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U. S. Nuclear Regulatory Commission
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Edwin I. Hatch Nuclear Plant – Units 1 and 2
Sixth Six-Month Status Report of the Implementation of the
Commission Order with Regard to Requirements for
Reliable Hardened Containment Vents (EA-13-109)

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.
2. SNC Letter, *Edwin I. Hatch Nuclear Plant – Units 1 and 2 Phase 1 Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Requirements for Reliable Hardened Containment Vents (EA-13-109)*, dated June 27, 2014.
3. SNC Letter, *Edwin I. Hatch Nuclear Plant – Units 1 and 2 Third Six-Month Status Report of the Implementation of Commission Order with Regard to Requirements for Reliable Hardened Containment Vents (EA-13-109)*, dated December 23, 2015.

Ladies and Gentlemen:

On June 6, 2013, the Nuclear Regulatory Commission (NRC) issued an Order (Reference 1) to Southern Nuclear Operating Company (SNC). Reference 1 was immediately effective and directs the Edwin I. Hatch Nuclear Plant - Units 1 and 2 (HNP) 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. Specific requirements are outlined in Attachment 2 of Reference 1.

In addition, Reference 1 also required submission of a Phase 1 overall integrated plan pursuant to Section IV, Condition D, and status reports at six-month intervals thereafter. SNC submitted the Phase 1 overall integrated plan (OIP) by letter dated June 27, 2014 (Reference 2). The third six-month update for Phase 1 of the Order included the required HCVS Phase 2 OIP submittal, and was submitted on December 23, 2015 (Reference 3). The consolidated HCVS Phase 1 and 2 OIP document (Reference 3) provided a list of the Phase 1 OIP open items, and addressed the NRC Interim Staff Evaluation open items for Phase 1. This letter is being submitted to

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satisfy the requirements for providing the six-month updates for Phase 1 and 2 of the Order in accordance with Section IV, Condition D.3, of Reference 1.

This letter contains no new NRC commitments. If you have any questions, please contact Matt Euten at 205.992.7673.

Mr. J. J. Hutto states he is the Regulatory Affairs Director for Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and, to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,



J. J. Hutto
Regulatory Affairs Director

JJH/JMG/GLS

Sworn to and subscribed before me this 12 day of June, 2017.



Laura L. Crisp
Notary Public

My commission expires: 10-8-2017

Enclosure: Sixth Six-Month Status Report Regarding Requirements for Reliable Hardened Containment Vents (EA-13-109)

cc: Regional Administrator, Region II
NRR Project Manager – Hatch
Senior Resident Inspector – Hatch
Director, Environmental Protection Division – State of Georgia
RType: CHA02.004



**Edwin I. Hatch Nuclear Plant – Units 1 and 2
Sixth Six-Month Status Report of the Implementation of the
Commission Order with Regard to Requirements for
Reliable Hardened Containment Vents (EA-13-109)**

Enclosure

**Sixth Six-Month Status Report Regarding Requirement for
Reliable Hardened Containment Vents (EA-13-109)**

**Edwin I. Hatch Nuclear Plant – Units 1 and 2
Sixth Six Month Status Report for the Implementation of Order EA-13-109**

1 Introduction

Southern Nuclear Operating Company developed an Overall Integrated Plan (References 1 and 8) for the Edwin I. Hatch Nuclear Plant – Units 1 and 2 (HNP) documenting the installation of a Hardened Containment Vent System (HCVS). Updates of milestone accomplishments are based on the combined Phase 1 and 2 Overall Integrated Plan dated December 23, 2015.

HNP developed an updated and combined Phase 1 and 2 Overall Integrated Plan (Reference 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 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.

HNP has elected to upgrade the existing HCVS to comply with the requirements of EA-13-109 for Phase 1 and 2 under Revision 1 of NEI 13-02. Revision 1 of NEI 13-02 addresses methodology to implement Phase 2 requirements of order EA-13-109 and additional clarifications and guidance for implementation of Phase 1.

This enclosure provides an update of milestone accomplishments since submittal of the combined Phase 1 and 2 Overall Integrated Plan (Reference 8), 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 development of the combined Phase 1 and 2 Overall Integrated Plan (Reference 8), and are current as of April 30, 2017.

- Phase 1 Unit 1 Design Engineering On-site/Complete
- Phase 1 Unit 2 Walk Through Demonstration/Functional Test
- Phase 1 Unit 2 Implementation Outage
- Phase 1 Unit 2 Site Specific Maintenance Procedures
- Phase 1 Unit 2 Procedure Changes Active
- Phase 1 Unit 2 HCVS Implementation
- Phase 1 Unit 2 Training Complete
- Phase 2 Hold preliminary/conceptual design meeting
- Phase 2 Unit 1 Design Engineering On-site/Complete

3 Milestone Schedule Status

The following provides an update to Attachment 2 of the combined Phase 1 and 2 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 milestone target completion dates do not impact the order implementation date.

Phase 1 and 2 HCVS Milestone Table

Milestone	Target Completion Date	Activity Status	Comments
Submit Overall Integrated Plan	Jun. 2014	Complete	
Submit 6 Month Updates:			
Update 1	Dec. 2014	Complete	
Update 2	Jun. 2015	Complete	
Update 3	Dec. 2015	Complete	Simultaneous with Phase 2 OIP
Update 4	Jun. 2016	Complete	
Update 5	Dec. 2016	Complete	
Update 6	Jun. 2017	Complete with this submittal	
Update 7	Dec. 2017	Not Started	
Phase 1 Specific Milestones			
Phase 1 Modifications:			
Hold preliminary/conceptual design meeting	Jun. 2014	Complete	
Unit 1 Design Engineering On-site/Complete	Feb. 2017	Complete	Completed April 2017
Unit 1 Implementation Outage	Mar. 2018	Not Started	
Unit 1 Walk Through Demonstration/Functional Test	Mar. 2018	Not Started	
Unit 2 Design Engineering On-site/Complete	May 2016	Complete	
Unit 2 Walk Through Demonstration/Functional Test	Feb. 2017	Complete	

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Milestone	Target Completion Date	Activity Status	Comments
Unit 2 Implementation Outage	Feb. 2017	Complete	
Phase 1 Procedure Changes			
Operations Procedure Changes Developed	Dec. 2017	Complete Unit 2	Current Projection Unit 1 Mar. 2018
Site Specific Maintenance Procedure Developed	Jan. 2017	Complete Unit 2	Current Projection Unit 1 Mar. 2018
Procedure Changes Active	Feb. 2017	Complete Unit 2	Current Projection Unit 1 Mar. 2018
Phase 1 Training:			
Training Complete	Dec. 2016	Complete Unit 2	Current Projection Unit 1 Mar. 2018
Phase 1 Completion			
Unit 2 HCVS Implementation	Feb. 2017	Complete	
Unit 1 HCVS Implementation	Mar. 2018	Started	Current Projection Feb. 2018
Full Site HCVS Implementation	Mar. 2018	Started	Current Projection Feb. 2018
Phase 2 Specific Milestones			
Phase 2 Modifications:			
Hold preliminary/conceptual design meeting	Apr. 2016	Complete	No modifications expected. Engineering evaluations and associated non-modification changes scope definition by Mar 2017
Unit 1 Design Engineering On-site/Complete	Feb. 2017	Complete	No modifications expected. Engineering evaluations and associated non-modification changes by Oct 2017
Unit 1 Walk Through Demonstration/Functional Test	Mar. 2018	Not Started	Current Projection Feb. 2018
Unit 1 Implementation Outage	Mar. 2018	Not Started	Current Projection Feb. 2018

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Milestone	Target Completion Date	Activity Status	Comments
Unit 2 Design Engineering On-site/Complete	Feb. 2018	Not Started	No modifications expected. Engineering evaluations and associated non-modification changes by Oct 2018
Unit 2 Walk Through Demonstration/Functional Test	Mar. 2019	Not Started	Current Projection Feb. 2019
Unit 2 Implementation Outage	Mar. 2019	Not Started	Current Projection Feb. 2019
Phase 2 Procedure Changes			
Operations Procedure Changes Developed	Sep. 2017	Not Started	Current Projection Feb. 2018
Site Specific Maintenance Procedure Developed	Dec. 2017	Not Started	
Procedure Changes Active	Mar. 2018	Not Started	Current Projection Mar. 2019
Phase 2 Training:			
Training Complete	Dec. 2017	Not Started	
Phase 2 Completion			
Unit 1 HCVS Implementation	Mar. 2018	Not Started	Current Projection Feb. 2018
Submit Unit 1 Phase 1 and 2 Completion Report	May 2018	Not Started	Current Projection Apr. 2018
Unit 2 HCVS Implementation	Mar. 2019	Not Started	Current Projection Feb. 2019
Full Site HCVS Implementation	Mar. 2019	Not Started	Current Projection Feb. 2019
Submit Unit 2 and site Completion Report [60 days after full site compliance]	May 2019	Not Started	Current Projection Apr. 2019

4 Changes to Compliance Method

There are no changes to the compliance method as documented in the Phase 1 and 2 Overall Integrated Plan (Reference 8) and as described in the fifth six-month status report submitted December 14, 2016 (Reference 9).

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

Edwin I. Hatch Nuclear Plant – Units 1 and 2, expect to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items from Combined Phase 1 and 2 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 Overall Integrated Plan, the Phase 1 Interim Staff Evaluation (ISE) and the Phase 2 Staff Evaluation and an updated response to each item beyond that supplied in the fifth six-month status report submitted December 14, 2016 (Reference 9).

Hatch 1 & 2 HCVS Phase 1 and 2 OIP Open Items		Response
1	Determine location of Dedicated HCVS Battery transfer switch -	Documented Closed in Reference 9
2	Determine location of back-up nitrogen bottles	Documented Closed in Reference 9
3	Evaluate location of Portable DG for accessibility under Severe Accident HCVS use	Documented Closed in Reference 9
4	Confirm suppression pool heat capacity	Documented Closed in Reference 9
5	Determine location of HCVS Remote Operating Station	Documented Closed in Reference 9
6	State which approach or combination of approaches Plant Hatch decides to take to address the control of flammable gases, clearly demarcating the segments of vent system to which an approach applies	Documented Closed in Reference 9
7	Evaluate SGTS Valve Leakage utilizing criteria from NEI HCVS-FAQ-05 - Audit item per ISE	Documented Closed in Reference 9
8	Identify qualification method used for HCVS instruments - Audit item per ISE	Documented Closed in Reference 9
9	Evaluate HCVS monitoring location of Portable DG for accessibility, habitability, staffing sufficiency, and communication capability with Vent under Severe Accident HCVS use decision makers - Audit item per ISE	Documented Closed in Reference 9
10	Perform severe accident evaluation for FLEX DG use post 24 hour actions – Confirmatory Action	Documented Closed in Reference 9

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11	Determine the control document for HCVS out of service time criteria - Audit item per ISE	Documented Closed in Reference 9
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Hatch 1 & 2 HCVS Phase 1 ISE Open Items		Response
1	Make available for NRC staff audit the location of the ROS's	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
2	Make available for NRC staff audit the location of the dedicated HCVS battery transfer switch	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
3	Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
4	Make available for NRC staff audit the deployment location of the portable diesel generators	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
5	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017 Provided references in NEI 13-02, Rev 1, HNP HCVS Phase 1 and 2 OIP (Reference 8) and HNP FSAR for shielding. Provided updated figures 1-2 and 1-2 of HCVS Phase 1 and 2 OIP (Reference 8) showing locations of DGs and Control Panel operations on the e-Portal.
6	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
7	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017

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	devices, etc) required for HCVS venting including confirmation that the components are capable of performing their functions during ELAP and severe accident conditions	
8	Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017 Clarification with DOEJ-HDSNC598056-M002 and calculation SENH-16-003 on battery discharge temperature limitations: <i>The RPS battery room ventilation is sufficient to keep the temperature in the room below the maximum design space temperature of 100°F. The addition of the new equipment raises the temperature from 90°F to 98.25°F. This calculation used the max battery heat output and during normal operation the output will be less. Battery discharge assumption 7.4 assumes the room temperature increases to 122F and assumption 7.1 assumes the discharge occurs at 65F.</i>
9	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
10	Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
11	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
12	Make available descriptions of design details that minimize unintended cross flow of vented fluids within a unit and between units	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
13	Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017
14	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	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017

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	BDBEE and severe accident wetwell venting	
15	Make available for NRC staff audit the control document for HCVS out of service time criteria	Closed per Reference 9 and verified in NRC Audit call on March 7, 2017.

Hatch 1 & 2 HCVS Phase 2 ISE Open Items		Response
1	Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions Section 3.3.3	Closed per Reference 9, consistent with the BWROG generic closure criteria for Order EA-13-109 Phase 2 Open Items.
2	Licensee shall 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 Section 3.3.3.1	Closed per Reference 9, consistent with the BWROG generic closure criteria for Order EA-13-109 Phase 2 Open Items.
3	Licensee to demonstrate that there is adequate communication between the MCR and the Intake Structure operator at the FLEX manual valve during severe accident conditions. Section 3.3.3.4	Closed per Reference 9, consistent with the BWROG generic closure criteria for Order EA-13-109 Phase 2 Open Items.

7 Interim Staff Evaluation Impacts

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

8 Additional Information

No changes since fifth six-month status report submitted December 14, 2016 (Reference 9).

9 References

The following references support the updates to the Phase 1 and 2 Overall Integrated Plan (Reference 8) described in this enclosure:

1. SNC Letter, *Edwin I. Hatch Phase I Overall Integrated Plan in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Requirements for Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)*, dated June 27, 2014 (ML14178B464).
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 (ML13143A321).
3. NRC Endorsement, *Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan Template (EA-13-109) Revision 0*, dated May 14, 2014 (ML14128A219).
4. NRC Letter, *Edwin I. Hatch Nuclear Plant Units, 1 and 2 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe*

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Accident Capable Hardened Vents) (TAC Nos. MF4479 and MF4480), dated March 25, 2015 (ML14335A137).

5. 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 (ML15113B318).
6. 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 1*, dated April 2015 (ML15104A118).
7. NRC Endorsement of "Hardened Containment Venting System (HCVS) Phase 1 and 2 Overall Integrated Plan Template," Revision 1, dated September 22, 2015, and Frequently Asked Questions (FAQs) 10, 11, 12, and 13, dated October 8, 2015 (ML15271A148).
8. SNC Letter with Combined Phase 1 and 2 Overall Integrated Plan, *Edwin I. Hatch Nuclear Plant – Units 1 and 2 Third Six-Month Status Report of the Implementation of the Commission Order with Regard to Requirements for Reliable Hardened Containment Vents (EA-13-109)*, dated December 23, 2015 (ML15357A212).
9. SNC Letter, *Edwin I. Hatch Nuclear Plant – Units 1 and 2 Fifth Six-Month Status Report of the Implementation of Commission Order with Regard to Requirements for Reliable Hardened Containment Vents (EA-13-109)*, dated December 16, 2016.