



Order No. EA-13-109

RS-17-154
NMP1L3186

December 15, 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: Seventh 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
16. Exelon Generation Company, LLC 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), dated June 30, 2017 (RS-17-067)
17. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 2 – Report for the Audit of Licensee Responses to Interim Staff Evaluation Open Items Related to NRC Order EA-13-109 to Modify License with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4482; EPID L-2014-JLD-004), dated October 17, 2017
18. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 1 – Report for the Audit of Licensee Responses to Interim Staff Evaluations Open Items Related to NRC Order EA-13-109 to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4481; EPID L-2014-JLD-0043), dated October 30, 2017

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.

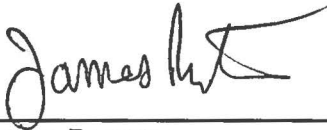
Reference 1 required submission of an Overall Integrated Plan (OIP) by June 30, 2014 for Phase 1 of the Order, and an OIP by December 31, 2015 for Phase 2 of the Order. The interim staff guidance (References 2 and 3) provide direction regarding the content of the OIP for Phase 1 and Phase 2. Reference 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, 11 and 16 provided the fourth, fifth and sixth six-month status reports respectively, 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 seventh 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 remaining NRC Interim Staff Evaluation open items contained in Reference 16. Responses to the remaining open items were previously uploaded to the NRC ePortal to support the Phase 2 NRC audit teleconference calls for Nine Mile Point Nuclear Station Unit 1 on September 28, 2017 and Nine Mile Point Nuclear Station Unit 2 on October 12, 2017. Closure of the open items is documented in the References 17 and 18 NRC audit reports.

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 15th day of December 2017.

Respectfully submitted,



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

Enclosures:

1. Nine Mile Point Nuclear Station, Unit 1 Seventh 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 Seventh 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

**Seventh 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"**

(18 Pages)

Nine Mile Point Nuclear Station, Unit 1
Seventh Six-Month Status Report for Implementation of HCVS Phases 1 and 2

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 June 30, 2017 (Reference 12).

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 the last six-month update was submitted under Reference 12, and are current as of December 1, 2017.

- Phase 2 Design Engineering Complete
- Seventh Six-Month Update (complete with this submittal)

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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	
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	

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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	
Submit 6 Month Status Report	December 2017	Complete with this submittal	
Submit 6 Month Status Report	June 2018	Not Started	
Submit 6 Month Status Report	December 2018	Not Started	
Design Engineering Complete	April 2018	Complete	
Maintenance and Operation Procedure Changes Developed, Training Complete	February 2019	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.

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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.

Phase 2 open item responses were discussed with the NRC on October 12, 2017, and all items were adequately addressed and resolved. All additional information has been provided, and the Phases 1 and 2 open items are considered closed based on the Reference 13 NRC audit report.

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)

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8	Perform radiological evaluation for Phase 1 vent line impact on ERO response actions.	Submitted for Closure in Reference 12.
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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 References 9 and 12.
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 References 9 and 12.
3	Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration.	Submitted for Closure in References 11 and 12.
4	Make available for NRC staff audit documentation that demonstrates adequate communication between the remote HCVS operation locations and HCVS decision makers during ELAP and severe accident conditions.	Submitted for Closure in Reference 9.
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 References 9 and 12.
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 References 11 and 12.
7	Make available for NRC staff audit the final sizing evaluation for HCVS	Submitted for Closure in Reference 9.

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	batteries/battery charger including incorporation into FLEX DG loading calculation.	<p>December 2017 Update:</p> <p>The Hardened Containment Vent System (HCVS) Phase 1 Engineering Change Package (ECP) assumed a low ambient temperature in the Turbine Building of 60F during an extended loss of AC power (ELAP) occurring with extreme outdoor cold weather conditions. Contrary to the Phase 1 assumption, the HCVS Phase 2 ECP assumed a low ambient temperature of 43F during an ELAP based on calculation S10HVACHV11. Use of the lower ambient temperature is conservative and is supported by Calculation S10HVACHV11. The impact of applying a 43F ambient temperature to the HCVS design is negligible and does not adversely impact system function. The 60F ambient temperature was only used in the HCVS Battery Sizing Evaluation contained in the ECP Design Consideration Summary (DCS) Attachment M. The ambient temperature is used to determine the temperature correction factor which lowers the available battery capacity at lower temperatures. Using the lower ambient temperature increases the minimum required ampere-hours (AH) battery capacity from 55 AH to 65 AH. The selected battery capacity of 104 AH remains well above the minimum required of 65 AH. This change was documented in Nine Mile Point Issue Report (IR) 04059544 and was previously loaded on the ePortal in the folder entitled "NMP-1 HCVS ISE Open Item</p>
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		Completion Reference Documents".
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.
9	Make available for NRC staff audit documentation of a seismic qualification evaluation of HCVS components.	Submitted for Closure in Reference 12.
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 References 11 and 12.
11	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 are capable of performing their functions during ELAP and severe accident conditions.	Submitted for Closure in Reference 12.

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The table below documents the status of the Phase 2 OIP and ISE Open Items which are now closed as indicated in the Status column below.

Phase 2 OIP and ISE Open Items

Item Description	Closure Summary	Status
Phase 2 OIP Item No. 1 Perform radiological evaluation to determine the SAWA flow control point location.	Deleted (closed to ISE open item number 1 below)	Closed
ISE Phase 2 Open Item No. 1 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)	Refer to the closure summary for ISE Phase 2 Open Item No. 2.	Complete with this submittal. Closed by Reference 13.
ISE Phase 2 Open Item No. 2 Licensee to evaluate the SAWA	Equipment and Controls Plant instrumentation for Severe Accident Water Addition/Severe Accident Water Management (SAWA/SAWM) that is qualified to RG 1.97 or equivalent is considered qualified for the sustained	Complete with this submittal. Closed by Reference 13.

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<p>equipment and controls, as well as ingress and egress paths for the expected severe accident conditions (temperature, humidity, radiation) for the sustained operating period (ISE Section 3.3.2.3).</p>	<p>operating period without further evaluation. The following plant instruments are qualified to RG 1.97:</p> <p>Wetwell Water Level: PT-201.2-594, PT-201.2-680, LI-201.2-594C Wetwell Water Level: PT-201.2-595, PT-201.2-596, LI-201.2-595D Wetwell Pressure: PT-201.2-595, PI-201.2-595A Wetwell Pressure: PT-201.2-594, PI-201.2-594A</p> <p>The following drywell pressure instruments are also qualified to RG 1.97 and are available but not credited:</p> <p>PI-201.2-483A, PT-201.2-483 – Drywell Pressure PI-201.2-484A, PT-201.2-484 – Drywell Pressure</p> <p>Passive components that do not need to change state after initially establishing SAWA flow do not require evaluation beyond the first 8 hours, at which time they are expected to be installed and ready for use to support SAWA/SAWM. Also, the fire hoses used are the “Big 10” model from Key hose. This hose is a heavy duty double jacketed hose using both polyurethane and EPDM rubber. Per HCVS-OGP-009 these materials will withstand the maximum doses that can be experienced during a severe accident and are therefore acceptable.</p> <p>The following additional equipment performing an active SAWA/SAWM function is considered:</p> <ul style="list-style-type: none"> • SAWA/SAWM flow instrument. • SAWA/SAWM pump • SAWA/SAWM generator • Active valves in SAWA flow path (Not applicable as there are no active valves in the SAWA flow path) <p>The above listed additional SAWA/SAWM equipment performing an active function was evaluated for radiation and temperature/humidity as described below:</p>	
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SAWA/SAWM flow instrument:

The SAWA flow instrument will be mounted on a cart with a throttling valve and stored in the FLEX Storage Building. During FLEX/SAWA flow injection to the RPV, the cart will be moved into the turbine building near the HCVS Remote Operating Station (ROS). A quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 and found the dose rates at the flow instrument are acceptable. Refer to calculation H21C115 loaded in the ePortal. The dose rate at the operating location of the flow meter cart (just west of the ROS, between column rows G and H) is 2.25E-05 rem/hr (Ref. Calculation H21C115, Attachment C, Page C3). The area just east of the ROS may be acceptable as well as long as an Operator does not stay at the flow meter for an extended period of time as the dose rate east of the ROS increases to 7.335E-01 rem/hr per H21C115 Page C3. Using the higher dose rate, the total dose over the 7-day period is 123 rem. This dose is well below the generally accepted maximum for digital equipment, 1000 rem (Ref. EPRI 1009659, Generic Qualification and Dedication of Digital Components, March 2005, Page 6-2, second paragraph). The flow meter is commercial equipment and does not have a published radiation dose limit.

The selected instrument is designed for the expected flow rate, temperature and pressure for SAWA over the period of sustained operation.

SAWA Flow Instrument Qualification	Expected SAWA Parameter Range
~2 to 544 GPM	54 to 263 GPM
-4 to 140 °F	43 to 98 °F
740 PSI MAX	365 PSI MAX

The above flow instrument information is taken from vendor manual N0B03500INDREC001 pages 44 and 45 for the 2.5-inch Badger Meter ModMAG M5000 flowmeter with 300# flanges specified for this application. The above ambient temperature range is based on calculation S10HVACHV11, Area TR shown on Figure 2 Page A-6 with the results from page 17 for

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	<p>Area TR. The maximum pressure of 365 psi is the FLEX pump shutoff head at maximum pump speed.</p> <p>SAWA/SAWM Pump:</p> <p>The SAWA pump is the FLEX pump and the location remains as was previously evaluated for the FLEX location. The 7-day dose from the U1 HCVS vent pipe when crediting shielding provided by the screenhouse walls and traffic barriers is reported on page 93 of calculation H21C115 to be 51.3 rem. The dose from the U2 HCVS vent pipe is not added because per HCVS FAQ 10, it is not required to assume severe accident conditions at each unit on a dual unit site. The 7-day dose is acceptable per the same basis provided above for the flow meter. The SAWA pump would be exposed to the same high and low outdoor ambient temperature conditions addressed under FLEX.</p> <p>SAWA/SAWM generator:</p> <p>The SAWA generator is the FLEX generator and the location remains as was previously evaluated for the FLEX location. The 7-day dose from the U1 HCVS vent pipe is 23.5 rem as reported on page 93 of calculation H21C115. The dose from the U2 HCVS vent pipe is not added because per HCVS FAQ 10, it is not required to assume severe accident conditions at each unit on a dual unit site. The 7-day dose is acceptable per the same basis provided above for the flow meter. The SAWA generator would be exposed to the same high and low outdoor ambient temperature conditions addressed under FLEX.</p> <p>Ingress and Egress</p> <p>Actions taken within the first hour (prior to start of core damage) from the start of the ELAP are acceptable from an environmental and radiological perspective without further evaluation.</p> <p>Actions performed within the MCR are acceptable for the entire period of Sustained Operation per HCVS-FAQ-06 Assumption 049-21.</p>	
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	<p>A quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 and found the dose rates at deployment locations for the SAWA throttle valve and flow meter cart including ingress and egress paths are acceptable. SAWA flow will be throttled using the throttle valve on the cart. The cart will be deployed adjacent to the ROS in the turbine building. Therefore, the evaluations in calculation H21C115 for Operator travel paths and for operating the HCVS ROS controls would also apply to operating the throttle valve and flow meter cart.</p> <p>There are no Operator actions required in the reactor building to inject SAWA flow to the RPV. While there are no specific Operator actions in the reactor building required for SAWA flow injection, change notice ECP-17-000279 HC1C115 was performed to assess Operator actions in the event that Operators decide to enter the reactor building prior to venting for other reasons, which may expose them to radiation shine from containment structures. Attachment I in the change notice assesses dose rates to operators in the event they decide to enter the reactor building during Phase 2 venting and provides insights as to areas to avoid. The assessment performed resulted in dose rates from containment sources to dose points presented in HC1C115 Attachment J that would not prevent the operators from accessing the areas to perform SAWA actions during the first 7 hours post-ELAP.</p> <p>High and low ambient temperatures in the turbine building area TR per S10HVACHV11 during the 7-day period are below maximum personnel habitability temperatures and will not prevent Operators from performing required actions to operate the HCVS/SAWA equipment.</p> <p>Calculation H21C115 Table 9.1 also provides maximum stay times over 7 days for Operators at the SAWA pump and diesel generator.</p> <p>Cautions will be added to procedures to provide guidance for high dose rate areas to minimize dose.</p>	
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	<p>The following documents have been loaded into the ePortal to support the above evaluations:</p> <ul style="list-style-type: none"> • Calculation H21C115, "HCVS Radiological Dose Analysis" • Change Notice # ECP-17-00279-CN-001 H21C115 • Vendor Manual N0B03500INDREC001, "M-Series Electromagnetic Flow Meter" • EPRI 1009659, Generic Qualification and Dedication of Digital Components, March 2005 • Calculation S10HVACHV11 ""Turbine Building Maximum and Minimum Temperature" • HCVS FAQ 10 – Severe Accident Response Multiple Unit Site • HCVS-OGP-009 – HCVS Hose Radiological Evaluation 	
<p>ISE Phase 2 Open Item No. 3</p> <p>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).</p>	<p>Refer to the closure summary for ISE Phase 2 Open Item No. 2.</p>	<p>Complete with this submittal. Closed by Reference 13.</p>
<p>ISE Phase 2 Open Item No. 4</p>	<p>The wetwell vent has been designed and installed to meet NEI 13-02 Rev 1 guidance, which will ensure</p>	<p>Submitted for closure in</p>

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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).	that it is adequately sized to prevent containment overpressure under severe accident conditions. 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 a drywell vent.		Reference 12. Closed by Reference 13.					
ISE Phase 2 Open Item No. 5 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).	<table><tr><th>Reference Plant</th><th>Nine Mile Point U1</th></tr><tr><td>Torus freeboard volume is 525,000¹ 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). (*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) 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.	Reference Plant	Nine Mile Point U1	Torus freeboard volume is 525,000 ¹ gallons	Total freeboard volume is 862,288 gallons	SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours	SAWA flow is 263 GPM at 8 hours followed by 54 GPM* from 12 hours to 168 hours	Submitted for closure in Reference 12. Closed by Reference 13.
Reference Plant	Nine Mile Point U1							
Torus freeboard volume is 525,000 ¹ gallons	Total freeboard volume is 862,288 gallons							
SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours	SAWA flow is 263 GPM at 8 hours followed by 54 GPM* from 12 hours to 168 hours							

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<p>ISE Phase 2 Open Item No. 6</p> <p>Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX manual valve during severe accident conditions (ISE Section 3.3.3.4).</p>	<p>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.</p>	<p>Submitted for closure in Reference 12. Closed by Reference 13.</p>
<p>ISE Phase 2 Open Item No. 7</p> <p>Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions (ISE Section 3.3.3.4).</p>	<p>Refer to the closure summary for ISE Phase 2 Open Item No. 2.</p>	<p>Complete with this submittal. Closed by Reference 13.</p>

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.

Nine Mile Point Nuclear Station, Unit 1
Seventh Six-Month Status Report for Implementation of HCVS Phases 1 and 2

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.

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Seventh Six-Month Status Report for Implementation of HCVS Phases 1 and 2

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).
12. Exelon Generation Company, LLC 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), dated June 30, 2017 (RS-17-067).
13. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 1 – Report for the Audit of Licensee Responses to Interim Staff Evaluations Open Items Related to NRC Order EA-13-109 to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4481; EPID L-2014-JLD-0043), dated October 30, 2017.

Enclosure 2

Nine Mile Point Nuclear Station, Unit 2

Seventh 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

(11 pages)

Nine Mile Point Nuclear Station, Unit 2
Seventh Six-Month Status Report for Implementation of HCVS Phases 1 and 2

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 June 30, 2017 (Reference 13).

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 13, and are current as of December 1, 2017.

- Phase 2 Design Engineering On-site/Complete
- Seventh 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	

Nine Mile Point Nuclear Station, Unit 2
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Submit Overall Integrated Implementation Plan	June 2014	Complete	
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	Complete	Changed from March 2017
Submit 6 Month Status Report	June 2017	Complete	
Operations and Maintenance Procedure Changes Developed	December 2017	Started	

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Submit 6 Month Status Report	December 2017	Complete with this submittal	
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 2 open item responses were discussed with the NRC on September 28, 2017, and all items were adequately addressed and resolved. All additional information has been provided, and the Phases 1 and 2 open items are considered closed based on the Reference 14 NRC audit report.

Nine Mile Point Nuclear Station, Unit 2
Seventh Six-Month Status Report for Implementation of HCVS Phases 1 and 2

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 and updated in Reference 13.
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

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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 and updated in Reference 13.
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 Phase 2 OIP and ISE Open Items which are now closed as indicated in the Status column below.

Phase 2 OIP and ISE Open Items

Item Description	Closure Summary	Status
OIP Phase 2 Open Item No. 1 Perform radiological evaluation to determine feasibility of reactor building actions.	Radiological Calculation H21C-114 was previously posted on the ePortal in response to OIP Phase 1 Open Item No. 9. The calculation performed a dose assessment caused by sustained operation of the HCVS under beyond design basis severe accident conditions for 7 days post-ELAP. Calculation Change Notice ECP-17-000280-CN-001 H21C-114 is a minor revision to the parent calculation to further assess the dose rate to operators performing SAWA actions in the reactor building considering dose from containment penetrations. Attachment E in the reference change notice provides this supplemental dose assessment. Attachment E concludes that Operators can perform all preliminary actions in the reactor building within the first 7 hours post-ELAP to set up the SAWA equipment and then operate the SAWA equipment for 7-days post-ELAP, considering the dose from the HCVS and from containment shine through penetrations, without exceeding a total dose of 5 R. Calculation Change Notice ECP-17-000280-CN-001 H21C-114 has been loaded onto the NRC ePortal.	Complete with this submittal. Closed by Reference 14.

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<p>ISE Phase 2 Open Item No. 1</p> <p>Licensee to provide the site-specific MAAP evaluation that establishes the initial SAWA flow rate (ISE Section 3.3.2.2)</p>	<table><tr><th>Reference Plant</th><th>Nine Mile Point U2</th></tr><tr><td>Torus freeboard volume is 525,000¹ 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> <p>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.</p> <p>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.</p>	Reference Plant	Nine Mile Point U2	Torus freeboard volume is 525,000 ¹ gallons	Total freeboard volume is 782,000 gallons	SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours	SAWA flow is 300 GPM at 8 hours followed by 100 GPM from 14 hours to 168 hours	<p>Submitted for closure in Reference 13. Closed by Reference 14.</p>
Reference Plant	Nine Mile Point U2							
Torus freeboard volume is 525,000 ¹ gallons	Total freeboard volume is 782,000 gallons							
SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours	SAWA flow is 300 GPM at 8 hours followed by 100 GPM from 14 hours to 168 hours							
<p>ISE Phase 2 Open Item No. 2</p> <p>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).</p>	<p>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.</p> <p>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.</p>	<p>Submitted for closure in Reference 13. Closed by Reference 14.</p>						

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<p>ISE Phase 2 Open Item No. 3</p> <p>Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX manual valve during severe accident conditions (ISE Section 3.3.3.4).</p>	<p>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.</p>	<p>Submitted for closure in Reference 13. Closed by Reference 14.</p>
<p>ISE Phase 2 Open Item No. 4</p> <p>Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions (ISE Section 3.3.3.4).</p>	<p>The SAWA flow instrument will be mounted on the FLEX valve manifold cart and stored in the reactor building just outside of the inner door to the reactor building track bay. During FLEX/SAWA flow injection to the RPV the cart will be moved into the RB track bay adjacent to the HCVS Remote Operating Station (ROS). A quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 and found the dose rates at the ROS including ingress/egress paths are acceptable (Ref: Calculation H21C-114 as amended by ECP-17-00280-CN-001 H21C-114). The dose rate at the operating location of the flow meter cart (inside the Reactor Building track bay) is < 5E-3 rem/hr (see H21C-114, Table 8.1-1 on page 67). The total dose over the 7-day period is less than 1 rem, which is well below the generally accepted maximum for digital equipment, 1000 rem. The flow meter is commercial equipment and does not have a published radiation dose limit. ECP-17-00280-CN-001 H21C-114 is loaded in the NRC ePortal.</p> <p>The selected instrument is designed for the expected flow rate, temperature and pressure for SAWA over the period of sustained operation.</p>	<p>Complete with this submittal. Closed by Reference 14.</p>

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SAWA Flow Instrument Qualification	Expected SAWA Parameter Range
~2 to 544 GPM	100 to 300 GPM
-4 to 140 °F	50 to 120 °F
740 PSI MAX	365 PSI MAX

The above flow instrument information is taken from vendor manual N0B03500INDREC001, "M-Series Electromagnetic Flow Meter, pages 44 and 45 loaded in the NRC ePortal for the 2.5-inch Badger Meter ModMAG M5000 flowmeter with 300# flanges specified for this application. The above ambient temperature range is based on information in the HCVS Phase 1 ECP-13-00087, previously uploaded to the ePortal in response to ISE Phase 1 Open Item 11. The maximum pressure of 365 psi is the FLEX pump shutoff head at maximum pump speed.

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).

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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).
13. Exelon Generation Company, LLC 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), dated June 30, 2017 (RS-17-067).

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14. NRC letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Unit 2 – Report for the Audit of Licensee Responses to Interim Staff Evaluation Open Items Related to NRC Order EA-13-109 to Modify License with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4482; EPID L-2014-JLD-004), dated October 17, 2017.