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

Duke Energy Carolina, LLC (Duke Energy)
Duke Energy Carolina, LLC (Duke Energy)
McGuire Nuclear Station (MNS), Units 1 and 2
Docket Numbers 50-369, 50-370
Renewed License Numbers NPF-9 and NPF-17

Subject: 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)

References:

1. Nuclear Regulatory Commission (NRC) Order Number EA-12-049, Order Modifying Licensees With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0, dated March 12, 2012, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12054A735).

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 (ADAMS Accession No. ML12229A174).

3. NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0-A, dated August 2012.

4. Duke Energy'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 EA-12-049), dated October 29, 2012 (ADAMS Accession No. ML12307A023).

5. McGuire Nuclear Station Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses With Regard To Requirements for Mitigation Strategies for Beyond Design Basis External Events (Order EA-12-049), dated February 28, 2013, ADAMS Accession No. ML13063A185.

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6. McGuire Nuclear Station 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, ADAMS Accession No. ML13254A204.

7. McGuire Nuclear Station 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 27, 2014, ADAMS Accession No. ML14073A462.

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to Duke Energy. Reference 1 was immediately effective and directs Duke Energy 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 (OIP) 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 initial status report regarding mitigation strategies at the Oconee, McGuire and Catawba Nuclear Stations. Reference 5 provided the OIP for McGuire.

Reference 1 requires submission of a status report at six-month intervals following submittal of the OIP. Reference 3 provides direction regarding the content of the status reports. Reference 6 and 7 provided the first and second six-month status report respectively for McGuire.

The purpose of this letter is to provide the third six-month status report pursuant to Section IV, Condition C.2, of Reference 1. The attached 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 and no revision to existing Regulatory Commitments.

Should you have any questions regarding this submittal, please contact George Murphy at 980-875-5715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 27, 2014.

Sincerely,

Steven D. Capps

Enclosure:

MNS Third Six-Month Status Report (Order EA-12-049)

xc:

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ENCLOSURE

MNS THIRD SIX MONTH STATUS REPORT (ORDER EA-12-049)

McGuire Third FLEX Six Month Status Report

1 Introduction

McGuire developed an Overall Integrated Plan (OIP) (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to NRC Order EA-12-049. The Overall Integrated Plan was submitted to the NRC on February 28, 2013. The first six-month update was provided to the NRC on August 28, 2013 (Reference 3 in Section 8). The second six-month update was provided to the NRC on February 27, 2014 (Reference 5 in Section 8). This enclosure provides an update of milestone accomplishments including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any, that occurred during the period from January 28, 2014 to July 28, 2014 (hereafter referred to as "the update period").

2 Milestone Accomplishments

The following milestones were completed during the update period:

1) Complete Engineering Change Package and Plan Work Orders
2) Receive all portable FLEX equipment
3) Transmit results of Phase 2 staffing study
4) Storage Plan - Reasonable Protection Facilities Complete

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.

* The remaining effort beyond 6/20/14 will be to incorporate feedback from training.
** Portable FLEX equipment for maintaining key safety functions has been received.

Unit 1 Milestones	Target Completion Date	Activity Status	Revised Target Completion Date
Complete Engineering Change Package and Plan Work Orders	03/20/2014	Complete	
Receive all portable FLEX equipment	05/20/2014	Complete**	
Transmit results of Phase 2 staffing study	05/20/2014	Complete	
Complete all FSGs, AOPs, EOPs, OPs	06/20/2014	Started	10/31/2014*
Complete training for all FSGs, AOPs, EOPs, OPs	09/20/2014	Started	Date Not Revised
Complete all Maintenance Procedures	09/20/2014	Started	
Begin Outage (1EOC23)	Fall 2014	Not Started	Date Not Revised
Storage Plan - Reasonable Protection Facilities Complete	Fall 2014	Complete	
Regional Response Center in place	10/19/2014	Started	Date Not Revised

Unit 2 Milestones	Target Completion Date	Activity Status	Revised Target Completion Date
Complete Engineering Change Package and Plan Work Orders	03/20/2015	Started	Date Not Revised
Receive all portable FLEX equipment	05/20/2015	Started	Date Not Revised
Transmit results of Phase 2 staffing study	05/20/2015	Started	Date Not Revised
Complete all FSGs, AOPs, EOPs, OPs	06/20/2015	Started	Date Not Revised
Complete training for all FSGs, AOPs, EOPs, OPs	09/20/2015	Started	Date Not Revised
Complete all Maintenance Procedures	09/20/2015	Started	Date Not Revised
Begin Outage (2EOC23)	Fall 2015	Not Started	Date Not Revised
Storage Plan - Reasonable Protection Facilities Complete	Fall 2014	Complete	
Regional Response Center in place	10/11/2015	Started	Date Not Revised

4 Changes to Compliance Method

The following summarizes the changes to the compliance method as documented in the Overall Integrated Plan that were made during the update period. These changes do not impact McGuire Station's compliance with NEI 12-06.

1) Change: The OIP for McGuire (Reference 1) identified that a containment analysis was performed based on seal leakage that decreased with RCS pressure over time (assuming the original leak-off piping configuration). A modification to each of the four Reactor Coolant Pump (RCP) #1 seal leak-off lines has been added to the FLEX scope and is required to address an issue relating to recently discovered seal behavior at lower Reactor Coolant System RCS pressures during Extended Loss of all A.C. Power (ELAP) cooldown (Reference 6). Evaluation of this behavior showed the original piping configuration could allow leak-off flow rates in excess of WCAP-17601-P (Reference 7) assumptions.

   Justification: The planned modification to each of the four RCP seal leak-off lines involves the addition of a restriction orifice downstream of the seal exit. Analysis of this new piping configuration shows that initial leak-off flow rates, and those experienced during subsequent RCS cooldown, stay within the maximum limits of current WCAP-17601-P assumptions (i.e., 21 gpm/seal).

   Documentation: Open Item #57

2) Change: The OIP for McGuire (Reference 1) identified that a modification would be implemented in Phase 1 to provide assured air to the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) flow control valves and the Steam Generator Power Operated Relief

Valves (SG PORVs) to allow these valves to be operated from the Control Room until a source of makeup air can be provided in Phase 2. In lieu of this, manual action will temporarily be credited for the Phase 1 FLEX response. The Phase 1 assured air portion of this modification will be deferred until the Unit 2 Refueling Outage (RFO) in fall 2015, in order to allow further preparations to be made on the already-installed accumulator tanks for both Units. The FLEX Phase 2 air compressor connections on the seismically robust Blackout header will be installed to support Unit 1 Phase 2 FLEX response as scheduled.

Justification: As Unit 1 is the first of two Units to implement FLEX Order EA-12-049, additional Phase 1 staffing from Unit 2 will be available until Unit 2 implements the Order in fall of 2015. For Unit 1 implementation, staffing that will be needed to perform Unit 2 ELAP actions after Unit 2 implementation will be credited in the Unit 1 Phase 1 response for local control of the TDAFWP flow control valves and the SG PORVs (Reference 9). Upon implementation of the Order on Unit 2, the air supply to the TDAFWP flow control valves and SG PORVs will be assured via completion of the plant modification, allowing remote control of these components from the Control Room per the OIP.

Documentation: Open Item #1

3) Change: McGuire Second Six-Month Status Report dated 2/27/14 (Reference 5) identified, as Open Item 52, that the time margin between the calculated station battery run-time for the FLEX strategy and the expected deployment time for FLEX equipment to supply the dc loads is 14 hours. As response strategies were finalized, revisions to FLEX Support Guidelines (FSGs) changed the time margin to 4 hours.

Justification: Time margin between station battery depletion and deployment of FLEX equipment to repower battery chargers remains reasonable, and maintains compliance with the NRC-endorsed "Battery Life Issue" generic open item (Reference 8).

Documentation: Open Item #52

4) Change: The OIP for McGuire (Reference 1) identified that in Phase 2, the primary and alternate strategies for use of the Hydrogen Igniters would be to repower one train for the primary strategy, and the other train for the alternate strategy. As the FLEX Portable Power Distribution System already provides for a primary and alternate strategy for repowering a train of igniters (also as described in the OIP), only one train (Train A) will be repowered.

Justification: McGuire Nuclear Station, Units 1 and 2 are ice condenser containment designs. NEI 12-06, Section 3.2.1.3 (6) "Initial Conditions" identifies that:
"Permanent plant equipment that is contained in structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles, are available."
The A train of hydrogen igniters is located inside containment, and the igniters have been evaluated as seismically robust.

Documentation: Open Item #6

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

McGuire expects to comply with the order implementation date and no relief/relaxation is required at this time contingent on the following:

1. NRC approval of License Amendment Request for the "Assured AFW Suction Source" (TAC Nos. MF 2741, 2742)

6 Open Items

NRC Endorsed Generic Issues:

- McGuire Nuclear Station confirms that the FLEX strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's FLEX strategy as outlined in the NEI white paper on Extended Battery Duty Cycles. The detailed licensee calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 are available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the FLEX strategy and the expected deployment time for FLEX equipment to supply the dc loads is 4 hours.

- McGuire Nuclear Station will incorporate the supplemental guidance provided in the NEI position paper entitled "Shutdown/Refueling Modes" to enhance the shutdown risk process and procedures.

- Electric Power Research Institute (EPRI) Report 3002000623 entitled "Nuclear Maintenance Applications Center: Preventive Maintenance Basis for FLEX Equipment,". McGuire Nuclear Station will follow EPRI Report 30002000623 in the development of maintenance and testing programs for equipment acquired in response to Mitigation Strategies Order EA-12-049, or take justified vendor exception as appropriate.

- McGuire Nuclear Station will incorporate the guidance provided in the Westinghouse position paper entitled "Westinghouse Response to NRC Generic Request for Additional Information (RAI) on Boron Mixing in support of the Pressurizer Water Reactor Owners Group (PWROG)" (ADAMS Accession Number ML13235A135) with the following clarifications:
  1. The required timing for providing borated makeup to the primary system should consider conditions with no reactor coolant system leakage and with the highest applicable leakage rate for the reactor coolant pump seals and unidentified reactor coolant system leakage.
  2. For the condition associated with the highest applicable reactor coolant system leakage rate, two approaches have been identified, either of which is acceptable to the staff:
     a. Adequate borated makeup should be provided such that the loop flow rate in two phase natural circulation does not decrease below the loop flow rate corresponding to single-phase natural circulation.
     b. If loop flow during two-phase natural circulation has decreased below the single phase natural circulation flow rate, then the mixing of any borated primary makeup added to the reactor coolant system is not to be credited

until one hour after the flow in all loops has been restored to a flow rate that is greater than or equal to the single-phase natural circulation flow rate.

In all cases, credit for increases in the reactor coolant system boron concentration should be delayed to account for the mixing of the borated primary makeup with the reactor coolant system inventory. Provided that the flow in all loops is greater than or equal to the corresponding single-phase natural circulation flow rate, the staff considers a mixing delay period of one hour following the addition of the targeted quantity of boric acid to the reactor coolant system to be appropriate.

The NRC has recently endorsed 2 other Generic Issues associated with FLEX:

1. Use of the MAAP4 computer code in simulating the Extended Loss of AC Power (ELAP) event for Boiling Water Reactors (BWR). McGuire Nuclear Station will not abide by this generic resolution as it does not apply.

2. Westinghouse report entitled "Westinghouse Response to NRC Generic Request for Additional Information (RAI) on CENTS Code in Support of the Pressurized Water reactor Owners Group (PWROG)" Combustion Engineering Plants. This generic resolution does not apply and McGuire Nuclear Station will not abide by it.

The following tables provide a summary status of the Open Items. The table under Section 6.a provides the open items identified in the original OIP submitted on February 28, 2013. The table under Section 6.b provides a list of open items that were added after February 28, 2013. The table under 6.c provides a list of open items related to the Interim Staff Evaluation (ISE) received on January 16, 2014.

a. Open Items Documented in the Overall Integrated Plan.

Note: status of items marked with an asterisk (*) are designed and awaiting implementation.

Note: status of items marked with a double asterisk (**) have been completed during this update period.

	Overall Integrated Plan Open Item	**Status**
1	Implement plant modification: Assured Air to the TDAFWP FCVs and SG PORVs	Started*
2	Implement plant modification: Assured Water Supply to the TDAFWPs	Started*
3	Implement plant modification: SFP Wide-Range Level Instrumentation	Started*
4	Implement plant modification: UHF Communication System Upgrades	Started*
5	Implement plant modification: Process	Started*

	Connections	
6	Implement plant modification: Permanent Connections for Portable Electrical Equipment	Started*
7	Implement plant modification: FLEX Storage Facilities	Completed**
8	Implement plant modification: Submersible Ground Water Sump Pump	Started*
9	Implement plant modification: FLEX Strategy Implementation	Started*
10	Implement plant modification: "B" RN to CA Pump Suction Re-route	Started*
11	Implement plant modification: Install Emergency Hardhat Light Storage Boxes and Hardhat Hooks	Complete
12	A staffing Phase 2 study will be performed in accordance with NEI 12-01 to verify that actions can be taken in accordance with the timeline. Time constraints shown in Attachment 1A will be validated to be reasonable as the strategy is finalized. (Revised in Second Six Month Update)	Started
13	An analysis was performed in Duke Energy Calculation MCC-1223.31-00-0012 that indicates that flooding will not occur for at least 48 hours. This analysis will be revised to demonstrate that this time remains unaffected even if potential sources of water from Auxiliary Building or Turbine Building flooding are considered.	Completed
14	A calculation will be performed to demonstrate that sufficient negative reactivity can be added through use of a pump and a reactor coolant system vent path to achieve xenon free cool down in accordance with the PWROG FSG guidelines.	Completed**
15	Complete vital battery area room ~~heatup and~~ (see open item #48) hydrogen accumulation calculation to determine if portable fans or HVAC units may be required, and timeframe for deployment.	Completed. Description of this Open Item revised per Open Item 48

16	Complete a calculation to determine when elevated interior doghouse temperatures adversely impact the FLEX strategy and to evaluate methods for mitigation.	Completed
17	An evaluation will be performed to determine how long raw water can be used to supply SGs without excessively affecting SG capability to remove heat and provide steam to the TDAFW pump. This will help determine when Phase 3 equipment may be needed to assist in providing cleaner water sources.	Completed
18	MNS will evaluate the need to provide freeze protection for critical instrumentation and exposed FLEX connections.	Completed
19	Methods will be initiated to circulate and cool air in lower containment sub compartments to prevent any adverse impact on critical instrumentation. The response time is based on engineering judgment and will be confirmed by analysis.	Completed**
20	Deployment routes will be established and are expected to be utilized to transport FLEX equipment to the deployment areas. The identified paths and deployment areas will be accessible during all modes of operation. This deployment strategy will be included within an administrative program in order to keep pathways clear or actions to clear the pathways.	Started
21	MNS will implement programmatic controls in accordance with NEI 12-06. Procedures and guidelines will be reviewed and revised and/or generated as required to address additional programmatic controls as a result of FLEX requirements.	Started

22	Equipment associated with FLEX mitigation strategies will be procured as commercial equipment with design, storage, maintenance, testing, and configuration control in accordance with NEI 12-06 Section 11.1.	Started
23	Installed structures, systems and components pursuant to 10 CFR 50.63(a) will continue to meet augmented guidelines of Regulatory Guide (RG) 1.155, Station Blackout.	Completed**
24	The unavailability of equipment and applicable connections that directly perform a FLEX mitigation strategy will be managed using plant equipment control guidelines developed in accordance with NEI 12-06 Section 11.5.	Started
25	Programs and processes will be established to ensure that personnel proficiency in the mitigation of beyond-design-basis events is developed and maintained in accordance with NEI 12-06 Section 11.6.	Started
26	The FLEX strategies and basis will be maintained in overall FLEX basis documents.	Started
27	Existing plant configuration control documents will be modified to ensure that changes to the plant design, physical plant layout, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX strategies in accordance with NEI 12-06 Section 11.8.	Started
28	Training will be initiated through the Systematic Approach to Training (SAT) process. Training will be developed and provided to all involved plant personnel based on any procedural changes or new procedures developed to address and identify FLEX activities. Applicable training will be completed prior to the implementation of FLEX.	Started

29	The industry will establish two Regional Response Centers (RRCs) to support utilities during beyond-design-basis events.	Started
30	The N+1 FLEX storage facilities will be designed in accordance with ASCE 7-10, Minimum Design Loads for Buildings and Other Structures. The FLEX storage facilities will be designed in accordance with ASCE 7-10, to withstand the maximum anticipated hurricane and tornado winds as outlined in NEI 12-06. The FLEX buildings will be located in accordance with NEI 12-06 Section 7.3.1 to prevent damage to more than one of the three facilities due to tornado missiles.	Completed**
31	FLEX storage facilities will be located above any potential site flood level, and/or the effects of localized flooding will be evaluated in the FLEX facility design and equipment deployment.	Completed**
32	Debris removal/remediation equipment and procedures will be provided to support FLEX equipment deployment.	Completed**
33	Snow and ice removal/remediation equipment and procedures will be provided to support FLEX equipment deployment.	Completed**
34	FLEX equipment will be capable of operation under extreme temperatures, and suitably maintained to ensure standby readiness. FLEX storage facilities will be designed to accommodate maximum snow and ice loading. FLEX storage facilities will be vented to maintain acceptable temperature.	Completed**
35	An evaluation will be performed to ensure that the 300 gpm pump is capable of adequate flow and pressure to support feed and bleed core cooling in typical Mode 5 and Mode 6 configurations.	Completed**

36	Since the overall FLEX strategy is aimed at preventing core damage, the engineering change process will drive out an evaluation to prioritize operator actions associated with containment isolation as time allows. For example, the containment isolations to the Containment Ventilation Unit Condensate Drain Tank (VUCDT) will be closed first since this path connects containment atmosphere directly to the Auxiliary Building.	Completed
37	An analysis will be performed to validate that containment spray for temperature/pressure control is not required over the long term. If the long term containment analysis determines that containment temperature and/or pressure will reach unacceptable levels over the long term, connections will be installed for containment spray mitigating strategies and will be used with the portable diesel driven pumps to supply water from the UHS to the connections located in the Auxiliary Building.	Completed**
38	Fans in containment that circulate air will be restored as required to cool the cubicle areas and to prevent the increase in temperature from having an adverse impact on essential instrumentation. The engineering change process will drive out an evaluation to determine the appropriate timing of these actions.	Completed**
39	Evaluate other long term strategies for cooling containment such as circulating the air volume in the annulus.	Completed**
40	In order to prevent or mitigate this inevitability [i.e., vital battery depletion]: 1. Portable power distribution equipment will be used to repower the vital batteries, or 2. An alternate strategy to deploy portable generators and cables will be developed to directly reestablish power to the power supplies in the 7300 cabinets	Completed**

	thereby re-powering the instrumentation loops, or 3. An alternate strategy to utilize handheld instruments will be developed to tap into the instrument loops locally to monitor essential parameters.	
41	An analysis was completed to demonstrate that adequate control room cooling would be available if action was taken to open various doors at around 2 hours after the event occurs. This action will be incorporated into procedures.	Completed
42	An evaluation will be performed to determine diesel fuel, gasoline and two-cycle oil requirements for Phase 1 and Phase 2 portable equipment.	Completed
43	Analysis will be performed to determine commodities requirements.	Completed**
44	Evaluate SFP to ensure predicted makeup water dilution rates in the Spent Fuel Pools for the coping strategies described herein are bounded.	Completed
45	Analysis will be performed to determine radiation protection equipment requirements.	Completed
46	These instruments [i.e., Essential Instrumentation and Vital I&C] will be used in the FSGs in accordance with the PWROG guidance. Setpoint uncertainty analyses will be developed in accordance with PWROG guidance.	Completed**
47	A portable battery pack with inverter is also being evaluated for use. The battery pack would be rapidly deployed for use to close the CLA motor-operated valves (MOVs) outside of containment penetration without reliance on the valve's limit or torque switches or the valve's relay circuitry.	Completed

b. Open Items added after February 28, 2013

Note: status of items marked with a double asterisk (**) have been completed during this update period.

	First Six Month Update New Open Items	Status
48	Complete vital battery area room heatup calculation to determine if portable fans or HVAC units may be required, and the timeframe for deployment. (Reference open item 15)	Completed
49	To facilitate the Phase 2 FLEX mitigation response, the high and low pressure make-up pumps for the Reactor Coolant System for each Unit are currently planned to be pre-staged in the Auxiliary Building, near the FLEX connection points. As these areas are within a Category I seismic structure, no spares will be stored in the FLEX buildings for deployment, since "N" pieces of FLEX equipment are already deployed and protected. Per NEI 12-06 guidance, this equipment will be evaluated for seismic ruggedness.	Completed
50	Access to connection points for the Phase 2 FLEX mitigation response will be through the north end of the McGuire Auxiliary Building, an area which is not seismically designed. Section 5.3.2 part 2 of the NEI 12-06 Guidance Document states: "At least one connection point of FLEX equipment will only require access through seismically robust structures. This includes both the connection point and any areas that plant operators will have to access to deploy or control the capability." Evaluate Auxiliary Building access points for possible qualification of seismic ruggedness.	Completed
51	Reference OI #30. NEI 12-06 Guidance clarification documented in NEI FLEX Guidance Inquiry no. 2013-07 identifies that FLEX buildings designed for hurricane wind speeds and using diverse locations per Section 7.3.1 part (c) are protected from both tornado and hurricane generated missiles. Validate strategy with NEI.	Completed

	Second Six Month Update New Open Items	Status
52	McGuire to confirm that the FLEX strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's FLEX strategy as outlined in the NEI white paper on Extended Battery Duty Cycles. The detailed licensee calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 will be available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the FLEX strategy and the expected deployment time for FLEX equipment to supply the dc loads is 4 hours.	Completed** Description of this Open Item revised to reflect Section 4, change #3
53	See ISE Open Item 3.2.1.8.A. The PWROG submitted to NRC a position paper, dated August 15, 2013, which provides test data regarding boric acid mixing under single-phase natural circulation conditions and outlined 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. McGuire to confirm its intent to abide by the generic approach discussed above, and address the clarifications in the NRC endorsement letter dated January 8, 2014.	Completed**
54	NEI submitted the EPRI Report 3002000623 entitled "Nuclear Maintenance Applications Center: Preventative Maintenance Basis for FLEX Equipment" on October 23, 2013. McGuire to confirm its intent to abide by the generic approach discussed above in developing FLEX equipment maintenance and testing programs.	Completed**

55	See ISE Confirmatory Item 3.2.1.7.A. McGuire to confirm that the guidance in NEI position paper, "Position Paper: Shutdown/Refueling Modes," will be followed in the Mitigation Strategies for BDBEEs occurring during Shutdown/Refueling Modes.	Completed**
56	McGuire to confirm viability of proposed long-term ELAP Phase 3 recovery strategy: Modes 1-4: rely on passive ice condenser response and repowered containment/annulus ventilation fan cooling to prevent Pressurizer/Steam Generator level indication reference legs from flashing during RCS cooldown/depressurization, and realign/restart RHR system (and support systems). Manage containment pressure as necessary. Modes 5-6: rely on passive ice condenser response and deploy portable FLEX pump within timeframe necessary to manage RCS boration/inventory. Manage containment pressure as necessary and realign/restart RHR system (and support systems).	Started
	New Open Items added this Update	**Status**
57	NSAL 14-1: Upon completion of the vendor evaluation of the RCP seal leak-off flow with the installed Number 1 Seal Leak-off orifice, identify the path forward for meeting the FLEX Mitigation Strategy Analysis assumptions based on the evaluated leak-off flow.	Started

c. Interim Staff Evaluation

Note: status of items marked with a double asterisk (**) have been completed during this update period.

	Interim Staff Evaluation Open Item	Status
3.2.1.8.A	The PWROG submitted to NRC a position paper, dated August 15, 2013, which provides test data regarding boric acid mixing under single-phase natural circulation conditions and outlined 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. During the audit process, the licensee informed the NRC staff of its intent to abide by the generic approach discussed above. The licensee should address the clarifications in the NRC endorsement letter dated January 8, 2014.	Completed**
	Interim Staff Evaluation Confirmatory Item	**Status**
3.1.1.2.A	Deployment of FLEX equipment - On page 57 of its Integrated Plan, in the chart identifying Pressurized Water Reactor (PWR) Portable Equipment Phase 2, the licensee lists (9) 9×12 trailers used to store and deploy power equipment, but does not list tow vehicles. Confirm abilities to move FLEX equipment and the level of protection afforded the means to move.	Completed
3.1.1.3.A	Procedural interfaces, seismic - Confirm evaluation that shows time is available to deploy ground water sump pumps as needed in critical locations in addition to the vicinity of the TDAFW pump.	Completed**
3.1.1.4.A	Off Site Resources, seismic - Confirm development of the MNS playbook as well as identification of the local Assembly Area and routes to the plant.	Started
3.1.3.1.A	Protection of FLEX equipment, high winds - Site specific data to justify the assumed tornado width of 1200 feet will be required to confirm the final locations of the FLEX storage facilities conform to NEI 12-06 guidance.	Completed
3.1.5.2.A	Deployment of FLEX equipment, high	Completed

	temperatures - Confirm that the storage facilities will be designed for extreme temperature ranges including concerns for expansion of sheet metal, swollen door seals, etc.	
3.2.1.A	RCS Cooling and Heat Removal, and RCS Inventory Control Strategies - Justify the use of the analysis from Sections 5.2.1 and 5.2.2 of WCAP-17601-P by identifying and evaluating the important parameters and assumptions demonstrating that they are representative of MNS and appropriate for simulating the ELAP transient.	Completed
3.2.1.1.A	Computer Code Used for ELAP Analysis – Confirm that reliance on the NOTRUMP code for the ELAP analysis of Westinghouse plants is limited to the flow conditions prior to reflux condensation initiation. This includes specifying an acceptable definition for reflux condensation cooling.	Completed
3.2.1.2.A	RCP seals - Confirm that the RCP seal initial maximum leakage rate used in the analysis is greater than or equal to the upper bound expectation for the ELAP event (21 gpm/seal) discussed in the PWROG white paper addressing the RCP seal leakage for Westinghouse plants.	Completed
3.2.1.2.B	RCP seals - In some plant designs, such as those with 1200 to 1300 psia SG design pressures and no accumulator backing of the main steam system power-operated relief valve (PORV) actuators, the cold legs could experience temperatures as high as 580 degrees F before cooldown commences. This is beyond the qualification temperature (550 degrees F) of the O-rings used in the RCP seals. For those Westinghouse designs, a discussion of the information (including the applicable analysis and relevant seal leakage testing data) should be provided to justify that (1) the integrity of the associated O-rings will be maintained at the temperature conditions experienced during the ELAP event, and (2) the seal leakage rate of 21 gpm/seal used in the ELAP is adequate and acceptable.	Completed

3.2.1.2.C	RCP seals - If the 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.	Completed
3.2.1.3.A	Decay Heat - Values of the following key parameters used to determine the decay heat should be specified and the adequacy of the values evaluated: (1) initial power level, (2) fuel enrichment, (3) fuel burnup, (4) effective full power operating days per fuel cycle, (5) number of fuel cycles, if hybrid fuels are used in the core, and (6) fuel characteristics are based on the beginning of the cycle, middle of the cycle, or end of the cycle.	Completed
3.2.1.4.A	Initial Values for Key Plant Parameters and Assumptions – Confirm results and appropriate actions subsequent to Westinghouse supplying McGuire with additional information regarding the key plant parameters and assumptions.	Completed
3.2.1.7.A	Confirm that MNS will abide by the generic resolution for shutdown and refueling concerns.	Started
3.2.3.A	Containment Functions Strategies - Confirm completion of the long term containment analysis and appropriate actions.	Completed**
3.2.4.4.A	Lighting and Communications - Confirmation will be required that upgrades to the site's communications systems have been completed.	Started
3.2.4.6.A	Ventilation for Equipment Cooling and Personnel Habitability - Room heat up response for specific MNS areas are completed but need to be evaluated by NRC personnel. Confirm completion of evaluation and appropriate actions.	Completed

3.2.4.7.A	Water Sources - Confirm that plant procedures specify that a flow path is promptly established for makeup flow to the steam generators and identify backup water sources in order of intended use; and that plant procedures/guidance should specify clear criteria for transferring to the next preferred source of water.	Completed**
3.2.4.8.A	Electrical Power Sources - Confirm completion of Flex DG sizing calculation and appropriate actions.	Completed**
3.2.4.9.A	Portable Equipment Fuel - Confirm completion of evaluation and appropriate actions to assess long-term FLEX equipment fuel oil requirements.	Completed**
3.2.4.10.A	The battery sizing calculation needs to be verified when revised to show that dc power for 2 of 4 channels can be maintained for 24 hours without a charger. in place.	Completed**
3.2.4.10.B	Load Reduction to Conserve DC Power - Confirm that ELAP procedures/guidance will direct operators to conserve dc power during the event by stripping nonessential loads as soon as practical.	Completed
3.4.A	Offsite Resources - Confirm NEI 12-06, Section 12.2, Guidelines 2 through 10 are addressed with the RRC.	Started

7 Potential Interim Staff Evaluation Impacts

There are no potential impacts to the Interim Staff Evaluation identified at this time.

8 References

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

1. McGuire Nuclear Station Overall Integrated Plan in Response to March 12, 2012 Commission Order to Modify Licenses With Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events (Order EA-12-049), dated February 28, 2013, ADAMS Accession No. ML 13063A185.
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. McGuire Nuclear Station, 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 ML 13254A204.
4. William B. McGuire Nuclear Station, Units 1 and 2—Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) dated January 16, 2014 ML 13338A421.
5. McGuire Nuclear Station, 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 27, 2014 ML 14073A462.
6. NSAL-14-1, "Impact of Reactor Coolant Pump No. 1 Seal Leakoff Piping on Reactor Coolant Pump Seal Leakage During a Loss of All Seal Cooling," dated February 19, 2014.
7. WCAP-17601-P, "Reactor Coolant System Response to ELAP for Westinghouse, Combustion Engineering and B&W NSSS Designs", August 2012.
8. NEI letter "EA-12-049 Mitigating Strategies Resolution of Extended Battery Duty Cycles Generic Concern" dated August 27, 2013 (ML 13241A186), and NRC endorsement letter dated September 16, 2013 (ML 13241A188).
9. EP/1/A/5000/ECA-0.0 (draft dated 8/8/14).