, LLC, Limerick Generating Station, Units 1 and 2 – Report for the Audit Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051 (TAC Nos. MF0847, MF0848, MF0854, and MF0855), dated March 17, 2015

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.

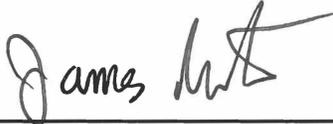
Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the EGC initial status report regarding mitigation strategies. Reference 5 provided the Limerick Generating 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. References 6, 7, 8, and 9 provided the first, second, third, and fourth six-month status reports, respectively, pursuant to Section IV, Condition C.2, of Reference 1 for Limerick Generating Station. 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 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 10, and any NRC Audit Report open items contained in Reference 11.

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 August 2015.

Respectfully submitted,



James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure:

1. Limerick Generating Station, Units 1 and 2 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

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator - Region I
NRC Senior Resident Inspector – Limerick Generating Station, Units 1 and 2
NRC Project Manager, NRR – Limerick Generating Station, Units 1 and 2
Ms. Jessica A. Kratchman, NRR/JLD/PMB, NRC
Mr. Jack R. Davis, NRR/DPR/MSD, NRC
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Mr. Jeremy S. Bowen, NRR/DPR/MSD/MSPB, NRC
Mr. Robert L. Dennig, NRR/DSS/SCVB, NRC
Mr. John D. Hughey, NRR/JLD/JOMB, NRC
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental Resources
R. R. Janati, Chief, Division of Nuclear Safety, Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection

Enclosure

Limerick Generating Station, Units 1 and 2

**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**

(18 pages)

Limerick Generating Station, Units 1 and 2
Fifth Six Month Status Report for the Implementation of FLEX
August 28, 2015

Enclosure

Limerick Generating Station, Units 1 and 2 Fifth Six Month Status Report for the Implementation of Order EA-12-049, Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

1 Introduction

Limerick Generating Station, Units 1 and 2 developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to NRC Order EA-12-049 (Reference 2). This enclosure provides an update of milestone accomplishments since submittal of the last status report, 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 February 27, 2015 status report (Reference 11) and are current as of July 31, 2015.

- All Unit 2 system modifications are complete.
- All Unit 2 and Plus One (+1) FLEX equipment is on site.
- All Unit 2 FLEX procedures have been issued.
- All FLEX training is complete.

3 Milestone Schedule Status

The following provides an update to Attachment 2 of the Overall Integrated Plan (Reference 1). 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 need for relief/relaxation on site implementation of Order EA-12-049 is provided in Section 5 of this enclosure.

Milestone Schedule

Site: Limerick Generating Station

Activity	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	October 2012	Complete	
Submit Overall Integrated Plan	February 2013	Complete	
Contract with RRC	October 2012	Complete	

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Activity	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 6 Month Updates:			
Update 1	August 2013	Complete	
Update 2	February 2014	Complete	
Update 3	August 2014	Complete	
Update 4	February 2015	Complete	
Update 5	August 2015	Complete with this submittal	
Update 6	February 2016	Not Started	
Update 7	August 2016	Not Started	
Submit Completion Report	April 2016	Not Started	April 2018 See Section 5
Modification Development & Implementation:			
Unit 1 Modification Development (All FLEX Phases)	June 2015	Started	September 2015
Unit 1 Modification Implementation (All FLEX Phases)	April 2016	Started	
Unit 2 Modification Development (All FLEX Phases)	November 2014	Complete	
Unit 2 Modification Implementation (All FLEX Phases)	April 2015	Complete	
Procedures:			
Create Site-Specific Procedures	April 2015	Complete	
Validate Procedures (NEI 12-06, Sect. 11.4.3)	March 2015	Complete	
Create Maintenance Procedures	April 2015	Complete	
Perform Staffing Analysis	November 2014	Complete	
Storage Plan and Construction	April 2015	Started	October 2015 See Section 5
FLEX Equipment Acquisition	April 2015	Complete	
Training Completion	April 2015	Complete	

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Activity	Target Completion Date	Activity Status	Revised Target Completion Date
Regional Response Center Operational	December 2014	Complete	
Unit 1 FLEX Implementation	April 2016	Started	April 2018 See Section 5
Unit 2 FLEX Implementation	April 2015	Started	April 2017 See Section 5
Full Site FLEX Implementation	April 2016	Started	April 2018 See Section 5

4 Changes to Compliance Method

Limerick Generating Station will be adopting the NRC endorsed (ML15125A442) NEI position paper (ML15126A135) "Alternate Approach Hoses and Cable". Method 1 was selected as the preferred alternative for both spare hose and cables.

NRC Audit open item for +1 storage requirements – Exelon proposes an alternate approach to NEI 12-06 Revision 0 for protection of FLEX equipment as stated in Section 11.5.3. Limerick Generating station has decided to eliminate the construction of the +1 commercial storage building. An evaluation was performed to determine that sufficient space exists in the Owner Controlled Area (OCA) robust building to house all the +1 equipment, thus protecting it from all hazards. The +1 pump will be deployable from the OCA building. The +1 generator while stored in a robust building may not be deployable under all scenarios from this location. Exelon will develop procedures to address the unavailability allowance as stated in NEI 12-06 Revision 0 Section 11.5.3., (Maintenance and Testing). This section allows for a 90-day period of unavailability provided N sets of equipment remain available. If a piece of FLEX equipment stored in the robust building were to become or found to be unavailable, Exelon will impose a shorter allowed outage time of 45 days. For portable equipment that is expected to be unavailable for more than 45 days, actions will be initiated within 24 hours of this determination to restore the site FLEX capability (N) in the robust storage location and implement compensatory measures (e.g., move the +1 piece of equipment into the robust building) within 72 hours where the total unavailability time is not to exceed 45 days.

For example, if one of the N generators becomes unavailable, Limerick will enter the time clock to restore N capability in a protected and deployable location. Limerick will take action to move the +1 generator into the Protected Area (PA) robust building where it is protected and deployable, thereby restoring N capability within the allowed time period.

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

This section provides a summary of needed relief/relaxation only.

Limerick Generating Station will be in compliance with the aspects of the Reference 1, Unit 1 and Unit 2 Mitigation Strategies that do not rely upon a Hardened Containment Vent System unless otherwise described. Limerick Generating Station submitted the request for relaxation to the NRC by letter dated

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February 26, 2014 (Reference 8). The NRC approved the Limerick relaxation request for full compliance of NRC Order EA-12-049 by letter dated April 15, 2014 (Reference 9).

Limerick Generating Station, Unit 2 submitted a request for schedule relaxation from NRC Order EA-12-049, related to robust building completion dated April 2, 2015 (Reference 13). The NRC approved the Limerick schedule relaxation request by letter dated April 29, 2015 (Reference 14).

Limerick Generating Station, Unit 2 submitted a second request for schedule relaxation related to robust building completion to the NRC by letter dated July 9, 2015 (Reference 15). The NRC approved the second Limerick schedule relaxation request by letter dated July 20, 2015 (Reference 16).

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
Sequence of Events (p. 8)	The times to complete actions in the Events Timeline are based on operating judgment, conceptual designs, and current supporting analyses. The final timeline will be time validated once detailed designs are completed and procedures developed.	Complete with this submittal. All time line validations have been completed using final design connection locations and station procedures. The review concluded that all strategies can be completed in the required time frames.
Sequence of Events (p. 7) Installed Phase 1 Equipment (p.37)	Initial evaluations 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.	Complete (Reference 10)
Sequence of Events (p. 7)	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 was not completed and submitted with the Overall Integrated Plan (Reference 1).	Complete (Reference 4)

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<p>Identify how strategies will be deployed in all modes (p. 11)</p>	<p>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.</p> <p>Identification of storage areas and creation of the administrative program are open items.</p>	<p>Complete with this submittal. Storage Building locations for equipment have been identified and travel routes to point of use evaluated in Technical Evaluation 1550669-08 (posted on ePortal). The site yard storage approval procedure MA-LG-716-026-1001 was also revised to require Operations review and approval of yard laydown requests.</p>
<p>Identify how the programmatic controls will be met (p. 12)</p>	<p>An administrative program for FLEX to establish responsibilities, and testing & maintenance requirements will be implemented.</p>	<p>Complete with this submittal. The Limerick site specific program (CC-LG-118) has been completed and issued.</p>
<p>Sequence of Events (p. 9)</p>	<p>Additional work will be performed during detailed design development to ensure Suppression Pool temperature will support RCIC operation, in accordance with approved BWROG analysis, throughout the event.</p>	<p>Complete with this submittal. A review of the BWROG RCIC paper has been completed to confirm that elevated suppression pool temperatures will support RCIC operation during a Beyond Design Basis External Event (BDBEE). A review of pipe stresses at elevated temperatures is documented in Technical Evaluation 1550669-11 (posted on ePortal).</p>
<p>Portable Equip Phase 2 (p. 50)</p>	<p>Complete an evaluation of the spent fuel pool area for steam and condensation.</p>	<p>Complete (Reference 11)</p>

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<p>Installed Equip Phase 1 (p.47)</p> <p>Portable Equip Phase 2 (p. 49)</p>	<p>Evaluate the habitability conditions for the Main Control Room and develop a strategy to maintain habitability.</p>	<p>Complete with this submittal. Habitability conditions within the Main Control Room (MCR) and other areas of the plant will be maintained with a tool box approach limiting the impact of high temperatures with methods such as supplemental cooling, personnel rotation and/or availability of fluids. Technical Evaluation 1550669-04 (posted on ePortal) concludes that actions to ventilate the main control room will not be required until after at least 24 hours post event. Guidance for establishing ventilation has been included in site procedure T-362 that has been issued.</p>
<p>Installed Equip Phase 1 (p.47)</p> <p>Portable Equip Phase 2 (p. 50)</p>	<p>Develop a procedure to prop open battery room doors upon energizing the battery chargers to prevent a buildup of hydrogen in the battery rooms.</p>	<p>Complete with this submittal. Technical Evaluation 1550669-05 (posted on ePortal) documents that ventilation is not required until 24 hours after the event. Guidance for establishing ventilation has been included in site procedure T-361 that has been issued.</p>

Item Number	Interim Staff Evaluation (ISE) Open Items / Confirmatory Actions	Status
Open Item 3.1.1.2.A	NEI 12-06 states that if power is required to move or deploy the equipment (e.g., to open the door from a storage location), then power supplies should be provided as part of the deployment. The Integrated Plan did not address whether or not power would be required to move or deploy equipment and thus this evaluation must be completed	Complete (Reference 10)

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	satisfactorily.	
Open Item 3.1.1.3.A	The licensee did not address actions to be taken if key instruments were lost due to a seismic event, as specified in NEI 12-06, section 5.3.3. Verify that this activity is completed satisfactorily.	Complete with this submittal. Procedure T-370 has been issued.
Open Item 3.1.2.2.A NRC Audit Open Item	Further review is required regarding how the licensee will address NEI 12-06 Section 6.2.3.2 deployment considerations 2, 4, 5, and 8 with respect to transient floods. This review shall include an applicable procedure review.	Complete (Reference 7); NRC Audit reopened, due to a concern related to deployability from the +1 building. Complete with this submittal. LGS has eliminated the +1 building. All pumps will be stored in the OCA robust building and be deployable. The +1 generator will be stored robustly in the OCA building, but will require relocation to the FLEX generator robust building to be considered deployable (see alternate compliance approach in Section 4).
Open Item 3.2.3.A	With regard to maintaining containment, the implementation of Boiling Water Reactor Owners Group (BWROG) Emergency Procedure Guideline (EPG)/Severe Accident Guideline (SAG), Revision 3, including any associated plant-specific evaluations, must be completed in accordance with the provisions of NRC letter dated January 9, 2014.	Complete with this submittal. The following information was provided during the NRC audit to close this item: Limerick will implement revisions to the site Emergency Operating Procedures (EOPs) based on BWROG EPG/SAG Revision 3 that support the FLEX strategy [AT 2402801-01]. The revisions will be completed in compliance with the normal change processes for plant Emergency Operating Procedures (OP-LG-101-100, "Transient Response

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		<p>Implementation Plan (TRIP) and Severe Accident Management Plan (SAMP) Procedures Program”) - including evaluations that support the use of the revised strategy. The EOP revisions will include necessary “limited depressurization” of the reactor vessel to preserve steam-driven injection systems (RCIC or HPCI) required to maintain adequate core cooling and “anticipatory venting” of primary containment for decay heat removal. The “anticipatory venting” strategy will use existing containment vent paths due to the approved deferral of compliance with the containment vent portion of the EA-12-049 Order.</p> <p>Inclusion of “any associated plant-specific evaluations must be completed in accordance with the provisions of NRC letter dated January 9, 2014 [Reference 5].” Based on Limerick’s approved deferral of compliance with the vent portion of the EA-12-049 order (ML14065A528), formal “plant-specific evaluations” will not be performed for the existing vent paths that will be used for “anticipatory venting” for other than informational purposes.</p> <p>Regarding the Audit item OI 3.2.3.A referral to “provisions” in the January</p>
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		<p>10, 2014 letter, they are summarized as:</p> <ul style="list-style-type: none"> • the capabilities of the installed vent path, • net positive suction head for the reactor coolant system injection pumps, and • guidance to prevent negative pressure in containment. <p>As described above “the capabilities of the installed vent path” will not be formally evaluated based on the deferral of compliance with the vent portion of the EA-12-049 Order.</p> <p>Operation of reactor coolant injection pumps in relation to NPSH requirements is addressed in EPG/SAG Revision 3 and addressed accordingly in Limerick EOPs (TRIPs).</p> <p>Guidance to address potential negative pressure conditions in primary containment was assessed during procedure development in implementing EPG/SAG Revision 3.</p>
Open Item 3.2.4.2.C	With regard to elevated temperatures in general, the licensee should provide an evaluation of the impact of elevated temperatures, as a result of loss of ventilation and/or cooling, on electrical equipment being credited as part of the ELAP strategies (e.g., electrical equipment in the RCIC pump rooms).	Complete (Reference 10)
Open Item 3.4.A	The licensee should provide details that demonstrate the minimum capabilities for offsite resources will be met, per NEI 12-06	Complete (Reference 11)

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	Section 12.2.	
Confirmatory Item 3.1.1.4.A	With regard to offsite resources, confirm that the licensee develops a plan that will address the logistics for equipment transportation, area set up, and other needs for ensuring the equipment and commodities to sustain the site's coping strategies.	The following information was provided during the NRC audit to close this item: During the Strategic Alliance for FLEX Emergency Response (SAFER) Rehearsal of Concept (ROC) the LGS staging areas, travel routes and site capabilities to receive/deploy National Safer Response Center (NSRC) equipment were evaluated (refer to ROC Report). The evaluation found that Staging Area (SA) -C (Lehigh Valley Airport) was appropriately selected, located, and sized to support both receipt of NSRC equipment as well as deployment to SA-B at LGS. Personnel will be available at the station to receive and deploy the equipment should it be required. Following the NRC Audit there was a change to staging area C due to inability to reach a Memorandum of Understanding (MOU). Previous staging area D is now staging area C. The SAFER response plan has been updated to reflect this.
Confirmatory Item 3.1.5.2.A	The licensee stated that the design of the storage facilities will include provisions to ensure the equipment storage facilities are not impacted by high temperatures. Confirm that this is evaluated appropriately.	Complete (Reference 11)
Confirmatory Item 3.2.1.1.A	Benchmarks must be identified and discussed which demonstrate that Modular Accident	Complete (Reference 10)

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	Analysis Program (MAAP) is an appropriate code for the simulation of an ELAP event at LGS, consistent with the NRC endorsement of the industry position paper on MAAP.	
Confirmatory Item 3.2.1.1.8	Confirm that the collapsed reactor pressure vessel level remains above Top of Active Fuel and the reactor coolant system cool down rate is within technical specifications limits.	Complete (Reference 10)
Confirmatory Item 3.2.1.1.C	Confirm that MAAP is used in accordance with Sections 4.1, 4.2, 4.3, 4.4, and 4.5 of the June 2013 position paper.	Complete (Reference 10)
Confirmatory Item 3.2.1.1.D	Confirm that, in using MAAP, the licensee identifies and justifies the subset of key modeling parameters cited from Tables 4-1 through 4-6 of the "MAAP Application Guidance, Desktop Reference for Using MAAP Software, Revision 2" (Electric Power Research Institute Report 1 020236).	Complete (Reference 10)
Confirmatory Item 3.2.1.3.A NRC Audit Open Item	The licensee stated that the "times to complete actions in the events timeline are based on ... current supporting analyses." Confirm that the final timeline is validated once detailed designs are completed and procedures are developed.	Complete with this submittal. All time line validations have been completed using final design connection locations and station procedures. The review concluded that all strategies can be completed in the required time frames.
Confirmatory Item 3.2.1.4.A	The licensee stated that the detailed design will determine containment heat-up rate and the subsequent impacts on RCIC operation and the need for any modifications. Confirm that this evaluation is completed satisfactorily.	Complete with this submittal. A review of the BWROG RCIC paper has been completed to confirm that elevated suppression pool temperatures will support RCIC operation during a BDBEE. A review of pipe stresses at elevated temperatures was completed under Technical Evaluation 1550669-11 (posted to ePortal).

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<p>Confirmatory Item 3.2.1.4.B</p>	<p>The licensee identified two RCIC room switch set points that were above the predicted maximum temperature but pointed out that the "RCIC Equipment Room Delta Temperature High" set point was below that temperature at 109 °F. It is not clear whether or not any of the set points would have an adverse impact on the planned use of the RCIC as a mitigation strategy. Thus, further clarification is needed for this issue.</p>	<p>Complete (Reference 7)</p>
<p>Confirmatory Item 3.2.1.4.C</p>	<p>Because the Integrated Plan makes reference to use of the Phase 3 equipment as backup, the Integrated Plan should address the guidance of NEI 12-06 regarding site procedures for Phase 3 implementation. The licensee addressed this concern during the audit response and stated that LGS would ensure connection capabilities of the Phase 3 offsite equipment to site systems and would develop any procedural guidance required for those connections. Confirm that the connections for the Phase 3 equipment have been properly determined, once the details are finalized.</p>	<p>Complete (Reference 10)</p>
<p>Confirmatory Item 3.2.1.7.A</p>	<p>The licensee stated that LGS plans to abide by the generic resolution for refueling and cold shutdown conditions. The licensee stated that a review is in progress to develop a plan to address potential plant specific issues associated with implementing the generic approach. Confirm that this evaluation is completed satisfactorily.</p>	<p>Complete (Reference 12)</p> <p>Limerick Station plans to abide by this generic resolution. Exelon has incorporated the supplemental guidance provided in the NEI position paper entitled "Shutdown / Refuel Modes to enhance the shutdown risk process and procedures". Exelon has revised and approved OU-AA-103 to provide additional guidance.</p>

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<p>Confirmatory Item 3.2.1.8.A</p>	<p>The licensee stated that the final design of the FLEX pump suction will determine if additional screens are required. Confirm that the potential for entrained debris as a result of extreme external hazards (e.g., suspended solids especially during flood conditions, or from high wind debris) in the cooling water from the spray pond is addressed.</p>	<p>Complete (Reference 10)</p>
<p>Confirmatory Item 3.2.1.8.B</p>	<p>Insufficient technical information is presented or referenced in the Integrated Plan to confirm the ability of the portable FLEX pumps to deliver the required flow through the system of FLEX hoses, couplings, valves, elevation changes, etc. for the configurations described. Confirm that these evaluations are completed and documented.</p>	<p>Complete (Reference 10)</p>
<p>Confirmatory Item 3.2.2.A</p>	<p>The licensee stated that formal calculations will be performed to validate the timing required for supplying cooling water to the spent fuel pool. Confirm that these calculations are performed, with acceptable results.</p>	<p>Complete (Reference 10)</p>
<p>Confirmatory Item 3.2.4.2.A NRC Audit Open Item</p>	<p>It was not clear from the information presented in the Integrated Plan what analysis or technical basis was used to conclude that the battery room temperature rise is inconsequential. Also, no discussion was presented to address possible low temperature effects. Confirm the adequacy of the battery room ventilation to protect the batteries from the effects of elevated or lowered temperatures.</p>	<p>Complete (Reference 11)</p>
<p>Confirmatory Item 3.2.4.2.B</p>	<p>The licensee stated that battery room ventilation will be addressed through procedure changes and that the proposed methods of ventilation, open doors and fans, will be confirmed during the detailed design process. Confirm that this is completed satisfactorily.</p>	<p>Complete with this submittal. Technical Evaluation 1550669-05 (posted on ePortal) documents the battery impacts from elevated or lowered temperature. Proceduralized actions have been implemented in T-361 to address battery room ventilation.</p>

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<p>Confirmatory Item 3.2.4.4.A</p> <p>NRC Audit Open Item</p>	<p>Confirm that the proposed communications upgrades in the licensee's communications assessment are completed as planned.</p>	<p>Started</p> <p>Communications upgrade conceptual design is complete.</p> <p>For the 1st - 2nd refuel outage, (Li2R13), the Site will have 3 portable Iridium Satellite phones available for the MCR area.</p> <p>(Complete)</p> <p>Additional handheld radios for use on talk-around with spare batteries will be staged in the robust FLEX building. Bull horns for help with notifications are staged in the MCR.</p> <p>(Complete - equipment staged with other FLEX equipment awaiting Robust building completion.)</p> <p>In addition, for the 2nd – 2nd Refuel outage, (Li 1R16), the Site will complete the Nuclear Accident Reporting System (NARS) Upgrade satellite communications system along with additional satellite handsets installed in the MCR.</p>
<p>Confirmatory Item 3.2.4.5.A</p>	<p>The licensee stated that keys for access to the plant are available to security, the shift manager and to the radiation protection group. The licensee further stated that plant areas requiring access as part of the FLEX response, will be evaluated to determine if sufficient keys are available or if additional keys will be required. Confirm that this evaluation is completed.</p>	<p>Complete (Reference 11)</p>

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<p>Confirmatory Item 3.2.4.6.A</p>	<p>According to the licensee, habitability conditions will be evaluated and a strategy will be developed for the main control room. Confirm that the strategy and associated support analyses are completed.</p>	<p>Complete with this submittal. Technical Evaluation 1550669-04 (posted on ePortal) concludes that actions in the main control room will not be required until after at least 24 hours post event. Guidance for establishing ventilation has been included in a new site procedure T-362 that has been issued. Habitability conditions within the MCR and other areas of the plant will be maintained with a tool box approach limiting the impact of high temperatures with methods such as supplemental cooling, personnel rotation and/or availability of fluids.</p>
<p>Confirmatory Item 3.2.4.6.B NRC Audit Open Item</p>	<p>With regard to the fuel building habitability, the licensee acknowledged that the evaluation of the spent fuel pool area for steam and condensation has not yet been performed. Confirm that this evaluation is completed, and its resulting conclusions satisfactorily addressed.</p>	<p>Complete with this submittal. Calculation LM-0710 has been prepared to evaluate spent fuel area heat up rates (posted on ePortal). Procedure T-346 has been issued to direct these setup activities early enough following the event and before the conditions become unfavorable for hose setup.</p>
<p>Confirmatory Item 3.2.4.8.A</p>	<p>The Integrated Plan did not provide information regarding the technical basis for the selection and size of the FLEX generators to be used in support of the coping strategies. Confirm that this evaluation is satisfactorily completed.</p>	<p>Complete (Reference 10)</p>
<p>Confirmatory Item 3.2.4.10.B</p>	<p>The licensee stated minimum limit for the dc bus voltage is 105 volts. More information is needed to understand if this minimum voltage provides for sufficient operating voltages at the device terminals to ensure proper operation in support of the strategies.</p>	<p>Complete (Reference 7)</p>

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<p>Confirmatory Item 3.2.4.10.C</p>	<p>Although the licensee addressed the potential adverse impact from load shedding on main generator hydrogen control, the licensee needs to address any other potential adverse impacts to mitigation strategies resulting from the load shed plan.</p>	<p>Complete (Reference 12)</p> <p>The LGS load shed plan was reviewed against the one line drawing and determined that the additional loads being shed do not have an adverse impact on the mitigation strategies. Several key instruments were identified in early reviews and the load shed plans were altered to ensure these circuits remain energized. With this additional information, this item is complete.</p>
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Item Number	NRC Audit Open Items (Reference 12)	Status
AQ-22	<p>049-RAI- Limerick-22: Support Systems Ventilation – Battery Room. Provide a discussion of battery room ventilation to prevent hydrogen accumulation while recharging the batteries in phase 2 or 3. In your response, include a description of the exhaust path if it is different than the design basis. Also provide information on the adequacy of the ventilation provided in the battery room to protect the batteries from the effects of extreme high and low temperatures.</p>	<p>Complete with this submittal. Technical Evaluation 1550669-05 (posted on ePortal) documents the battery impacts from elevated or lowered temperature. Proceduralized actions have been implemented in T-361 to address battery room ventilation.</p>
OIP-4	<p>Identify how strategies will be deployed in all modes (OIP p. 11)</p> <p>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.</p> <p>Identification of storage areas and creation of the administrative program are open items.</p>	<p>Complete with this submittal. Storage Building locations for equipment have been identified and travel routes to point of use evaluated in Technical Evaluation 1550669-08. See Section 4 of this report for alternate equipment storage compliance method.</p>

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. 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-13-022)
2. 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
3. NRC Order EA-13-109, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013
4. Exelon Generation Company, LLC, First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design Basis External Events (Order Number EA-12-049), dated August 28, 2013 (RIS 13-123)
5. NRC Letter to Exelon Generation Company, LLC, Limerick Generating Station Units 1 and 2, Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigating Strategies) dated January 10, 2014
6. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012
7. Exelon Generation Company, LLC, Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design Basis External Events (Order Number EA-12-049), dated February 28, 2014 (RIS 14-012)
8. Exelon Generation Company, LLC, Limerick Generating Station Units 1 and 2, "Request for Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events." dated February 26, 2014 (RS-14-044)
9. NRC Letter to Exelon Generation Company, LLC, Limerick Generating Station, Units 1 and 2 - Relaxation of Certain Scheduler 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." dated April 15, 2014
10. Exelon Generation Company, LLC, Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design Basis External Events (Order Number EA-12-049), dated August 28, 2014 (RS-14-210)
11. Exelon Generation Company, LLC, Fourth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design Basis External Events (Order Number EA-12-049), dated February 27, 2015 (RS-15-021)
12. NRC Letter to Exelon Generation Company, LLC, Limerick Generating Station, Units 1 and 2 – Report for the Audit Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051, dated March 17, 2015

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13. Exelon Generation Company, LLC letter to USNRC, Request for Schedule Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events" dated April 2, 2015 (RS-15-101)
14. NRC Letter to Exelon Generation Company, LLC, Limerick Generating Station, Unit 2, 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," dated April 29, 2015
15. Exelon Generation Company, LLC letter to USNRC, Request for Second Schedule Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events" dated July 9, 2015 (RS-15-183)
16. NRC Letter to Exelon Generation Company, LLC, Limerick Generating Station, Unit 2 - 180 day 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," dated July 20, 2015

9 Attachments

1. None