Exelon Generation

Order No. EA-13-109

RS-18-058

June 22, 2018

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

LaSalle County Station, Unit 2
Renewed Facility Operating License No. NPF-18
NRC Docket No. 50-374

Subject: Eighth 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 30, 2014 (RS-14-059)
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 (RS-14-303)
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-15-149)

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 16, 2015 (RS-15-300)
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-16-107)
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-16-233)
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 29, 2017 (RS-17-065)
13. Exelon Generation Company, LLC 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), dated December 15, 2017 (RS-17-152)
14. NRC letter to Exelon Generation Company, LLC, LaSalle County Station, Units 1 and 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 Nos. MF4456 and MF4457), dated March 31, 2015
15. NRC letter to Exelon Generation Company, LLC, LaSalle County Station, Units 1 and 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 Nos. MF4456 and MF4457), dated August 2, 2016

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

Reference 1 required submission of an Overall Integrated Plan (OIP) by June 30, 2014 for Phase 1 of the Order, and an OIP by December 31, 2015 for Phase 2 of the Order. The interim staff guidance (References 2 and 3) provide direction regarding the content of the OIP for Phase 1 and Phase 2. Reference 3 endorses industry guidance document NEI 13-02, Revision 1 (Reference 4) with clarifications and exceptions identified in References 2 and 3. Reference 5

provided the EGC initial response regarding reliable hardened containment vents capable of operation under severe accident conditions. Reference 6 provided the LaSalle County 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 LaSalle County Station. Reference 9 provided the LaSalle County 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, 12, and 13 provided the fourth, fifth, sixth, and seventh six-month status reports pursuant to Section IV, Condition D.3 of Reference 1 for LaSalle County Station.

The purpose of this letter is to provide the eighth six-month update report 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 LaSalle County Station, Unit 2. The enclosed report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any. The enclosed report also addresses the NRC Interim Staff Evaluation open items contained in References 14 and 15.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 22nd day of June 2018.

Respectfully submitted,

David M. Gullott
Manager - Licensing
Exelon Generation Company, LLC

Enclosure:

LaSalle County Station, Unit 2 Eighth 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 III
NRC Senior Resident Inspector - LaSalle County Station
NRC Project Manager, NRR - LaSalle County Station
Mr. Rajender Auluck, NRR/JLD/TSD/JCBB, NRC
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Illinois Emergency Management Agency - Division of Nuclear Safety

Enclosure

LaSalle County Station, Unit 2

Eighth 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

(24 pages)

COMBINED PHASES 1 AND 2 SIX MONTH UPDATE

Enclosure

LaSalle Unit 2 Eighth Six Month Status Report for the Implementation of Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions"

1 Introduction

LaSalle developed an Overall Integrated Plan (Reference 1), 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 NRC Order EA-13-109 (Reference 2). Updates of milestone accomplishments are based on the combined Phases 1 and 2 Overall Integrated Plan (Reference 7), 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 latest status report, 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 December 1, 2017, and are current as of June 1, 2018:

- Eighth Six-Month Update (complete with this submittal)
- Unit 1 Phase 1 Implementation
- Unit 1 Phase 2 Implementation
- Submit Unit 1 Phases 1 & 2 Full Compliance Report
- Unit 2 Phase 2 Complete Detailed Design and Issue Modification Package

3 Milestone Schedule Status

The following provides an update to Attachment 2 of the combined Phases 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.

Phases 1 and 2 Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Submit Phase 1 Overall Integrated Plan	**Jun 2014**	Complete	
Submit 6 Month Updates			
Update 1	**Dec 2014**	Complete	
Update 2	**Jun 2015**	Complete	
Update 3 and Phase 2 Overall Integrated Plan	**Dec 2015**	Complete	
Update 4	**Jun 2016**	Complete	
Update 5	**Dec 2016**	Complete	
Update 6	**Jun 2017**	Complete	
Update 7	**Dec 2017**	Complete	
Update 8	**Jun 2018**	Complete	This submittal
Update 9	**Dec 2018**	Not Started	
Full Compliance			
Submit Unit 1 Phases 1 & 2 Full Compliance Report	**May 2018**	Complete	
Submit Unit 2 Phases 1 & 2 Full Compliance Report	**May 2019**	Not Started	

Phase 1 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Phase 1 Unit 2 Modifications			
Begin Conceptual Design	**Jun 2014**	Complete	
Complete Conceptual Design	**Jun 2014**	Complete	
Begin Detailed Design	**Jun 2015**	Complete	
Complete Detailed Design and Issue Modification Package	**Nov 2016**	Complete	
Begin Online Installation	**Jun 2016**	Complete	
Complete Online Installation	**Feb 2017**	Complete	
Begin Outage Installation	**Feb 2017**	Complete	
Complete Outage Installation and put system into service	**Mar 2017**	Complete	
Phase 1 Unit 2 Procedure Changes			
Operations Procedures Developed	**Dec 2016**	Complete	
Maintenance Procedures Developed	**Dec 2016**	Complete	
Procedure Changes Active	**Mar 2017**	Complete	
Phase 1 Unit 2 Training			
Training Complete	**Dec 2016**	Complete	

Phase 1 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Phase 1 Unit 2 Completion			
Unit 2 HCVS Phase 1 Implementation	**Mar 2017**	Complete	
Phase 1 Unit 1 Modifications			
Begin Conceptual Design	**Jun 2014**	Complete	
Complete Conceptual Design	**Jun 2014**	Complete	
Begin Detailed Design	**Jun 2015**	Complete	
Complete Detailed Design and Issue Modification Package	**Mar 2017**	Complete	Aug 2017
Begin Online Installation	**May 2017**	Complete	
Complete Online Installation	**Feb 2018**	Complete	Dec 2017
Begin Outage Installation	**Feb 2018**	Complete	
Complete Outage Installation and put system into service	**Mar 2018**	Complete	
Phase 1 Unit 1 Procedure Changes			
Operations Procedures Developed	**Dec 2017**	Complete	
Maintenance Procedures Developed	**Dec 2017**	Complete	
Procedure Changes Active	**Mar 2018**	Complete	

Phase 1 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Phase 1 Unit 1 Training			
Training Complete	**Dec 2017**	Complete	
Phase 1 Completion			
Phase 1 Unit 1 Implementation	**Mar 2018**	Complete	

Phase 2 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Phase 2 Unit 1 Modifications			
Begin Conceptual Design	**Jun 2015**	Complete	
Complete Conceptual Design	**Jun 2015**	Complete	
Begin Detailed Design	**Jun 2016**	Complete	Completed Mar 2017 due to Phase 1 detailed design and installation
Complete Detailed Design and Issue Modification Package	**Mar 2017**	Complete	Aug 2017
Begin Online Installation	**May 2017**	Complete	Sep 2017
Complete Online Installation	**Feb 2018**	Complete	Nov 2017
Begin Outage Installation	**Feb 2018**	N/A	No outage work required

Phase 2 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Complete Outage Installation and put system into service	**Mar 2018**	N/A	No outage work required
Phase 2 Unit 1 Procedure Changes			
Operations Procedures Developed	**Dec 2017**	Complete	
Maintenance Procedures Developed	**Dec 2017**	Complete	
Procedure Changes Active	**Mar 2018**	Complete	Dec 2017
Phase 2 Unit 1 Training			
Training Complete	**Dec 2017**	Complete	Oct 2017
Phase 2 Unit 1 Completion			
Phase 2 Unit 1 Implementation	**Mar 2018**	Complete	
Phase 2 Unit 2 Modifications			
Begin Conceptual Design	**Jun 2015**	Complete	
Complete Conceptual Design	**Jun 2015**	Complete	
Begin Detailed Design	**Jun 2017**	Complete	Sep 2017
Complete Detailed Design and Issue Modification Package	**Mar 2018**	Complete	Apr 2018
Begin Online Installation	**May 2018**	Not Started	Aug 2018

Phase 2 Specific Milestones			
Milestone	**Target Completion Date**	**Activity Status**	**Comments**
Complete Online Installation	**Feb 2019**	Not Started	
Begin Outage Installation	**Feb 2019**	N/A	No outage work required
Complete Outage Installation and put system into service	**Mar 2019**	N/A	No outage work required
Phase 2 Unit 2 Procedure Changes			
Operations Procedures Developed	**Dec 2018**	Started	
Maintenance Procedures Developed	**Dec 2018**	Not Started	
Procedure Changes Active	**Mar 2019**	Not Started	
Phase 2 Unit 2 Training			
Training Complete	**Dec 2018**	Started	
Phase 2 Completion			
Phase 2 Unit 2 Implementation	**Mar 2019**	Not Started	

4 Changes to Compliance Method

1. Rather than "as close as possible" (Ref. 7, pg. 14), the PCIVs will be located "as close as reasonably possible" (Ref. 3, Sec. 4.1.2.1.2) to the penetration into primary containment. (Ref. 9, dwg. M-959 Sht. 4; Ref. 12, dwg. M-859 Sht. 4)
2. The motive gas supply to the PCIVs will be nitrogen, not argon. (Ref. 7, pg. 10 & 15; Ref. 9 & 12, Design Considerations Summary [DCS] 4.1.33)

3. Downstream of the outboard PCIV, the piping classification changes from Safety Related to Non-Safety Related and Seismically Supported (i.e., Augmented Quality) (including the rupture disc). This is similar to safety classification changes for the existing Containment Vent & Purge System where piping downstream of the outboard PCIV is Non-Safety Related and Seismically Supported and then penetrates through Secondary Containment. This includes the argon and nitrogen tubing. (Ref. 7, pg. 17; Ref. 9 & 12, DCS 4.1.4.2)
4. HCVS leak-off path isolation will be via pilot-operated 2-way valve located in the Reactor Building. The pneumatic pilot taps into the nitrogen supply to the upstream PCIV actuator, closing the leak-off pathway simultaneously with opening the upstream PCIV. Thus, it will not require separate manual action. From Table 2-1 of Reference 7 (pg. 10), Primary Action 2 is combined with opening the upstream PCIV and inserted between Primary Actions 4 and 5 in sequence, prior to breaching the rupture disc with argon. Primary Action 6 will be reduced to opening and closing the downstream PCIV to cycle the vent. (Ref. 9, dwg. M-138 Sht. 3; Ref. 12, dwg. M-92 Sht. 4)
5. Radiation shielding for the FLEX pump or generator deployment locations is not required; the dose rates at the FLEX pump deployment locations are low enough for personnel habitability without shielding, and the FLEX generators are relocated to take advantage of shielding provided by the Reactor Building, itself. (Ref. 7, pg. 28; procedure LOA-FSG-002 Rev. 8, Atts. B1, B2, & I; calculation L-004151 Rev. 1)
6. The argon and nitrogen gas bottles will be normally isolated at the bottle stop valves. This is a change from Reference 7, which indicated that the bottles would be valved-in. However, the additional time required will be minimal and is achievable within the established event timeline. (Ref. procedures LGA-VQ-102 Rev 1 and LGA-VQ-202 Rev 3.)

7. Per NEI 13-02 Rev. 1, Section 6.2.4, valves that change position to establish the SAWA flow path need to be cycled once per operating cycle to verify functionality of the valves. At LaSalle there are both manual and motor-operated valves which meet this criterion; the MOVs meet the requirement as part of the safety related MOV Program. Per Exelon Preventive Maintenance (PM) template, manual valves installed in mild service conditions need to be cycled every 8 years for design basis PM requirements. Per Exelon's engineering judgment, cycling the manual valves to follow design basis requirements is sufficient for BDBEE systems/programs, such as SAWA. The FLEX Program also follows design basis PM requirements for valve cycling/maintenance. No new failure modes or degradation mechanisms are expected for BDBEE systems/programs which are different from design basis. Following this approach, valves that are outside of HCVS Phase 2 modification scope, but still required to change position for SAWA, do not need to be cycled prior to order compliance as long as they are cycled following design basis PM requirements. However, valves within the HCVS Phase 2 modification scope are cycled in accordance with post-maintenance test requirements.

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

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

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

The following tables provide a summary of the open items documented in the combined Phases 1 and 2 Overall Integrated Plan or the Interim Staff Evaluation (ISE) and the status of each item.

Combined Phases 1 and 2 OIP Open Items		Status
Phase 1 Open Items		
7	Perform radiological evaluation for Phase 1 vent line impact on ERO actions.	Complete. LaSalle calculation L-004151 determines peak dose rates at FLEX and HCVS Phase 2 activity locations. Adjustments have been made to either the timing or location of actions to manage dose below 5 REM to any individual performing ERO actions in most cases, with a small number of actions potentially greater than 5 REM, but not exceeding 10 REM. The estimated dose is based on peak dose rates from LaSalle calculation L-004151, determined from a combination of all source term locations, and is a very conservative estimate. There is considerable margin to the maximum emergency response exposure guideline of 25 REM to any one individual performing ERO actions. L-004151 Rev. 1 is available on ePortal.

Combined Phase 1 and 2 OIP Open Items		Status
Phase 2 Open Items		
1	Evaluate feasibility of strategy due to radiological conditions.	Complete. LaSalle calculation L-004151 indicates that the affected Reactor Building (RB) will be uninhabitable 1 hour after the ELAP due to core damage. As a result, the hose connection point on elevation 710' will be relocated from the RB to the Diesel Corridor, and order of activities changed so that the hose connections on elevation 761' in the RB are made within the first hour after the ELAP. Should electrical load shedding in the RB occur prior to elevated radiation levels rendering the building uninhabitable, LOA-FSG-002 is adjusted so that SAWA/SAWM required loads remain switched on. Dose rates at the FLEX/SAWA pump location are low enough that additional shielding is not required. Refueling strategies and other exterior actions will be adjusted as necessary based on actual event conditions. L-004151 Rev. 1 and LOA-FSG-002 Rev. 8 are available on ePortal.

Combined Phase 1 and 2 OIP Open Items		Status
Phase 2 Open Items		
2	Verify required modifications to support SAWA/SAWM.	Complete. The primary FLEX water strategy RB connection point is relocated into the Diesel Corridor, a safety related and missile protected structure outside of the RB, to support SAWA/SAWM when the radiation levels inside the RB render it uninhabitable due to fuel damage. The only other required modification is to construct the SAWA flow meter rig, which is mounted on a portable cart and stored in the Diesel Corridor. The flow meter is connected in-line with the FLEX water strategy hose downstream of a wye fitting where flow to the SFP splits off so the flow meter measures only RPV injection flow. Refs. 13 & 14 are available on ePortal.

No.	Phase 1 Interim Staff Evaluation Open Item	Status
1	Make available for NRC staff audit documentation of a method to disable HCVS during normal operation to provide assurances against inadvertent operation that also minimizes actions to enable HCVS operation following an ELAP.	Complete. The motive and purge gas systems will be isolated by at least one locked-closed manual valve in each system during normal operation. Main Control Room (MCR) controls will be via key-locked switches with power normally de-energized. PCIVs are gas-to-open, spring/fail closed. Ref. 9 & 12 (DCS 4.1.19, 4.1.33, 4.1.35, 4.1.36) and procedures LGA-VQ-102 Rev 1 & LGA-VQ-202 Rev 3 provide direction for these actions and are available on ePortal.

No.	Phase 1 Interim Staff Evaluation Open Item	Status
2	Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.	Complete. Calculation L-004114 performs the sizing evaluation of the common HCVS batteries and associated charger. The results show a margin of approximately 7% after 24 hours with all Unit 1 and Unit 2 HCVS loads drawing maximum current. The FLEX DG loading evaluations in ECs 396062 (DCS 4.1.35) and 396069 (DCS 4.1.35) show a margin on the more limited DG of 337 amps for future loads. The HCVS battery charger rated input current is 8 amps per Ref. 9 (DCS 4.1.35). Therefore, there is sufficient margin in either FLEX DG to power the HCVS battery charger. L-004114 Rev. 0, the DCSs of ECs 396062 and 396069, and Ref. 9 & 12 are available on ePortal.
3	Make available for NRC staff audit documentation of the HCVS argon pneumatic system design including sizing and location.	Complete. Pneumatic system motive force changed to nitrogen; see Section 4 of this document, Ref. 9 & 12 (DCS 4.1.33), and calculations L-004117 and L-004184. L-004117 Rev. 1, L-004184 Rev. 0, and Ref. 9 & 12 are available on ePortal.

No.	Phase 1 Interim Staff Evaluation Open Item	Status
4	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. The radiological evaluation in calculation L-004115 and temperature evaluations in Ref. 9 & 12 (DCS 4.1.14) show no additional shielding or high temperature mitigation is required to safely access and operate controls and equipment. Ref. 9 provides a conservative maximum temperature for the ROS in DCS Section 4.1.14. A "toolbox" approach will be used by the operators as necessary for extreme temperature conditions (e.g., ice vests, small portable fans, etc.) per procedure LOA-FSG-005. LOA-FSG-005 Rev. 5, L-004115 Rev. 3, and Ref. 9 & 12 are available on ePortal.
5	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. Calculations L-004097 and L-004149 show that the HCVS has the capacity to vent the steam/energy equivalent of 1% of rated thermal power while maintaining containment pressure below containment design pressure and PCPL. L-004097 Rev. 4 and L-004149 Rev. 1 are available on ePortal.

No.	Phase 1 Interim Staff Evaluation Open Item	Status
6	Make available for NRC staff audit the seismic and tornado missile final design criteria for the HCVS stack.	Complete. LaSalle design complies with the reasonable tornado protection criteria of Reference 6. The seismic and tornado missile protection design is described in Ref. 9 & 12 (DCS 4.1.38) and evaluated in calculation L-004092. Ref. 9 & 12 and L-004092 Revs. 2 and 2A are available on ePortal.
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 devices, etc.) required for HCVS venting including confirmation that the components are capable of performing their functions during ELAP and severe accident conditions.	Complete. Ref. 9 & 12 (DCS 4.1.14) include the temperature and humidity evaluations and calculation L-004115 evaluates the radiological conditions. Ref. 9 & 12 and L-004115 Rev. 3 are available on ePortal.
8	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. FLEX communications strategies and equipment (as described in procedure LOA-FSG-010) will be utilized for HCVS. These methods are adequate for HCVS implementation. LOA-FSG-010 Rev. 3 is available on ePortal.

No.	Phase 1 Interim Staff Evaluation Open Item	Status
9	Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration.	Complete. An argon purge system is provided which is designed to purge the vent piping of a detonable mixture of hydrogen and oxygen after each vent cycle. Installed capacity is provided for the first 24 hours after ELAP, and additional argon bottles are stored in a FLEX building to continue operation past 24 hours. Calculations L-004137 Rev. 0 & 0A & L-004185 Rev. 0 & 0A and Ref. 9 & 12 (DCS 4.1.33) are available on ePortal.
10	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. LaSalle's wetwell vent line has a dedicated HCVS flowpath from the wetwell penetration to the outside with no interconnected system. The discharge point meets the guidance of HCVS-FAQ-04 (Att. J of Reference 3). See Ref. 9 (dwgs. M-138 Sht. 3 & M-959 Sht. 4) and Ref. 12 (dwgs. M-92 Sht. 4 & M-859 Sht. 4), available on ePortal.

<table>
<tr><th>No.</th><th>Phase 1 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td>11</td><td>Make available for NRC staff audit documentation of a seismic qualification evaluation of HCVS components.</td><td>Complete. See calculations L-003953, L-004138 through L-004146, L-004161 through L-004166.

All calculations are available on ePortal:

L-003953 Rev. 1B
L-004138 Rev. 0
L-004139 Rev. 0 and 0A
L-004140 Rev. 1
L-004141 Rev. 0 and 0A
L-004142 Rev. 0 and 0A
L-004143 Rev. 0 and 0A
L-004144 Rev. 0 and 0A
L-004145 Rev. 0 and 0A
L-004146 Rev. 0 and 0A
L-004161 Rev. 0 and 0A
L-004162 Rev. 0 and 0A
L-004163 Rev. 0 and 0A
L-004164 Rev. 0 and 0A
L-004165 Rev. 0 and 0A
L-004166 Rev. 1</td></tr>
<tr><td>12</td><td>Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.</td><td>Complete.

New instrumentation and controls are described in Ref. 9 &12 (DCS 4.1.36), and qualification methods are per calculations shown in the table, below.

<table>
<tr><th>New Instruments</th><th><u>Qualification Method</u>
Reference Calculations</th></tr>
<tr><td>HCVS Temperature:
1(2)TE-PC310
1(2)TT-PC311</td><td><u>IEEE 344-1975/1987</u>
L-004161
L-004166</td></tr>
<tr><td>HCVS Radiation:
1(2)RE-PC320
1(2)RT-PC321</td><td><u>IEEE 344-1975</u>
L-004139
L-004166</td></tr>
<tr><td>HCVS PCIV Position Indication</td><td><u>IEEE 344-1975</u>
L-004140</td></tr>
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<table>
<tr><th>No.</th><th>Phase 1 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>HCVS Pneumatic Supply Pressure: 1(2)PI-PC450</td><td>IEEE 344-1975
L-004143</td></tr>
<tr><td>HCVS Purge Supply Pressure:
1(2)PI-PC545
1(2)PT-PC546</td><td>IEEE 344-1975
L-004143
L-004141</td></tr>
<tr><td>HCVS Electrical Supply Availability: 0DC51E</td><td>IEEE 344-1975
L-004138</td></tr>
<tr><td>HCVS Controls:
0PM08J
manual valves</td><td>IEEE 344-1975
L-004146
L-004143</td></tr>
</table>
Existing instruments relied upon for initiation, operation, and monitoring of HCVS are qualified or evaluated to Regulatory Guide 1.97 and include the following: Drywell pressure (1(2)PI-CM029), Wetwell pressure (1(2)PI-CM056), Wetwell level (1(2)LI-CM192), Wetwell water temperature (1(2)TI-CM037), and Reactor pressure (1(2)C61-R011). (Ref. 9 & 12, DCS 4.1.14)

All referenced documents are available on ePortal.
</td></tr>
<tr><td>13</td><td>Make available for NRC staff audit the procedures for HCVS operation.</td><td>Complete. Procedures LGA-VQ-102 Rev 1, LGA-VQ-202 Rev 3, LOP-PC-08 Rev 3, and LOP-PC-09 Rev 6 contain all instructions for operation of the HCVS.

Above procedures are available on ePortal.</td></tr>
</table>

No.	Phase 2 Interim Staff Evaluation Open Item	Status
1	Licensee to confirm through analysis the temperature and radiological conditions to ensure that operating	Complete. Actions taken within the first hour (prior to start of core damage) from the start of the ELAP are acceptable from an environmental and

No.	Phase 2 Interim Staff Evaluation Open Item	Status
	personnel can safely access and operate controls and support equipment. (ISE Section 3.3.1)	radiological perspective without further evaluation. Actions performed within the MCR are acceptable for the entire period of Sustained Operation per HCVS-FAQ-06 Assumption 049-21. Actions outside of the MCR are performed at the Remote Shutdown Panel (in the Aux Electric Equipment Room/AEER), in the Diesel Generator Building Corridors, and outside of the Diesel Corridors to the north and south of the Reactor Building. AEER access was addressed in the response to Order EA-12-049 and actions follow procedure LOA-FSG-005. The Diesel Corridor and outside areas have no significant heat loads during an ELAP and will not experience extreme temperatures. However, should high temperatures be encountered, a "toolbox" approach will be used by the operators as necessary (e.g., ice vests, small portable fans, etc.) per procedure LOA-FSG-005. For actions within the Reactor Building and between 1 and 7 hours, a quantitative evaluation of expected dose rates has been performed per HCVS-FAQ-12 and found the dose rates at deployment locations including ingress/egress paths are acceptable. See calculation L-004151. Note that no actions in the Reactor Building are planned for the unit in a severe accident after the first hour post-ELAP. For ingress and egress paths outside the Reactor Building between 7 hours and 7 days, when SAWA is being utilized, a quantitative

No.	Phase 2 Interim Staff Evaluation Open Item	Status
		evaluation of expected dose rates has been performed per HCVS-WP-02 and found the dose rates at deployment locations including ingress/egress paths are acceptable. See L-004151. Cautions will be added to procedures to provide guidance for high dose rate areas to minimize dose. LOA-FSG-005 Rev. 5 and L-004151 Rev. 1 are available on ePortal.
2	Licensee to evaluate the ingress and egress paths for the expected severe accident conditions (temperature, humidity, radiation) for the sustained operating period. (ISE Section 3.3.2.3)	Complete. The location of SAWA equipment and controls, including ingress and egress paths, will be the same or similar as FLEX and will be bounded by the FLEX evaluations for temperature and humidity. See the response to Phase 2 ISE Open Item #1 for radiation.

No.	Phase 2 Interim Staff Evaluation Open Item	Status
3	Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a DW vent during severe accident conditions. (ISE Section 3.3.3)	Complete. The wetwell vent has been designed to meet NEI 13-02 Rev. 1 guidance, which will ensure 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. LaSalle will follow the guidance (flow rate and timing) for SAWA/SAWM described in BWROG-TP-15-008 and BWROG-TP-15-011. These documents have been posted to the ePortal for NRC staff review. The wetwell vent will be opened prior to exceeding the PCPL value of 60 PSIG. Therefore, containment over-pressurization is prevented without the need for a drywell vent.

<table>
<tr><th>No.</th><th>Phase 2 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td>4</td><td>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 DW vent is needed. (ISE Section 3.3.3.1)</td><td>Complete.

<table><tr><th>Reference Plant</th><th>LaSalle</th></tr><tr><td>Torus freeboard volume is 525,000 gallons</td><td>Suppression chamber free volume is at least 1.23 million gallons</td></tr><tr><td>SAWA flow is 500 GPM at 8 hr followed by 100 GPM from 12 hr to 168 hr</td><td>SAWA flow is 500 GPM at 8 hr followed by 100 GPM from 12 hr to 168 hr</td></tr><tr><td colspan="2">The above parameters for LaSalle compared to the reference plant that determines success of the SAWM strategy demonstrate that the reference plant values are bounding. Therefore, the SAWM strategy implemented at LaSalle makes it unlikely that a DW vent is needed to prevent containment overpressure related failure.
Reference LaSalle UFSAR Table 6.2-1 for suppression chamber volume. Ref. 13 & 14 (DCS 4.1.19, 4.1.33 & Table 3) contain SAWA/SAWM flow rates. UFSAR Table 6.2-1, Ref. 13 & 14 are available on ePortal.</td></tr></table></td></tr>
<tr><td>5</td><td>Licensee to demonstrate that there is adequate communication between the MCR and the operator at the FLEX pump during severe accident conditions. (ISE Section 3.3.3.4)</td><td>Complete.

LaSalle utilizes handheld radios in the talk-around mode to communicate between the MCR and the operator at the FLEX pump. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remained powered using the same methods as evaluated under EA-12-049 for the period of sustained operation, which may be longer than identified for EA-12-049.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Phase 2 Interim Staff Evaluation Open Item</th><th>Status</th></tr>
<tr><td>6</td><td>Licensee to demonstrate the SAWM flow instrumentation qualification for the expected environmental conditions. (ISE Section 3.3.3.4)</td><td>Complete.

For locations outside the Reactor Building between 7 hours and 7 days when SAWA is being utilized, a quantitative evaluation of expected dose rates has been performed per HCVS-WP-02 and found the dose rates at deployment locations including ingress/egress paths are acceptable (Ref. calculation L-004151, available on ePortal). The selected instrument is designed for the expected flow rate, temperature and pressure for SAWA over the period of sustained operation (Ref. 13 & 14, DCS 4.1.14). Ref. 13 & 14 are available on ePortal.
<table>
<tr><th>SAWA Flow Instrument Qualification</th><th>Expected SAWA Parameter Range</th></tr>
<tr><td>3.30 - 1100 gpm</td><td>100 - 500 gpm</td></tr>
<tr><td>-4 to 140 °F</td><td>48 to 140 °F</td></tr>
<tr><td>0 to 285 psi</td><td>0 to 250 psi</td></tr>
</table>
</td></tr>
</table>

7 Interim Staff Evaluation Impacts

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

8 References

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

1. LaSalle'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)," dated June 30, 2014 (Accession No. ML14184A016).
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 (Accession No. ML13143A321).

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. Industry White Paper HCVS-WP-04, “Missile Evaluation for HCVS Components 30 Feet Above Grade,” Revision 0, dated August 17, 2015
7. LaSalle’s “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 16, 2015 (Accession No. ML15352A109).
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. Engineering Change EC 392353, “U2 Hardened Containment Vent System (HCVS).” Revision 5 approved 2/24/17.
10. NRC “Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109,” dated March 31, 2015.
11. NRC “Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109,” dated August 2, 2016.
12. Engineering Change EC 397691, “U1 Hardened Containment Vent System (HCVS).” Revision 2 approved 1/12/18.
13. Engineering Change EC 618667, “U1 Hardened Containment Vent System (HCVS) Phase 2.” Revision 0 approved August 18, 2017.
14. Engineering Change EC 620478, “U2 Hardened Containment Vent System (HCVS) Phase 2.” Revision 0 approved April 26, 2018.