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June 14, 2017

L-MT-17-042
10 CFR 2.202
EA-13-109

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

Monticello Nuclear Generating Plant
Docket No. 50-263
Renewed Facility Operating License No. DPR-22

Monticello Nuclear Generating Plant: Sixth Six-Month Status Report 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 EA-13-109), Phases 1 and 2 (TAC No. MF4376)

References:

1) 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. (ADAMS Accession No. ML13143A334)
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. (ADAMS Accession No. ML13304B836)
3) Letter from D. Skeen (NRC) to J. Pollock (NEI), Endorsement of Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev 0, dated May 14, 2014. (ADAMS Accession No. ML14128A219)
4) NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 0, dated November 2013. (ADAMS Accession No. ML13316A853)
5) Letter from K. Fili (NSPM) to Document Control Desk (NRC), "MNGP's 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)," L-MT-14-052, dated June 30, 2014. (ADAMS Accession No. ML14183A412).

6) Letter from K. Fili (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: First Six-Month Status Report 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)," L-MT-14-092, dated December 16, 2014. (ADAMS Accession No. ML14353A215)
7) Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: Second Six-Month Status Report 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), Phase 1," L-MT-15-031, dated June 22, 2015. (ADAMS Accession No. ML15173A176)
8) NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 1, dated April 2015. (ADAMS Accession No. ML15113B318)
9) 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. (ADAMS Accession No. ML15104A118)
10) Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant's 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) including Phase 1 Status Report," L-MT-15-090, dated December 17, 2015. (ADAMS Accession No. ML15356A120)
11) Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: Fourth Six-Month Status Report 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), Phases 1 and 2," L-MT-16-034, dated June 17, 2016. (ADAMS Accession No. ML16169A309)
12) Letter from M. Halter (NRC) to P. Gardner (NSPM), "Subject: Monticello Nuclear Generating Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase One of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4376),"dated April 2, 2015. (ADAMS Accession No. ML15082A167)

13) Letter from J. Quichocho (NRC) to P. Gardner (NSPM), “Subject: Monticello Nuclear Generating Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (CAC No. MF4376),”dated September 6, 2016. (ADAMS Accession No. ML16244A120)
14) Letter from P. Gardner (NSPM) to Document Control Desk (NRC), “Monticello Nuclear Generating Plant: Fifth Six-Month Status Report 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), Phases 1 and 2,” L-MT-16-072, dated December 19, 2016. (ADAMS Accession No. ML16354A666)

On June 6, 2013, the Nuclear Regulatory Commission (NRC) issued Order EA-13-109 (Reference 1) to Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy. Reference 1 was effective immediately and directs NSPM to install 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, for Monticello Nuclear Generating Plant (MNGP). Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of a Phase 1 Overall Integrated Plan (OIP) pursuant to Section IV, Condition D. References 2 and 3 endorse industry guidance document, NEI 13-02, Revision 0 (Reference 4) with clarifications and exceptions. Reference 5 provided the MNGP Phase 1 OIP.

Reference 1 requires submission of a status report at six-month intervals following submittal of the Phase 1 OIP. References 2 and 4 provide direction regarding the content of the status reports. References 6 and 7 provided the first and second six-month status reports for Phase 1 of the order.

In Reference 9, the NRC endorsed industry guidance document NEI 13-02, Revision 1 (Reference 8) with clarifications and exceptions identified in Reference 9. NEI 13-02, Revision 1 provides guidance for implementing Phase 2 of Order EA-13-109. Reference 10 provided a combined Phase 1 and 2 OIP and provided an updated status of Phase 1 of the order. Reference 11 provided the fourth status report which included both Phase 1 and Phase 2 status updates. In References 12 and 13, the NRC provided interim staff evaluations (ISEs) for HCVS Order Phase 1 and 2 OIPs, respectively. In Reference 14, NSPM provided the fifth HCVS Order status report.

The purpose of this letter is to provide the sixth six-month status report pursuant to Section IV, Condition D, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. Enclosure 1 provides the status report, which includes an update of Phase 1 and 2 milestone accomplishments, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

Enclosure 2 to this letter provides responses to various HCVS Order Phase 1 Open Items. The Phase 1 Open Items are identified in the NRC's Interim Staff Evaluation (Reference 12).

Please contact John Fields, Fukushima Response Licensing, at 763-271-6707, if additional information or clarification is required.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 14, 2017.

Peter A. Gardner
Site Vice President, Monticello Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Monticello Nuclear Generating Plant, USNRC
Resident Inspector, Monticello Nuclear Generating Plant, USNRC

ENCLOSURE 1

MONTICELLO NUCLEAR GENERATING PLANT

**SIXTH SIX-MONTH STATUS REPORT
FOR THE IMPLEMENTATION OF NRC ORDER EA-13-109,
"ORDER MODIFYING LICENSES WITH REGARD TO RELIABLE HARDENED CONTAINMENT VENTS CAPABLE OF OPERATION UNDER SEVERE ACCIDENT CONDITIONS, PHASES 1 AND 2"**

1.0 Introduction

Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, developed a Phase 1 Overall Integrated Plan (OIP) (Reference 1) for the Monticello Nuclear Generating Plant (MNGP), in response to Reference 2. The Phase 1 OIP documents the installation of a Hardened Containment Vent System (HCVS) that provides a reliable wetwell 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. Starting with the fourth six-month status report (Reference 12), updates of milestone accomplishments were based on the combined Phase 1 and 2 OIP, (Reference 9). The fifth six-month status report was provided in Reference 14. Previous status reports for Phase 1 only were provided to the NRC in References 6 and 8.

NSPM developed an updated and combined Phase 1 and 2 OIP (Reference 9), documenting:

1. The installation of a 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 Phase 1 and 2 OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

2.0 Milestone Accomplishments

The original milestone schedule with target dates was provided in Part 5 of the combined Phase 1 and Phase 2 OIP (Reference 9). The milestone dates are updated, if necessary, in the six-month status reports. Seven milestones were completed since

the last six-month status report and prior to May 31, 2017. The seven milestones are all related to Phase 1 of the HCVS Order. The seven milestones completed were:

- Phase 1 Implementation Outage – NSPM completed the HCVS Phase 1 implementation outage in May 2017.
- Walk Through Demonstration/Functional Test – NSPM performed functional testing of the modifications installed to support HCVS Phase 1 Order requirements. The modifications and associated functional testing were completed in May 2017. Additional walkthrough demonstrations of the HCVS Order Phase 1 were not required as the implementation of venting was not significantly different than that previously demonstrated and validated under the Mitigating Strategies Order (FLEX, NRC Order EA-12-049).
- Operations Procedure Changes Developed – NSPM completed the Operations Procedure Changes in support of HCVS Order Phase 1 in May 2017.
- Site Specific Maintenance Procedure Developed - NSPM completed the Maintenance Procedure Changes in support of HCVS Order Phase 1 in May 2017.
- Procedure Changes Active – NSPM completed the activation of Operations and Maintenance procedures in support of HCVS Order Phase 1 in May 2017.
- Training Complete - NSPM completed the Training required to support the modifications and procedure changes in support of HCVS Order Phase 1 in March 2017.
- HCVS Implementation – NSPM completed the Implementation of the HCVS Order Phase 1 on May 11, 2017.

3.0 Milestone Schedule Status

The following provides an update to Part 5 of the combined Phase 1 and 2 OIP (Reference 9). 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 (i.e., not considered formal regulatory commitments). This schedule is current as of May 31, 2017.

One milestone is changed in this report. The milestone to Submit Completion Report for Phase 1 of the HCVS Order is no longer required, per NRC direction.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Phase 1 and 2 HCVS Milestone Table			
Submit Phase 1 OIP	June 2014	Complete	
Submit 6 Month Updates:			
Update 1	December 2014	Complete	
Update 2	June 2015	Complete	
Update 3 (with Phase 2 OIP)	December 2015	Complete	
Update 4	June 2016	Complete	
Update 5	December 2016	Complete	
Update 6	June 2017	Complete with this Submittal	
Update 7	December 2017	Not Started	
Update 8	June 2018	Not Started	
Update 9	December 2018	Not Started	
Phase 1 Specific Milestones			
Phase 1 Modifications:			
Hold preliminary/conceptual design meeting	June 2014	Complete	
Design Engineering On-site/Complete	November 2016	Complete	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Implementation Outage	May 2017	Complete	
Walk Through Demonstration/Functional Test	May 2017	Complete	
Phase 1 Procedure Changes Active:			
Operations Procedure Changes Developed	May 2017	Complete	
Site Specific Maintenance Procedure Developed	May 2017	Complete	
Procedure Changes Active	May 2017	Complete	
Phase 1 Training:			
Training Complete	May 2017	Complete	
Phase 1 Completion:			
HCVS Implementation	May 2017	Complete	
Submit Completion Report	July 2017	Not Required	Milestone is not required per NRC direction.
Phase 2 Specific Milestones			
Phase 2 Modifications:			
Hold preliminary/conceptual design meeting	October 2015	Complete	
Design Engineering On-site/Complete	June 2018	Not Started	
Implementation Outage	May 2019	Not Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Walk Through Demonstration/Functional Test	May 2019	Not Started	
Phase 2 Procedure Changes Active:			
Operations Procedure Changes Developed	December 2018	Not Started	
Site Specific Maintenance Procedure Developed	December 2018	Not Started	
Procedure Changes Active	May 2019	Not Started	
Phase 2 Training:			
Training Complete	May 2019	Not Started	
Phase 2 Completion:			
HCVS Implementation	May 2019	Not Started	
Submit Completion Report	July 2019	Not Started	

4.0 Proposed Changes to Compliance Method

There are no changes to the compliance methods as documented in the combined Phase 1 and 2 OIP (Reference 9). Updates to information in the OIP are discussed below.

OIP Update – Electrical Component Qualification

In Reference 9, Part 2, NSPM stated that any HCVS order electrical components that interface with Class 1E power sources would be considered safety related and that the remaining components would be considered augmented quality components.

As described in the response to ISE Open Item 10 in Enclosure 2, not all electrical components installed for the HCVS Order Phase 1 compliance are safety related or augmented quality. However, all components are qualified for the expected conditions that may occur should an ELAP with core damage occur.

OIP Update – Electrical Conduit Seismic Classification

In Reference 9, Part 2, NSPM stated that conduit designs will be installed to Seismic Class 1 Criteria.

The conduit work in support of the HCVS modifications to complete Phase 1 of the order were considered non-safety related installations. The conduit that was installed was required to be Underwriters Laboratory (UL) listed. The conduit was installed to Seismic II/I criteria, which ensures the conduit will not collapse in a design basis seismic event.

OIP Update – Backup Operating Station Valve Controls

In Reference 9, Part 2, NSPM stated that controls required to open the HCVS at the backup operating station (Remote Operating Station (ROS)) will be secured.

A key-lock switch is provided for the HCVS Primary Containment Isolation Valve controls at the Alternate Shutdown System Panel where the Primary Operating Station is provided. However, at the nitrogen bottles, manual isolation valves were installed, and these valves are normally closed but are not secured. Multiple actions (i.e. at the nitrogen bottles and at the ROS) are required to open an HCVS containment isolation valve or to rupture the rupture disk, therefore, inadvertent operation is not credible.

OIP Update – Drill/Exercise Performance

In Reference 9, Part 4, NSPM stated that the site will utilize the guidance provided in NEI 13-06 and 14-01 for guidance related to drills, tabletops, or exercises for HCVS operation. In addition, the site will integrate these requirements with compliance to any rulemaking resulting from the NTTF Recommendations 8 and 9.

It is NSPM's intention to comply with drill/exercise performance requirements consistent with the final 10 CFR 50.155 language. NSPM will continue to utilize the guidance of NEI 13-06 and NEI 14-01 insofar as it is consistent with the regulatory requirements promulgated in the final rulemaking.

5.0 Need and Basis for Relief/Relaxation from the Requirements of the Order

NSPM expects to comply with the order implementation date and no relief/relaxation is required at this time.

6.0 Open Items from Combined Overall Integrated Plan and Interim Staff Evaluation

The following tables provide a summary of the open items documented in the combined Phase 1 and 2 OIP (Reference 9) and the Interim Staff Evaluations (ISE) (References 7 and 13) and the status of each item.

OIP Phase 1 Open Items	Status
1. Follow industry guidance on missile protection for HCVS.	Closed - see ISE Phase 1 Open Item 5
2. Identify the 24 hour power supply for the HCVS.	Closed – see ISE Phase 1 Open Item 1
3. Determine radiological conditions for the FLEX portable equipment staging areas.	Closed – see ISE Phase 1 Open Item 3
4. Evaluate the Alternate Shutdown System (ASDS) panel and Backup HCVS Operation Station locations for accessibility, habitability, staffing sufficiency, associated pathways from the control room and communication capability with vent-use decision makers.	Closed – see ISE Phase 1 Open Items 3 and 7
5. Determine approach or combination of approaches to control hydrogen.	Closed – see ISE Phase 1 Open Items 8 and 9
6. Determine the Qualification Method for HCVS instrumentation.	Closed – see ISE Phase 1 Open Item 10
7. Evaluate the effects of radiological and temperature constraints on the deployment of nitrogen bottles after 24 hours.	Closed – see ISE Phase 1 Open Item 3
8. Evaluate HCVS battery charger location for accessibility, habitability, staffing sufficiency, associated pathways from control room and communication capability with vent-use decision makers.	Closed – see ISE Phase 1 Open Items 3 and 7

OIP Phase 2 Open Items	Status
1. Determine approach to repower Low Pressure Coolant Injection (LPCI) swing bus from FLEX PDG.	Open

ISE Phase 1 Open Items	Status
1. Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX Diesel Generator (DG) loading calculation.	Complete See Enclosure 2
2. Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.	Complete See Enclosure 2
3. 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.	Complete See Enclosure 2
4. 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.	Complete See Reference 14
5. Make available for NRC staff audit the seismic and tornado missile final design criteria for the HCVS stack.	Complete See Reference 14
6. Make available for NRC staff audit the descriptions of local conditions (temperature, radiation and humidity) anticipated during Extended Loss of AC Power (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.	Complete See Enclosure 2
7. 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.	Complete See Enclosure 2

ISE Phase 1 Open Items	Status
8. Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration.	Complete See Reference 14
9. 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.	Complete See Enclosure 2
10. Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	Complete See Enclosure 2
11. Make available for NRC staff audit documentation of an evaluation verifying the existing containment isolation valves, relied upon for the HCVS, will open under the maximum expected differential pressure during Beyond Design Basis External Event (BDBEE) and severe accident wetwell venting.	Complete See Reference 14

ISE Phase 2 Open Items	Status
1. Licensee to provide the plant specific justification for SAWA [Severe Accident Water Addition] flow capacity less than specified in the guidance in NEI 13-02, Section 4.1.1.2.	Open
2. Licensee to evaluate the SAWA equipment and controls, as well as the ingress and egress paths for the expected severe accident conditions (temperature, humidity, radiation) for the sustained operating period.	Open
3. 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.	Open
4. Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions.	Open
5. Licensee to demonstrate how the plant is bounded by the reference plant analysis that shows the SAWM [Severe Accident Water Management] strategy is successful in making it unlikely that a drywell vent is needed.	Open

ISE Phase 2 Open Items	Status
6. Licensee to demonstrate that there is adequate communication between the MCR [Main Control Room] and the Intake Structure operator at the FLEX manual valve during severe accident conditions.	Open
7. Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions.	Open

7.0 Interim Staff Evaluation Impacts

There are no potential impacts to the Phase 1 or 2 ISE identified at this time.

8.0 References

The following references support the updates to the combined Phase 1 and 2 OIP described in this enclosure.

1. Letter from K. Fili (NSPM) to Document Control Desk (NRC), "MNGP's 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)," L-MT-14-052, dated June 30, 2014. (ADAMS Accession No. ML14183A412)
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. (ADAMS Accession No. ML13143A334)
3. NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 0, dated November 2013. (ADAMS Accession No. ML13316A853)
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 14, 2013. (ADAMS Accession No. ML13304B836)
5. Letter from D. Skeen (NRC) to J. Pollock (NEI), Endorsement of Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Rev 0, dated May 14, 2014. (ADAMS Accession No. ML14128A219)
6. Letter from K. Fili (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: First Six-Month Status Report 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)," L-MT-14-092, dated December 16, 2014. (ADAMS Accession No. ML14353A215)

7. Letter from M. Halter (NRC) to P. Gardner (NSPM). "Monticello Nuclear Generating Plant - Interim Staff Evaluation Relating To Overall Integrated Plan In Response To Phase One Of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4376)," dated April 2, 2015. (ADAMS Accession No. ML15082A167)
8. Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: Second Six-Month Status Report 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), Phase 1," L-MT-15-031, dated June 22, 2015. (ADAMS Accession No. ML15173A176)
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10. 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)
11. NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 1, dated April 2015. (ADAMS Accession No. ML15113B318)
12. Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Nuclear Generating Plant: Fourth Six-Month Status Report 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), Phases 1 and 2," L-MT-16-034, dated June 17, 2016. (ADAMS Accession No. ML16169A309)
13. Letter from J. Quichocho (NRC) to P. Gardner (NSPM), "Subject: Monticello Nuclear Generating Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (CAC No. MF4376),"dated September 6, 2016. (ADAMS Accession No. ML16244A120)

14. Letter from P. Gardner (NSPM) to Document Control Desk (NRC), “Monticello Nuclear Generating Plant: Fifth Six-Month Status Report 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), Phases 1 and 2,” L-MT-16-072, dated December 19, 2016. (ADAMS Accession No. ML16354A666)

ENCLOSURE 2

MONTICELLO NUCLEAR GENERATING PLANT

RESPONSES TO OPEN ITEMS
ASSOCIATED WITH NRC ORDER EA-13-109, PHASE 1

ORDER MODIFYING LICENSES WITH REGARD TO RELIABLE HARDENED CONTAINMENT VENTS CAPABLE OF OPERATION UNDER SEVERE ACCIDENT CONDITIONS

Introduction:

This enclosure provides responses to the following Open Items from the NRC Hardened Containment Vent System (HCVS) Interim Staff Evaluation (Reference 1) for the Monticello Nuclear Generating Plant (MNGP):

Open Item #	Description
1	Sizing of HCVS Battery/Battery Charger
2	Design Information for HCVS Nitrogen Pneumatic System
3	Evaluation of Temperature and Radiological Conditions for Operating Personnel
6	Description of Local Environmental Conditions for HCVS Components during HCVS Venting
7	Demonstrate that Adequate Communications Exist during ELAP [extended loss of AC Power] and Severe Accident Conditions
9	Description of Hydrogen Control Strategy
10	Description of Qualification of HCVS Instrumentation and Controls

References:

1. Letter from M. Halter (NRC) to P. Gardner (NSPM), “Subject: Monticello Nuclear Generating Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase One of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC No. MF4376),”dated April 2, 2015. (ADAMS Accession No. ML15082A167)

Open Item Responses:

Open Item 1 - Sizing of HCVS Battery/Battery Charger:

NRC Request

Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.

NSPM Response

A calculation has been performed that confirms that the HCVS battery and battery charger are sized adequately. The results of the analysis show that the battery is adequately sized to supply power to the HCVS devices for twenty-four (24) hours following the onset of an ELAP. The analysis results also show that the minimum calculated terminal voltage at the devices is above the minimum voltage required for each HCVS device while being supplied from the battery.

The design allows for use of the Diverse and Flexible Coping Strategies (FLEX) equipment (i.e. FLEX generator) to power the system after 24 hours. The design incorporates a manual, break-before-make transfer switch to transfer the load from the normal HCVS power supply to 250VDC battery number 16. During an ELAP event, the 16 battery, through its associated battery charger, will be connected to and powered from the FLEX portable diesel generator per procedure.

An engineering evaluation was performed to demonstrate that the FLEX 480 V Diesel Generator is of adequate size to support these loads. The evaluation determined that the FLEX 480 V Diesel Generator is capable of supplying the battery chargers for the 11, 12, 13, and 16 batteries at current limits. Therefore, the FLEX 480 V Diesel Generator has the required capacity to supply the HCVS loads since it is sized for the full capacity of the battery chargers.

The calculation and evaluations have been provided to the NRC on the eportal.

Open Item 2 - Design Information for HCVS Nitrogen Pneumatic System:

NRC Request

Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.

NSPM Response

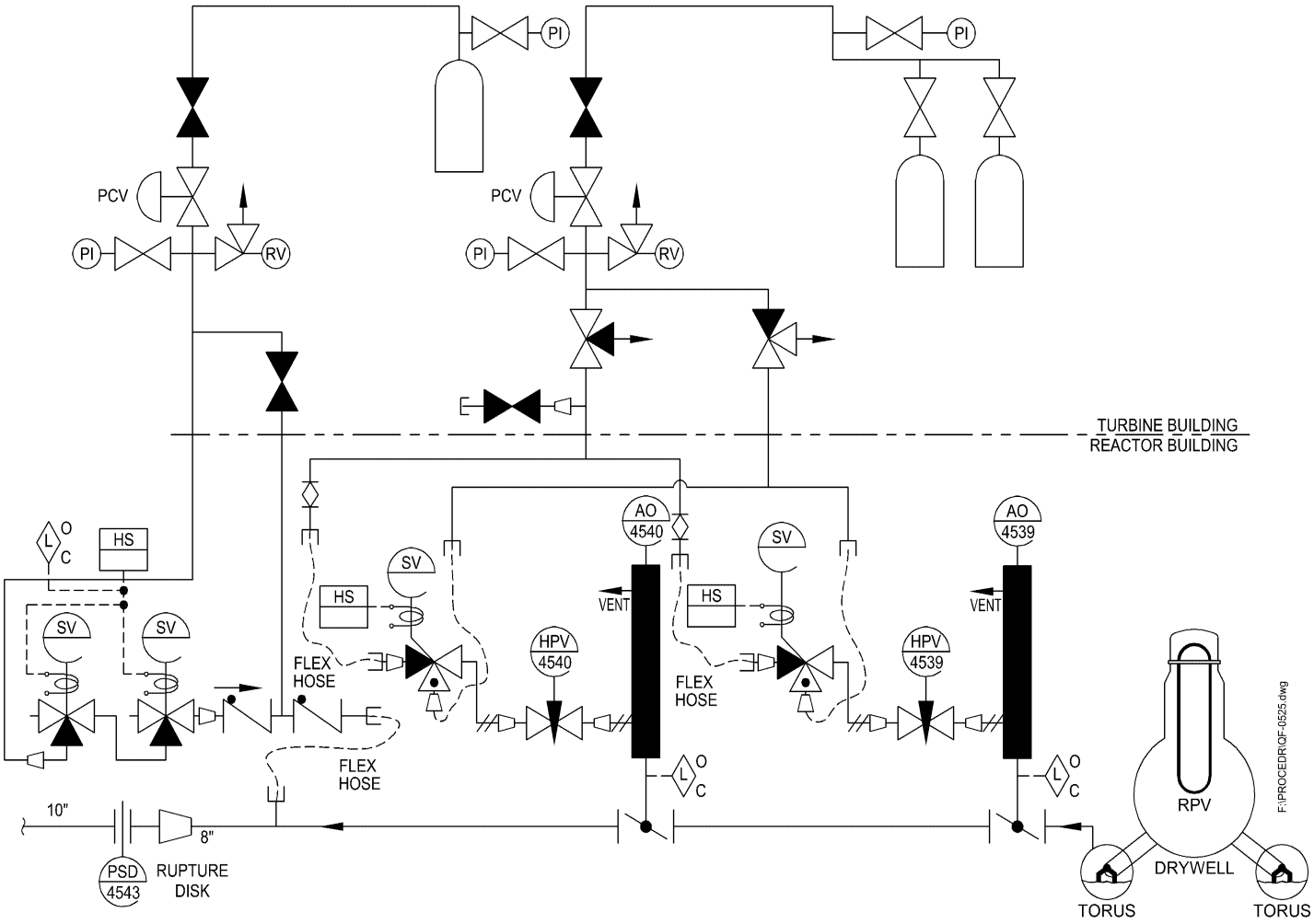
A calculation has been performed that confirms that the HCVS two (2) nitrogen supply systems that provide pneumatic capacity to the HCVS rupture disc and containment isolation valves are sized adequately. This calculation determined that one (1) nitrogen bottle is required to fully burst the HCVS rupture disc and two (2) nitrogen bottles are required to actuate the primary containment isolation valves over 24 hours.

Two (2) new nitrogen supply systems are installed in the 931' east Turbine Building with a remote manual operating station located south of the nitrogen bottles near the B Alternate Nitrogen supply. Pneumatic tubing was routed through the Turbine Building, Condenser Room, Reactor Core Isolation Cooling (RCIC) Room, and Torus Room to the HCVS rupture disc and containment isolation valves. The primary location for control of the HCVS remains in the third floor Emergency Filtration Train (EFT) Building at the Alternate Shutdown System (ASDS) panel.

The design of the new HCVS nitrogen system is provided in Figure OI 2-1 below.

The calculation and drawings for the new nitrogen systems were provided to the NRC on the eportal.

Figure OI 2-1 - HCVS Nitrogen Pneumatic System



Open Item 3 - Evaluation of Temperature and Radiological Conditions for Operating Personnel:

NRC Request

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.

NSPM Response

The primary operating station (POS) for the HCVS is in the third floor of the EFT building and includes the controls for the HCVS as well as the instruments used to monitor drywell pressure, suppression pool level, HCVS radiation, and HCVS temperature. The remote operating station (ROS) is located in the 931' elevation of the turbine building east side. The nitrogen bottle rack, controls, and indicators are located at the north end of 931' east and the ROS valves are located at the south end of 931' east.

Dose rates due to the Beyond Design Basis External Event (BDBEE) and the HCVS order severe accident conditions assumed in the containment atmosphere during HPV operation were determined by calculation using the methodology in NEI-13-02, Rev 1 and HCVS-WP-02, Rev 0. The seven day integrated dose values at the POS and ROS locations are well within the dose limit of 5 rem. Transit paths and locations outside of the Reactor and/or HPCI Building have unlimited access up to 7 hours after ELAP. Additionally, transit paths are acceptable for short durations after venting has started based on the expected peak dose rates. The FLEX Pump and FLEX Generator deployment locations were evaluated for a 7-day integrated dose and selected locations are accessible. Dose the operator receives is administratively controlled by health physics personnel to ensure set dose rates and dose limits are not exceeded.

Temperature in the EFT building third floor (e.g. POS) during an ELAP in the summer will peak at approximately 135°F at 12 hours. By hour 12, supplemental ventilation will be installed per procedure and room temperature will then be maintained below 120°F for the duration of the 7 day period. Room temperature in the winter will drop to 35°F after 24 hours and 0°F at the end of 7 days with no mitigating actions taken. Procedures direct operators to add portable heaters as needed within 15 hours upon initiation of an ELAP to maintain EFT building third floor temperatures above 40°F.

Temperature in the Turbine Building 931' east side corridor (near the ROS) in the winter will drop to 29°F after 24 hours and 0°F at the end of 7 days with no mitigating actions taken. HCVS equipment in this area can perform its function in these low temperature conditions and therefore is acceptable. Summer peak temperatures in this area are not a concern due to a lack of heat loads in the area during an ELAP.

The different pathways between the Reactor Building, EFT Building, and Turbine Building were analyzed and it was determined that there are no substantial heat sources in these areas that would cause a significant change in temperature.

The analyses and supporting information described has been provided to the NRC in the eportal.

Open Item 6 - Description of Local Environmental Conditions for HCVS Components during HCVS Venting:

NRC Request

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.

NSPM Response

Equipment Locations:
The primary operating station (POS) for the HCVS is in the third floor of the EFT building and includes the controls for the HCVS as well as the instruments used to monitor drywell pressure, suppression pool level, HCVS radiation, and HCVS temperature.

The remote operating station (ROS) is located in the south end of the 931' elevation of the Turbine Building east side. The nitrogen bottle rack, controls, and pressure indicators are located at the north end of the 931' elevation of the Turbine Building east side.

The primary containment isolation valves (PCIVs) and associated solenoid valves (SVs) are installed in the vent piping near the torus connection in the Reactor Building elevation 923' above the NE section of the torus. The suppression pool level transmitter LT7338B is located in the torus room bay 9.

The radiation detector is installed adjacent to the pipe above the HPCI room at elevation 935'. The temperature element is installed in the HPCI room adjacent to the vent pipe at elevation 928'.

The drywell pressure transmitter PT7251B is located in the Reactor Building, elevation 985' south wall.

Radiological Conditions:
Radiological dose rates resulting from HCVS venting were determined by calculation for each area using the methodology in NEI-13-02, Rev 1 and HCVS-WP-02, Rev 0.

Temperature/ Humidity Conditions:
Temperature conditions for each area have been determined by calculation, using the methodology in NEI-13-02, Rev 1. An additional analysis was performed to determine the severe accident temperature in the torus room.

The calculations determined that key components necessary for HCVS venting are capable of performing their intended functions under ELAP and severe accident conditions.

The analyses and supporting information that support these conclusions have been provided to the NRC in the eportal.

Open Item 7 - Demonstrate that Adequate Communications Exist during ELAP and Severe Accident Conditions:

NRC Request

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.

NSPM Response

The HCVS controls are located on the ASDS panel located on the third floor of the EFT building. Primary containment pressure and suppression pool level indicators are located on the ASDS panel. Suppression pool temperature, HCVS temperature, and HCVS radiation indicators are on the panel adjoining the ASDS panel. These are the indicators used by the Operator to monitor the primary containment and HCVS when making decisions regarding use of the HCVS during severe accident conditions.

When dispatched from the control room, the Operator sent to the ASDS panel will have been given a containment pressure control band by the Control Room Supervisor per procedure. Procedural guidance for operating the HCVS is maintained both in the control room and at the ASDS panel. Therefore, the Operator actuating the HCVS from the ASDS panel requires no further communication.

Should actuation of the HCVS from the ASDS panel fail, the HCVS can be actuated by an Operator manipulating manual valves at the ROS, located on the east side of the 931 foot elevation of the Turbine Building. This Operator will be in communication with a second Operator who is at the ASDS panel monitoring the primary containment and

HCVS. These Operators will be in communication via the telephone system. There is a phone on the ASDS panel and a phone in the Turbine Building, a short distance from the HCVS ROS.

The MNGP phone system is powered by the Non-1E Uninterruptable Power Supply (Y91), which is powered from the site non-essential 250 volt battery. A calculation determined that the non-essential 250 volt battery will maintain power to the portion of the site phone system supplied from Y91 energized for 12 hours following an ELAP event. Phones that remain energized include the phone at the ASDS panel, the Control Room Supervisor's phone in the Main Control Room, and the phone in the Turbine Building near the HCVS ROS.

In response to NRC Order EA-12-049 (Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design Basis External Events), NSPM developed and implemented FLEX Support Guidelines (FSGs) to provide pre-planned procedures to improve the stations capability to cope with beyond design basis events. As part of the FLEX response, MNGP has an FSG procedure to stage a 120 volt portable diesel generator and a procedure to use this generator to repower the phone system. Timing studies performed as part of FLEX implementation have shown the phone system can be repowered from the portable diesel generator within 12 hours.

Since the phones required for communication at the ASDS panel and the HCVS ROS will be repowered from a portable diesel generator before power is lost from the site non-essential 250 volt battery, the phone system remains available at all times for communication between the Operator at the HCVS ROS and the Operator at the ASDS panel.

The calculation and procedures described in this response have been provided to the NRC on the eportal.

Open Item 9 - Description of Hydrogen Control Strategy:

NRC Request

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.

NSPM Response

The HCVS utilizes a dedicated penetration from the torus to HCVS piping, which is routed through the Reactor Building. The HCVS piping does not pass through other buildings thus eliminating the potential for migration of hydrogen gas from the HCVS into other buildings.

A check valve is provided on the rupture disc pneumatic supply connection to the HCVS piping to prevent backflow to the remote operating station (see Figure OI 2-1 in Open Item Response 2). With exception of the rupture disc pneumatic supply, the HCVS piping is designed to have no interfaces with other plant systems, and all valves that open external to the system are designed to the system operating conditions. Once the rupture disk is burst the pneumatic supply will be isolated to prevent migration of hydrogen gas into the pneumatic supply system.

Initial and periodic testing of the HCVS will be performed in accordance with manufacturer instructions and the NEI 13-02 guidance. This includes leak tests which will ensure leak tightness of the HCVS to prevent hydrogen gas ingress into the Reactor Building.

Finally, the HCVS outlet is above plant structures, and is designed to direct the vent discharge away from structures and ventilation inlets and outlets.

With these design features, the HCVS meets the requirement for minimizing the potential for hydrogen gas migration and ingress into the Reactor Building or other site buildings.

The design documents and procedures described in this response have been provided to the NRC on the eportal.

Open Item 10 - Description of Qualification of HCVS Instrumentation and Controls:

NRC Request

Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.

NSPM Response

Required Instrumentation and Controls:

As documented in the MNGP Overall Integrated Plan (OIP), the following instrumentation and controls are required for order compliance:

- Valve Position Indication
- Effluent Temperature
- Wetwell Level
- Effluent Discharge Radioactivity
- Containment Pressure
- Electrical Power

- Remote Operating Station Valves
- Pneumatic Supply Pressure Indications and Manual Valves

Qualification Methods:

The OIP provides the following information related to component qualification:

> *"The HCVS instruments, including valve position indication, process instrumentation, radiation monitoring, and support system monitoring, will be qualified by using one or more of the three methods described in the ISG, which includes:*
>
> *1. Purchase of instruments and supporting components with known operating principles from manufacturers with commercial quality assurance programs (e.g., ISO9001) where the procurement specifications include the applicable seismic requirements, design requirements, and applicable testing.*
>
> *2. Demonstration of seismic reliability via methods that predict performance described in IEEE 344-2004.*
>
> *3. Demonstration that instrumentation is substantially similar to the design of instrumentation previously qualified."*

Component	**Qualification Methods**
Valve Position Indication	The qualification method for the handswitches and lights use for valve position indication is based on demonstration that the controls are the same or similar to the design previously qualified.
Effluent Temperature	Qualification methods are in accordance with IEEE 323-1974 and 1983, IEEE 344-1975 and 1987, and NUREG 0588.
Wetwell Level	This is an existing component that was installed in the safety related, seismically qualified ASDS panel C-292. The meter's qualification method is in accordance with IEEE 344-1975.
Remote Operating Station Valves	Qualification method is based on the design which demonstrates seismic qualification.
Effluent Discharge Radioactivity	Qualification methods for the radiation monitoring system are based on vendor qualification and engineering analysis.
Containment Pressure	Qualification methods are in accordance with IEEE 344-1987 and IEEE 323-1983. The new instrument is safety related and seismically qualified.

Component	**Qualification Methods**
Electrical Power	Qualification method is based on demonstration that the instrumentation is substantially similar to the design of instrumentation previously qualified.
Pneumatic Supply Pressure Indications and Manual Valves	Qualification method is in accordance with IEEE 344-2004.

All components were determined to have acceptable qualifications to meet the HCVS order requirements.

The analyses and supporting information that support these conclusions have been provided to the NRC in the eportal.