



Steven D. Capps  
Vice President  
McGuire Nuclear Station

Duke Energy  
MG01VP | 12700 Hagers Ferry Road  
Huntersville, NC 27078

o: 980.875.4805  
f: 980.875.4809  
Steven.Capps@duke-energy.com

10 CFR 50.4

February 27, 2014  
Serial: MNS-14-019

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

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

**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. 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, dated August 2012, ADAMS Accession No. ML12242A378
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.
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.

A151  
NRR

Ladies and Gentlemen,

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 directed 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 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 Duke Energy initial status report regarding mitigation strategies at the Oconee, McGuire and Catawba Nuclear Stations. Reference 5 provided the Duke Energy overall integrated plan for MNS.

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 provided the first six-month status report for the MNS. 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 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 February 27, 2014.

Sincerely,



Steven D. Capps

Enclosure:

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

xc:

V.M. McCree, Region II Administrator  
U.S. Nuclear Regulatory Commission  
Marquis One Tower  
245 Peachtree Center Avenue NE, Suite 1200  
Atlanta, Georgia 30303-1257

John Boska, Project Manager (ONS)  
U.S. Nuclear Regulatory Commission  
One White Flint North, Mailstop O-8G9A  
11555 Rockville Pike  
Rockville, MD 20852-2738

J. C. Paige, Project Manager (CNS & MNS)  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Mail Stop 8 G9A  
Rockville, MD 20852-2738

J. Zeiler  
NRC Senior Resident Inspector  
McGuire Nuclear Station

Justin Folkwein  
American Nuclear Insurers  
95 Glastonbury Blvd., Suite 300  
Glastonbury, CT 06033-4453

**ENCLOSURE**

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

**ENCLOSURE**

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

# ENCLOSURE

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

### 1 Introduction

McGuire 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. 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). 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 July 31, 2013 to January 31, 2014 (hereafter referred to as “the update period”).

### 2 Milestone Accomplishments

No milestones were completed during the update period.

### 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.

Notes:

\* The remaining planning effort beyond 3/20/14 involves one of the strategies that does not involve physical plant changes.

\*\*The remaining effort beyond 6/20/14 will be to incorporate feedback from training.

Unit 1 Milestones	Target Completion Date	Activity Status	Revised Target Completion Date
Complete Engineering Change Package and Plan Work Orders	03/20/2014	Started	05/01/2014*
Receive all portable FLEX equipment	05/20/2014	Started	Date Not Revised
Transmit results of Phase 2 staffing study	05/20/2014	Started	Date Not Revised
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	Date Not Revised
Begin Outage (1EOC23)	Fall 2014	Not Started	Date Not Revised
Storage Plan - Reasonable Protection Facilities Complete	Fall 2014	Started	Date Not Revised
Regional Response Center in place	10/19/2014	Started	Date Not Revised

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

<b>Unit 2 Milestones</b>	<b>Target Completion Date</b>	<b>Activity Status</b>	<b>Revised Target Completion Date</b>
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	Started	Date Not Revised
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: To facilitate the Phase 2 FLEX mitigation response, the high and low pressure make-up pumps for the Reactor Coolant System for each Unit will be the diesel-driven type deployed to the station yard, and stored in the FLEX buildings. A total of N+1 pumps for each service condition (i.e., Modes 1-4 or Modes 5-6) will be procured (three for McGuire). Initially, these pumps were identified to be the electric type powered from the FLEX Phase 2 diesel generators and would have been pre-staged in the Auxiliary Building.

Justification: Diesel-driven pumps can be deployed and put in service more quickly, which facilitates the ELAP response. This deployment/storage strategy is in compliance with NEI 12-06 guidance as noted in the McGuire FLEX Interim Staff Evaluation dated 1/16/14.

Documentation: Open Item #49

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

- 2) Change: The McGuire Overall Integrated Plan dated February 28, 2013, indicated that the primary SG feed connection for each Unit is a pre-existing connection installed pursuant to B.5.b and can be used in conjunction with the portable FLEX pumps to provide makeup to all four steam generators. For the alternate SG feed connections, a plant modification would provide the required configuration in the interior and exterior Doghouses that can supply makeup to all four steam generators. Attachment 4B, sheet 3 of the OIP, identified two alternate SG feed connections in each of the interior and exterior Doghouses; the final configuration for the modification will change to be just one alternate SG feed connection inside each of the interior and exterior Doghouses, capable of feeding two SGs and providing simultaneous, parallel makeup to all four SGs as originally described.

Justification: The primary connection (B.5.b) remains unchanged; the alternate connections have been reduced in number only and are still located inside Category I structures. Capability to parallel feed all four SGs simultaneously is maintained.

Documentation: Open Item #5

- 3) Change: The McGuire Overall Integrated Plan dated February 28, 2013, identified that portable power equipment required for FLEX mitigation strategies in Phase 2 will be connected using both a primary approach and an alternate approach in accordance with NEI 12-06. The primary approach in the OIP uses permanently installed modified MCC buckets with external power connectors to provide power to specific components; the alternate approach uses portable MCC buckets with external power connectors deployed from the FLEX Buildings. For FLEX mitigation equipment utilized later in the event for long-term Containment cooling (i.e., >24 hours post-ELAP) portable MCC buckets will be deployed from the FLEX Buildings. There will be no permanently installed modified buckets for the equipment used in the Phase 3 response.

Justification: Table D-2 of NEI 12-06 indicates (under Containment Function "Performance Attributes") that "Due to the long-term nature of this function, the connection does not need to be a permanent modification. However, if a temporary connection, e.g., via valve bonnet, then this should be pre-identified."

Documentation: Open Item #6



# ENCLOSURE

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

- 4) Change: The McGuire Overall Integrated Plan dated February 28, 2013, identified that the Auxiliary Feedwater Storage Tank (CAST) would be the primary assured source of water to the TDAFWP for all ELAP events with the exception of tornado and high wind events that could render the CAST unavailable, at which time embedded CCW piping inventory would provide the assured source. Due to issues with seismic modification of the CAST to withstand the SSE event, the assured water source for all ELAP events (including seismic) will now be the captive service water inventory in the embedded large-bore CCW piping.

Justification: The captive CCW inventory provides an adequate supply of water (and adequate NPSH) for TDAFW pump operation in Phase 1 and Phase 2. This supply provides ample time to configure a portable FLEX SG feedwater pump from the UHS, or realign the TDAFWP suction to the UHS through manual action. The large-bore CCW piping has been evaluated for seismic ruggedness to withstand the SSE event and found to be acceptable; further analysis of branch lines is ongoing to provide procedural guidance for needed isolations.

Documentation: Open Item #2

- 5) Change: The McGuire Overall Integrated Plan dated February 28, 2013 identified that installed submersible sump pumps with permanent cable connections between the pumps and FLEX diesel generator connection points at approximately grade level would be provided, and that all components would be located in a Category I structure (i.e., in the AFW Pump Rooms). The sump pumps will change to be portable and deployed from the FLEX Buildings; cable will be routed from the FLEX diesel generator to the pumps at the time of deployment.

Justification: The sump pumps will be used in a support capacity to protect the TDAFW pump during Phase 2. While NEI 12-06 does not require N+1 capability for support functions, N+1 portable sump pumps are provided and ample time for deployment is available based on the internal flooding evaluation.

Documentation: Open Item #8

- 6) Change: The McGuire Overall Integrated Plan dated February 28, 2013, identified that additional Technical Support Center (TSC) antennae would be provided for portable satellite phones. It has been determined that the portable satellite phones will be used line-of-site and not via antenna, so no additional TSC antennae will be provided.

Justification: Compliance with NEI 12-06, Section 3.2.2, Guideline (8) is maintained; this change simply removes the originally planned additional TSC antennae since they are not needed for TSC offsite communications.

Documentation: Open Item #4

# ENCLOSURE

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

- 7) Change: The McGuire Overall Integrated Plan dated February 28, 2013, identified in the “General Integrated Plan Elements” section that a Phase 2 Staffing Study would be performed to validate that all actions in Attachment 1A (the ELAP Sequence of Events Timeline) can be taken in accordance with the timeline. As clarification, the Phase 2 Staffing Study will validate that required actions within the first 6 to 8 hours after onset of the ELAP event can be taken in accordance with the timeline. Beyond 8 hours, additional staffing will be available; required actions beyond 8 hours will be confirmed through FLEX Support Guideline (FSG) validation.

Justification: NEI 12-01, Section 1.3.1.2 “Phase 2 Staffing Assessment” guidance states:

“In accordance with the Order, each licensee must develop new strategies for mitigating the effects of beyond-design-basis external events. To ensure accurate results, the staffing assessment for response functions related to NTTF Recommendation 4.2 must be based on the actions delineated in the procedures and guidelines developed in response to the Order. Once the site-specific actions associated with the new response strategies are defined (e.g., down to the procedure or guideline step level), the staffing needed to perform these actions can be assessed with the necessary level of accuracy.”

For the Phase 2 Staffing Study, the draft FSGs that have been developed will be used to validate that NTTF Recommendation 4.2 strategies can successfully be deployed prior to additional support personnel arriving on site at about 6 to 8 hours after onset of the event.

Documentation: Open Item #12

### **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)
2. NRC endorsement of Industry Generic Issue for RCP Seal Leakage

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

**6 Open Items**

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 in the process of detailed design.

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

	<b>Overall Integrated Plan Open Item</b>	<b>Status</b>
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 Connections	Started
6	Implement plant modification: Permanent Connections for Portable Electrical Equipment	Started
7	Implement plant modification: FLEX Storage Facilities	Started
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*

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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 all 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.	Started. Description of this Open Item revised to reflect Section 4, change #7.
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.	Started
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

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Started
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.	Not Started

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Started
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

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Not 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.	Started
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.	Started

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

32	Debris removal/remediation equipment and procedures will be provided to support FLEX equipment deployment.	Started
33	Snow and ice removal/remediation equipment and procedures will be provided to support FLEX equipment deployment.	Started
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.	Started
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.	Started
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



# ENCLOSURE

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

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.	Started
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.	Started
39	Evaluate other long term strategies for cooling containment such as circulating the air volume in the annulus.	Started
40	In order to prevent or mitigate this inevitability [i.e., vital battery depletion]: <ol style="list-style-type: none"><li>1. Portable power distribution equipment will be used to re-power the vital batteries, or</li><li>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 thereby re-powering the instrumentation loops, or</li><li>3. An alternate strategy to utilize handheld instruments will be developed to tap into the instrument loops locally to monitor essential parameters.</li></ol>	Started

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Started
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.	Started
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.	Evaluation completed - concluded not to use portable battery pack.

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

b. Open Items added after February 28, 2013

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

	<b>First Six Month Update New Open Items</b>	<b>Status</b>
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** Description of this Open Item revised to reflect Section 4, change #1
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	Completed**

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

	generated missiles. Validate strategy with NEI.	
	<b>New Open Items Added in this Update</b>	<b>Status</b>
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 14 hours.	Completed**
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.	Started
54	NEI submitted the EPRI Report 3002000623 entitled "Nuclear Maintenance Applications Center: Preventative Maintenance Basis for FLEX	Started

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

	<p>Equipment” on October 23, 2013.</p> <p>McGuire to confirm its intent to abide by the generic approach discussed above in developing FLEX equipment maintenance and testing programs.</p>	
55	<p>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.</p>	Started
56	<p>McGuire to confirm viability of proposed long-term ELAP Phase 3 recovery strategy:</p> <p>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.</p> <p>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).</p>	Started

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

c. Interim Staff Evaluation

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

	<b>Interim Staff Evaluation Open Item</b>	<b>Status</b>
3.2.1.8.A	<p>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.</p> <p>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.</p>	Started
	<b>Interim Staff Evaluation Confirmatory Item</b>	<b>Status</b>
3.1.1.2.A	<p>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.</p>	Completed**
3.1.1.3.A	<p>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.</p>	Started

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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 temperatures - Confirm that the storage facilities will be designed for extreme temperature ranges including concerns for expansion of sheet metal, swollen door seals, etc.	Completed**
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**

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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**



**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Started

**ENCLOSURE  
MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

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.	Started
3.2.4.8.A	Electrical Power Sources - Confirm completion of Flex DG sizing calculation and appropriate actions.	Started
3.2.4.9.A	Portable Equipment Fuel - Confirm completion of evaluation and appropriate actions to assess long-term FLEX equipment fuel oil requirements.	Started
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.	Started
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

**ENCLOSURE**  
**MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

**7 Potential Interim Staff Evaluation Impacts**

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

# **ENCLOSURE**

## **MNS SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049)**

### **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