Exelon Generation

Order No. EA-13-109

RS-17-067

June 30, 2017

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

Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-63 and NPF-69
NRC Docket Nos. 50-220 and 50-410

Subject: Sixth Six-Month Status Report For Phases 1 and 2 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)

References:

1. NRC Order Number 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
2. NRC Interim Staff Guidance JLD-ISG-2013-02, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions", Revision 0, dated November 14, 2013
3. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions", Revision 0, dated April 2015
4. NEI 13-02, "Industry Guidance for Compliance With Order EA-13-109, BWR Mark I & II Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions", Revision 1, dated April 2015
5. Exelon Generation Company, LLC's Answer to June 6, 2013, Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated June 26, 2013
6. Exelon Generation Company, LLC Phase 1 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated June 27, 2014
7. Exelon Generation Company, LLC First Six-Month Status Report Phase 1 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated December 17, 2014 (FLL-14-035)
8. Exelon Generation Company, LLC Second Six-Month Status Report Phase 1 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated June 30, 2015 (RS-15-153)

9. Exelon Generation Company, LLC Phase 1 (Updated) and Phase 2 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated December 15, 2015 (RS-15-302)
10. Exelon Generation Company, LLC Fourth Six-Month Status Report For Phases 1 and 2 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated June 30, 2016 (RS-16-111)
11. Exelon Generation Company, LLC Fifth Six-Month Status Report For Phases 1 and 2 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated December 14, 2016 (RS-16-236)
12. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 1 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4481), dated March 26, 2015
13. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 2 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4482), dated February 11, 2015
14. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 1 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4481), dated August 30, 2016
15. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 2 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4482), dated August 25, 2016

On June 6, 2013, 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 require their BWRs with Mark I and Mark II containments to take certain actions to ensure that these facilities have a hardened containment vent system (HCVS) to remove decay heat from the containment, and maintain control of containment pressure within acceptable limits following events that result in loss of active containment heat removal capability while maintaining the capability to operate under severe accident (SA) conditions resulting from an Extended Loss of AC Power (ELAP). Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an Overall Integrated Plan (OIP) by June 30, 2014 for Phase 1 of the Order, and an OIP by December 31, 2015 for Phase 2 of the Order. The interim staff guidance (References 2 and 3) provide direction regarding the content of the OIP for Phase 1 and Phase 2. Reference 3 endorses industry guidance document NEI 13-02, Revision 1 (Reference 4) with clarifications and exceptions identified in References 2 and 3. Reference 5 provided the EGC initial response regarding reliable hardened containment vents capable of operation under severe accident conditions. Reference 6 provided the Nine Mile Point Nuclear

Station, Units 1 and 2, Phase 1 OIP pursuant to Section IV, Condition D.1 of Reference 1. References 7 and 8 provided the first and second six-month status reports pursuant to Section IV, Condition D.3 of Reference 1 for Nine Mile Point Nuclear Station. Reference 9 provided the Nine Mile Point Nuclear Station, Units 1 and 2, Phase 1 updated and Phase 2 OIP pursuant to Section IV, Conditions D.2 and D.3 of Reference 1. References 10 and 11 provided the fourth and fifth six-month status reports pursuant to Section IV, Condition D.3 of Reference 1 for Nine Mile Point Nuclear Station.

The purpose of this letter is to provide the sixth six-month update reports for Phases 1 and 2, pursuant to Section IV, Condition D.3 of Reference 1, that delineates progress made in implementing the requirements of Reference 1 for Nine Mile Point Nuclear Station, Units 1 and 2. The enclosed reports provide 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 reports also address the NRC Interim Staff Evaluation open items contained in References 12, 13, 14, and 15.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact David J. Distel at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of June 2017.

Respectfully submitted,

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

Enclosures:

1. Nine Mile Point Nuclear Station, Unit 1 Sixth Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

2. Nine Mile Point Nuclear Station, Unit 2 Sixth Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator - Region I
NRC Senior Resident Inspector - Nine Mile Point Nuclear Station
NRC Project Manager, NRR - Nine Mile Point Nuclear Station
Mr. Raj Auluck, NRR/JLD/TSD/JCBB, NRC
Mr. Brian E. Lee, NRR/JLD/JCBB, NRC
Mr. Jason C. Paige, NRR/JLD/JOMB, NRC

**Enclosure 1**

**Nine Mile Point Nuclear Station, Unit 1**
**Sixth Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions"**

**(13 Pages)**

## 1 Introduction

Nine Mile Point Unit 1 developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris, in response to Reference 2. This six month status report updates the milestone accomplishments based on the combined Phases 1 and 2 Overall Integrated Plan dated December 15, 2015 and last updated on December 14, 2016 (Reference 11).

Nine Mile Point Unit 1 developed an updated and combined Phases 1 and 2 Overall Integrated Plan (Reference 7 in Section 8), documenting:

1. The installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris, in response to Reference 2.
2. An alternative venting strategy that makes it unlikely that a drywell vent is needed to protect the containment from overpressure related failure under severe accident conditions, including those that involve a breach of the reactor vessel by molten core debris, in response to Reference 2

This enclosure provides an update of milestone accomplishments since submittal of the combined Phases 1 and 2 Overall Integrated Plan and the last six month update, 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 last six-month update was submitted under Reference 11, and are current as of June 1, 2017.

- Sixth Six-Month Update (complete with this submittal)
- Phase 1 Design, Installation and Functional Testing Complete

## 3 Milestone Schedule Status

The following provides an update to the Part 5 Milestone Schedule 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 revised Design Engineering Complete date shown below does not impact the order implementation date.

**NMP1 - Phase 1 Specific Milestone Schedule**

| Milestone | Target Completion Date | Activity Status | Comments |
|---|---|---|---|
| Hold preliminary/conceptual design meeting | November 2013 | Complete | |
| Submit Overall Integrated Implementation Plan | June 2014 | Complete | |
| Submit 6 Month Status Report | December 2014 | Complete | |
| Submit 6 Month Status Report | June 2015 | Complete | |
| Submit 6 Month Status Report | December 2015 | Complete | Simultaneous with Phase 2 OIP |
| Submit Combined Phase 1 & 2 Six-Month Status Report | June 2016 | Complete | |
| Design Engineering Complete | January 2017 | Complete | |
| Submit Combined Phase 1 & 2 Six-Month Status Report | December 2016 | Complete | |
| Submit Combined Phase 1 & 2 Six-Month Status Report | June 2017 | Complete with this submittal | |
| Maintenance and Operation Procedure Changes Developed, Training Complete | February 2017 | Complete | |
| Implementation Outage | April 2017 | Complete | |
| Procedure Changes Active, Walk-Through Demonstration/Functional Test | April 2017 | Complete | |
| Submit Completion Report | June 2019 | Not Started | |

**NMP1 - Phase 2 Specific Milestone Schedule**

| Milestone | Target Completion Date | Activity Status | Comments |
|---|---|---|---|
| Submit Overall Integrated Plan | December 2015 | Complete | Simultaneous with Phase 1 Updated OIP |
| Hold preliminary/conceptual design meeting | June 2015 | Complete | |
| Submit 6 Month Status Report | June 2016 | Complete | |
| Submit 6 Month Status Report | December 2016 | Complete | |
| Submit 6 Month Status Report | June 2017 | Complete with this submittal | |
| Submit 6 Month Status Report | December 2017 | Not Started | |
| Submit 6 Month Status Report | June 2018 | Not Started | |
| Submit 6 Month Status Report | December 2018 | Not Started | |
| Design Engineering Complete | April 2018 | Started | |
| Maintenance and Operation Procedure Changes Developed, Training Complete | February 2019 | Not Started | |
| Implementation Outage | April 2019 | Not Started | |
| Procedure Changes Active, Walk-Through Demonstration/Functional Test | April 2019 | Not Started | |
| Submit Completion Report | June 2019 | Not Started | |

## 4 Changes to Compliance Method

There are no changes to the compliance method as documented in the combined Phases 1 and 2 Overall Integrated Plan (Reference 7).

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

Nine Mile Point Unit 1 expects to comply with the order implementation date and no relief/relaxation is required at this time.

## 6 Open Items from Combined Phases 1 and 2 Overall Integrated Plan and Interim Staff Evaluations

The following tables provide a summary of the open items documented in Attachment 7 of the combined Phases 1 and 2 Overall Integrated Plan, the Reference 6 Interim Staff Evaluation (ISE) for Phase 1 and the Reference 10 ISE for Phase 2, and the status of each item. Phase 1 open item responses were discussed with the NRC on November 17, 2016, and all items were adequately addressed and resolved. All additional information has been provided, and the Phase 1 open items are considered closed based on NRC review.

| Open Item | Phase 1 Open Items from OIP | Status |
|---|---|---|
| 1 | Perform final sizing evaluation for HCVS batteries and battery charger and include in FLEX DG loading calculation. | Deleted (closed to ISE open item number 7 below) |
| 2 | Perform final vent capacity calculation for the Torus HCVS piping confirming 1 % minimum capacity. | Deleted (closed to ISE open item number 2 below) |
| 3 | Perform final sizing evaluation for pneumatic Nitrogen (N2) supply. | Deleted (closed to ISE open item number 8 below) |
| 4 | Perform confirmatory environmental condition evaluation for the Turbine Building in the vicinity of the Remote Operating Station (ROS) and HCVS dedicated pneumatic supply and batteries. | Deleted (closed to ISE open item numbers 6 and 11 below) |
| 5 | State which approach or combination of approaches the plant determines is necessary to address the control of combustible gases downstream of the HCVS control valve. | Deleted (closed to ISE open item number 3 below) |
| 6 | Complete evaluation for environmental/seismic qualification of HCVS components. | Deleted (closed to ISE open item numbers 9 and 11 below) |
| 7 | Complete evaluation for environmental conditions and confirm the travel path accessibility. | Deleted (closed to ISE open item number 6 below) |
| 8 | Perform radiological evaluation for Phase 1 vent line impact on ERO response actions. | Complete with this update.<br><br>Radiological Calculation H21C115 has |

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|---|---|---|
| | | been completed to provide assurance that personnel can safely operate the NMP1 HCVS and respond to required ERO response actions during severe accident conditions. Calculation was performed using NRC endorsed HCVS-WP-02 and HCVS-FAQ-12 methodologies. Calculation H21C115 has been posted in ePortal for NRC's review. |

| Open Item | ISE Phase 1 Open Items | Status |
|---|---|---|
| 1 | Make available for NRC staff audit the seismic and tornado missile final design criteria for the HCVS stack. | Submitted for Closure in Reference 9.<br>**June 2017 Update:**<br>The final revisions of the referenced pipe stress calculations have been added to the ePortal; however, there is no change to the closure summary provided in Reference 9. |
| 2 | Make available for NRC staff audit analyses demonstrating that HCVS has the capacity to vent the steam/energy equivalent of one percent of licensed/rated thermal power (unless a lower value is justified), and that the suppression pool and the HCVS together are able to absorb and reject decay heat, such that following a reactor shutdown from full power containment pressure is restored and then maintained below the primary containment design pressure and the primary containment pressure limit. | Submitted for Closure in Reference 9.<br>**June 2017 Update:**<br>The final revision of calculation S22.4-201.13F004 has been added to the ePortal; however, there is no change to the closure summary provided in Reference 9. |
| 3 | Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration. | Submitted for Closure in Reference 11.<br>**June 2017 Update:**<br>The final revision of calculation S22.4-201.13F001 has been added to the ePortal; however, there is no change to the closure summary provided in Reference 11. |
| 4 | Make available for NRC staff audit documentation that demonstrates adequate communication between | Submitted for Closure in Reference 9. |

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| | the remote HCVS operation locations and HCVS decision makers during ELAP and severe accident conditions. | |
| 5 | Provide a description of the strategies for hydrogen control that minimizes the potential for hydrogen gas migration and ingress into the reactor building or other buildings. | Submitted for Closure in Reference 9.<br>**June 2017 Update:**<br>The final revision of C18014C Sht. 7 has been added to the ePortal; however, there is no change to the closure summary provided in Reference 9. |
| 6 | Make available for NRC staff audit an evaluation of temperature and radiological conditions to ensure that operating personnel can safely access and operate controls and support equipment. | Submitted for Closure in Reference 11.<br>**June 2017 Update:**<br>The final revision of the HCVS Engineering Change Package Assessment of Operator Access section has been loaded on the ePortal; however, there is no change to the closure summary provided in Reference 11. |
| 7 | Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation. | Submitted for Closure in Reference 9. |
| 8 | Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location. | Submitted for Closure in Reference 9. |
| 10 | Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods. | Submitted for Closure in Reference 11.<br>**June 2017 Update:**<br>The final revision of the HCVS Engineering Change Package Instrumentation and Control description has been loaded on the ePortal; however, there is no change to the closure summary provided in Reference 11. |

The table below documents the status of the remaining open items and items considered complete with this submittal.

**Phase 1 ISE Open Items**

| Item Description | Closure Summary | Status |
|---|---|---|
| **ISE Phase 1 Open Item No. 9**<br>Make available for NRC staff audit documentation of a seismic qualification evaluation of HCVS components. | New components related to HCVS operation are required to be designed to operate following a seismic event. Most equipment came qualified or evaluated by the vendor. Some equipment was purchased as commercial grade (non-safety related) and was shake tested in order to prove the components' ability to withstand a bounding seismic event.<br>Qualification/evaluation documentation provided by the vendor, or test results from shake tests were compiled into a single report for HCVS dedicated equipment (Ref. VENRPT-15-000013) with the exception of separate seismic design report for the PCIVs and rupture disc. These reports are available in the ePortal for NRC review. | Complete with this submittal. |
| **ISE Phase 1 Open Item No. 11**<br>Make available for NRC staff audit the descriptions of local conditions (temperature, radiation and humidity) anticipated during ELAP and severe accident for the components (valves, instrumentation, sensors, transmitters, indicators, electronics, control devices, etc.) required for HCVS venting including confirmation that the components | The HCVS is located in the Reactor Building, Turbine Building, Auxiliary Control Room, and outside the Reactor Building. Environmental conditions and impacts are evaluated in detail in the Engineering Change Package (ECP). The ECP includes a listing of the components in each area along with the corresponding environmental conditions including temperature, radiation and humidity. The complete listing and information from the ECP is available on the ePortal for NRC review.<br>On November 17, 2016 a teleconference between Exelon and the NRC was held to review NMP2 Phase 1 closure of open items. In this call NMP clarified that consistent with NEI 13-02 Appendix C Section C.8.1, no further environmental qualification of existing containment parameter monitoring instrumentation is required if the instrumentation is already RG 1.97 qualified. | Complete with this submittal. |

| Item Description | Closure Summary | Status |
|---|---|---|
| are capable of performing their functions during ELAP and severe accident conditions. | | |

**Phase 2 OIP and ISE Open Items**

| Item Description | Closure Summary | Status |
|---|---|---|
| **Phase 2 OIP Item No. 1**<br>Perform radiological evaluation to determine the SAWA flow control point location. | Deleted (closed to ISE open item number 1 below) | Complete with this submittal. |
| **ISE Phase 2 Open Item No. 1**<br>Licensee to confirm through analysis the temperature and radiological conditions to ensure that operating personnel can safely access and operate controls and support equipment (ISE Section 3.3.2.1) | | Started |
| **ISE Phase 2 Open Item No. 2**<br>Licensee to evaluate the SAWA equipment and controls, as well as ingress | | Started |

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| and egress paths for the expected severe accident conditions (temperature, humidity, radiation) for the sustained operating period (ISE Section 3.3.2.3). | | |
| **ISE Phase 2 Open Item No. 3**<br>Licensee to demonstrate how instrumentation and equipment being used for SAWA and supporting equipment is capable to perform for the sustained operating period under the expected temperature and radiological conditions (ISE Section 3.3.2.3). | | Started |
| **ISE Phase 2 Open Item No. 4**<br>Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions (ISE Section 3.3.3). | The wetwell vent has been designed and installed to meet NEI 13-02 Rev 1 guidance, which will ensure that it is adequately sized to prevent containment overpressure under severe accident conditions.<br><br>The SAWM strategy will ensure that the wetwell vent remains functional for the period of sustained operation. Nine Mile Point Unit 1 will follow the guidance (flow rate and timing) for SAWA/SAWM described in BWROG-TP-15-008 and BWROG-TP-15-011. The wetwell vent will be opened prior to exceeding the PCPL value of 43 PSIG. Therefore, containment over pressurization is prevented without the need for | Complete with this submittal. |

<table>
<tr><td></td><td>a drywell vent.</td><td></td></tr>
<tr><td>ISE Phase 2 Open Item No. 5<br>Licensee to demonstrate how the plant is bounded by the reference plant analysis that shows the SAWM strategy is successful in making it unlikely that a drywell vent is needed (ISE Section 3.3.3.1).</td><td>
<table>
<tr><th>Reference Plant</th><th>Nine Mile Point U1</th></tr>
<tr><td>Torus freeboard volume is 525,000[1] gallons</td><td>Total freeboard volume is 862,288 gallons</td></tr>
<tr><td>SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours</td><td>SAWA flow is 263 GPM at 8 hours followed by 54 GPM* from 12 hours to 168 hours</td></tr>
</table>
NMP1 has performed a plant specific MAAP analysis to establish an initial SAWA flow rate using the above parameters of 263 GPM at 8 hours followed by 54 GPM* from 12 hours to 168 hours. The MAAP analysis demonstrates that the plant is bounded by the reference plant analysis and that the SAWM strategy is successful in making it unlikely that a drywell vent is needed to prevent containment failure (N1-MISC-004).<br>(*Note that 53 GPM was quoted in the OIP but NMP1 will use 54 GPM in its procedures consistent with the flowrate used in MAAP)<br>[1] Peach Bottom available freeboard volume in gallons is estimated from nominal water level of 14.7 feet to 21 feet. 21 feet is the upper range of the wide range torus level instrument and the assumed loss of wetwell vent function. The Peach Bottom torus is 31 feet in diameter.</td><td>Complete with this submittal.</td></tr>
<tr><td>ISE Phase 2 Open Item No. 6<br>Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX manual valve during severe</td><td>NMP1 utilizes the installed sound powered headset system and/or the 450 MHz radios in the talk around mode to communicate between the MCR and the SAWA flow control location. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remain powered using the same methods as evaluated under EA-12-049 for the period of sustained operation, which may be longer than identified for EA-12-049.</td><td>Complete with this submittal.</td></tr>
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| accident conditions (ISE Section 3.3.3.4). | | |
| **ISE Phase 2 Open Item No. 7** Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions (ISE Section 3.3.3.4). | | Started |

## 7 Interim Staff Evaluation (ISE) Impacts

There are no new ISE impacts that are in addition to those already described in the Fifth Six-Month status report. Refer to the Reference 11 Six-month status report for the previously described ISE impacts.

## 8 References

The following references support the updates to the combined Phases 1 and 2 Overall Integrated Plan described in this enclosure.

1. Nine Mile Point Unit 1's Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated June 27, 2014.
2. NRC Order Number EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" dated June 6, 2013.
3. NEI 13-02, "Industry Guidance for Compliance with NRC Order EA-13-109, 'To Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 1, dated April 2015.
4. NRC Interim Staff Guidance JLD-ISG-2013-02, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated November 2013 (Accession No. ML13304B836).
5. NRC Endorsement of industry "Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev 0" (Accession No. ML14128A219).

6. NRC Interim Staff Evaluation "Nine Mile Point Nuclear Station, Unit 1 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of the Order EA-13-109 (Severe Accident Capable Hardened Vents (TAC NO. MF4481)", dated March 26, 2015.
7. Nine Mile Point Unit 1's Combined Phases 1 and 2 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated December 15, 2015.
8. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated April 2015 (Accession No. ML15104A118).
9. Nine Mile Point's Fourth Six-Month Status Report Update for Phases 1 and 2 Overall Integrated Plan in Response to "June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated June 30, 2016.
10. NRC Interim Staff Evaluation "Nine Mile Point Nuclear Station, Unit 1 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of the Order EA-13-109 (Severe Accident Capable Hardened Vents (TAC NO. MF4481)", dated August 30, 2016.
11. Nine Mile Point's Fifth Six-Month Status Report Update for Phases 1 and 2 Overall Integrated Plan in Response to "June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated December 14, 2016 (RS-16-236).

**Enclosure 2**

**Nine Mile Point Nuclear Station, Unit 2**

**Sixth Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions**

**(9 pages)**

## 1 Introduction

Nine Mile Point Unit 2 developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris, in response to Reference 2. This six month status report updates the milestone accomplishments based on the combined Phases 1 and 2 Overall Integrated Plan dated December 15, 2015 and last updated on December 14, 2016 (Reference 12).

Nine Mile Point Unit 2 developed an updated and combined Phases 1 and 2 Overall Integrated Plan (Reference 7 in Section 8), documenting:

1. The installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability for pre-core damage and under severe accident conditions, including those involving a breach of the reactor vessel by molten core debris, in response to Reference 2.
2. An alternative venting strategy that makes it unlikely that a drywell vent is needed to protect the containment from overpressure related failure under severe accident conditions, including those that involve a breach of the reactor vessel by molten core debris, in response to Reference 2

This enclosure provides an update of milestone accomplishments since submittal of the combined Phases 1 and 2 Overall Integrated Plan and the last six month update, 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 last six-month update was submitted under Reference 12, and are current as of June 1, 2017.

- Sixth Six-Month Update (complete with this submittal)

## 3 Milestone Schedule Status

The following provides an update to the Part 5 Milestone Schedule 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.

**NMP2 - Phase 1 Specific Milestone Schedule**

| Milestone | Target Completion Date | Activity Status | Comments |
|---|---|---|---|
| Hold preliminary/conceptual design meeting | November 2013 | Complete | |
| Submit Overall Integrated Implementation | June 2014 | Complete | |

| | | | |
|---|---|---|---|
| Plan | | | |
| Submit 6 Month Status Report | December 2014 | Complete | |
| Design Engineering Complete | March 2015 | Complete | |
| Submit 6 Month Status Report | June 2015 | Complete | |
| Operations Procedure Changes Developed | December 2015 | Complete | |
| Submit 6 Month Status Report | December 2015 | Complete | Simultaneous with Phase 2 OIP |
| Training Complete | February 2016 | Complete | |
| NMP2 Implementation Outage | April 2016 | Complete | |
| Procedure Changes Active | April 2016 | Complete | |
| Walk Through Demonstration/Functional Test | April 2016 | Complete | |
| Submit Fourth 6-Month Status Report | June 2016 | Complete | |
| Submit Completion Report | June 2018 | Not Started | |

**NMP2 - Phase 2 Specific Milestone Schedule**

| Milestone | Target Completion Date | Activity Status | Comments |
|---|---|---|---|
| Submit Overall Integrated Implementation Plan | December 2015 | Complete | |
| Hold preliminary/conceptual design meeting | January 2016 | Complete | |
| Submit 6 Month Status Report | June 2016 | Complete | |
| Submit 6 Month Status Report | December 2016 | Complete | |
| Design Engineering On-site/Complete | September 2017 | Started | Changed from March 2017 |
| Submit 6 Month Status Report | June 2017 | Complete with this submittal | |
| Operations Procedure Changes Developed | December 2017 | Not Started | |

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|---|---|---|---|
| Site Specific Maintenance Procedure Developed | December 2017 | Not Started | |
| Submit 6 Month Status Report | December 2017 | Not Started | |
| Training Complete | February 2018 | Not Started | |
| Implementation Outage | April 2018 | Not Started | |
| Procedure Changes Active | April 2018 | Not Started | |
| Walk Through Demonstration/Functional Test | April 2018 | Not Started | |
| Submit Completion Report | June 2018 | Not Started | |

## 4 Changes to Compliance Method

There are no changes to the compliance method as documented in the combined Phases 1 and 2 Overall Integrated Plan (Reference 7).

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

Nine Mile Point Unit 2 complied with the Phase 1 order implementation date and expects to comply with the Phase 2 order implementation date and no relief/relaxation is required at this time.

## 6 Open Items from Combined Phases 1 and 2 Overall Integrated Plan and Interim Staff Evaluations

The following tables provide a summary of the open items documented in the combined Phases 1 and 2 Overall Integrated Plan, the Reference 6 Interim Staff Evaluation (ISE) for Phase 1, and the Reference 11 ISE for Phase 2 and the status of each item. Phase 1 open item responses were discussed with the NRC on November 17, 2016, and all items were adequately addressed and resolved. All additional information has been provided, and the Phase 1 open items are considered closed based on NRC review.

| Phase 1 Open Items from OIP | Status |
|---|---|
| OIP Phase 1 Open Item No. 1 | Deleted (closed to ISE open item number 8 below) |
| OIP Phase 1 Open Item No. 2 | Deleted (closed to ISE open item number 3 below) |
| OIP Phase 1 Open Item No. 3 | Deleted (closed to ISE open item number 9 below) |

| | |
|---|---|
| OIP Phase 1 Open Item No. 4 | Deleted (closed to ISE open item number 2 below) |
| OIP Phase 1 Open Item No. 5 | Deleted (closed to ISE open item number 4 below) |
| OIP Phase 1 Open Item No. 6 | Deleted (closed to ISE open item numbers 10 and 12 below) |
| OIP Phase 1 Open Item No. 7 | Deleted (closed to ISE open item number 7 below) |
| OIP Phase 1 Open Item No. 8 | Deleted (closed to ISE open item number 7 below) |
| OIP Phase 1 Open Item No. 9 | Submitted for closure in Reference 10 |

| ISE Phase 1 Open Items | Status |
|---|---|
| ISE Phase 1 Open Item No. 1 | Submitted for closure in Reference 10 |
| ISE Phase 1 Open Item No. 2 | Submitted for Closure in Reference 7 |
| ISE Phase 1 Open Item No. 3 | Submitted for closure in Reference 10 |
| ISE Phase 1 Open Item No. 4 | Submitted for Closure in Reference 7.<br>**June 2017 Update:**<br>A minor revision to calculation A10.1-P-053 has been added to the ePortal; however, there is no change to the closure summary provided in Reference 7. |
| ISE Phase 1 Open Item No. 5 | Submitted for closure in Reference 10 |
| ISE Phase 1 Open Item No. 6 | Submitted for Closure in Reference 7 |
| ISE Phase 1 Open Item No. 7 | Submitted for closure in Reference 10 |
| ISE Phase 1 Open Item No. 8 | Submitted for closure in Reference 10 |
| ISE Phase 1 Open Item No. 9 | Submitted for Closure in |

| | |
|---|---|
| | Reference 7 |
| ISE Phase 1 Open Item No. 10 | Submitted for closure in Reference 10.<br>**June 2017 Update:** A final revision of VENRPT-15-000013 and the seismic reports for PCIVs have been uploaded to ePortal; however, there is no change to the closure summary provided in Reference 10. |
| ISE Phase 1 Open Item No. 11 | Submitted for closure in Reference 10 and updated in Reference 12. |
| ISE Phase 1 Open Item No. 12 | Submitted for closure in Reference 10. |
| ISE Phase 1 Open Item No. 13 | Submitted for closure in Reference 10 |

The table below documents the status of the remaining open items and items considered complete with this submittal.

**Phase 2 OIP and ISE Open Items**

<table>
<tr><th>Item Description</th><th>Closure Summary</th><th>Status</th></tr>
<tr><td>OIP Phase 2 Open Item No. 1<br>Perform radiological evaluation to determine feasibility of reactor building actions.</td><td></td><td>Started</td></tr>
<tr><td>ISE Phase 2 Open Item No. 1<br>Licensee to provide the site-specific MAAP evaluation that establishes the initial SAWA flow rate (ISE Section</td><td><table><tr><td>Reference Plant</td><td>Nine Mile Point U2</td></tr><tr><td>Torus freeboard volume is 525,000[1] gallons</td><td>Total freeboard volume is 782,000 gallons</td></tr><tr><td>SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours</td><td>SAWA flow is 300 GPM at 8 hours followed by 100 GPM from 14 hours to 168 hours</td></tr></table></td><td>Complete with this submittal.</td></tr>
</table>

| | | |
|---|---|---|
| 3.3.2.2) | NMP2 has performed a plant specific MAAP analysis to establish an initial SAWA flow rate using the above parameters of 300 GPM at 8 hours followed by 100 GPM from 14 hours to 168 hours. The MAAP analysis demonstrates that the plant is bounded by the reference plant analysis and that the SAWM strategy is successful in making it unlikely that a drywell vent is needed to prevent containment failure (N2-MISC-003 Rev 2). The MAAP analysis is loaded on the ePortal for NRC review.<br>[1] Peach Bottom available freeboard volume in gallons is estimated from nominal water level of 14.7 feet to 21 feet. 21 feet is the upper range of the wide range torus level instrument and the assumed loss of wetwell vent function. The Peach Bottom torus is 31 feet in diameter. | |
| **ISE Phase 2 Open Item No. 2**<br>Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions (ISE Section 3.3.3). | The wetwell vent has been designed and installed to meet NEI 13-02 Rev 1 guidance, which will ensure that it is adequately sized to prevent containment overpressure under severe accident conditions.<br>The SAWM strategy will ensure that the wetwell vent remains functional for the period of sustained operation. Nine Mile Point Unit 2 will follow the guidance (flow rate and timing) for SAWA/SAWM described in BWROG-TP-15-008 and BWROG-TP-15-011. The wetwell vent will be opened prior to exceeding the PCPL value of 45 PSIG. Therefore, containment over pressurization is prevented without the need for a drywell vent. | Complete with this submittal. |
| **ISE Phase 2 Open Item No. 3**<br>Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX manual valve during severe accident | NMP2 utilizes the installed sound powered headset system and/or the 450 MHz radios in the talk around mode to communicate between the MCR and the SAWA flow control location. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remain powered using the same methods as evaluated under EA-12-049 for the period of sustained operation, which may be longer than identified for EA-12-049. | Complete with this submittal. |

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|---|---|---|
| conditions (ISE Section 3.3.3.4). | | |
| **ISE Phase 2 Open Item No. 4**<br>Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions (ISE Section 3.3.3.4). | | Started |

## 7 Interim Staff Evaluation Impacts

There are no new ISE impacts that are in addition to those already described in the Fifth Six-Month status report. Refer to the Reference 12 Six-month status report for the previously described ISE impacts.

## 8 References

The following references support the updates to the combined Phases 1 and 2 Overall Integrated Plan described in this enclosure.

1. Nine Mile Point Unit 2's Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated June 27, 2014.
2. NRC Order Number EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" dated June 6, 2013.
3. NEI 13-02, "Industry Guidance for Compliance with NRC Order EA-13-109, 'To Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 1, dated April 2015.
4. NRC Interim Staff Guidance JLD-ISG-2013-02, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated November 2013 (Accession No. ML13304B836).
5. NRC Endorsement of industry "Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev 0" (Accession No. ML14128A219).

6. NRC Interim Staff Evaluation "Nine Mile Point Nuclear Station, Unit 2 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of the Order EA-13-109 (Severe Accident Capable Hardened Vents (TAC NO. MF4482)", dated February 11, 2015.
7. Nine Mile Point Unit 2's Combined Phase 1 and 2 Overall Integrated Plan in Response to "June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated December 15, 2015.
8. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Revision 0, dated April 2015 (Accession No. ML15104A118).
9. Letter from M.G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events, dated February 28, 2013.
10. Nine Mile Point's Fourth Six-Month Status Report Update for Phases 1 and 2 Overall Integrated Plan in Response to "June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated June 30, 2016.
11. NRC Interim Staff Evaluation "Nine Mile Point Nuclear Station, Unit 2 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of the Order EA-13-109 (Severe Accident Capable Hardened Vents (TAC NO. MF4482)", dated August 25, 2016.
12. Nine Mile Point's Fifth Six-Month Status Report Update for Phases 1 and 2 Overall Integrated Plan in Response to "June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated December 14, 2016 (RS-16-236).