Exelon Generation

JAFP-17-0116
RS-17-151

Order EA-13-109

December 15, 2017

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

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

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

References:

1. NRC Order Number EA-13-109, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013
2. NRC Interim Staff Guidance JLD-ISG-2013-02, "Compliance with Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions", Revision 0, dated November 14, 2013
3. NRC Interim Staff Guidance JLD-ISG-2015-01, "Compliance with Phase 2 Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions", Revision 0, dated April 2015
4. NEI 13-02, "Industry Guidance for Compliance With Order EA-13-109, BWR Mark I & II Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions", Revision 1, dated April 2015
5. James A. FitzPatrick Nuclear Power Plant 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 (JAFP-14-0075)
6. James A. FitzPatrick Nuclear Power Plant 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 29, 2015 (JAFP-15-0149)
7. NRC letter to James A. FitzPatrick Nuclear Power Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents), dated February 12, 2015
8. NRC letter to James A. FitzPatrick Nuclear Power Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents), dated December 16, 2016

On June 6, 2013, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an Order (Reference 1) to James A. FitzPatrick Nuclear Power Plant (JAF). Reference 1 was immediately effective and directs JAF to take certain actions to ensure that JAF has 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 JAF Phase 1 OIP pursuant to Section IV, Condition D.1 of Reference 1. Reference 6 provided the JAF Phase 1 updated and Phase 2 OIP pursuant to Section IV, Conditions D.2 and D.3 of Reference 1.

The purpose of this letter is to provide the seventh 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 JAF. 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 7 and 8.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of December 2017.

Respectfully submitted,

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

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

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator – Region I
NRC Senior Resident Inspector – James A. FitzPatrick Nuclear Power Plant
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RS-17-151 / JAFP-17-0116
Enclosure

James A. FitzPatrick Nuclear Power Plant

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

(21 pages)

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

1 Introduction

JAF developed a Phase 1 Overall Integrated Plan (Reference 2) and a Phase 2 Overall Integrated Plan (Reference 3), documenting the installation of a Hardened Containment Vent System (HCVS) that provides a reliable hardened venting capability in response to NRC Order Number EA-13-109 (Reference 1). This enclosure provides an update of milestone accomplishments since submittal of the Phase 1 Overall Integrated Plan, Phase 2 Overall Integrated Plan, and the subsequent Six Month Status Reports, 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 Phase 1 Overall Integrated Plan (Reference 2) and Phase 2 Overall Integrated Plan (Reference 3), and are current as of December 1, 2017. (See Section 3)

- Phase 2 Design Engineering On-site/Complete
- Submitted 7th Six-Month Status Report by letter RS-17-151 / JAFP-17-0116

3 Milestone Schedule Status

The following provides an update to Part 5 of the Phase 1 Overall Integrated Plan (Reference 2) and Part 5 of the Phase 2 Overall Integrated Plan (Reference 3). It provides the 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.

JAF - Phase 1 and Phase 2 Specific Milestone Schedule

Milestone	Target Completion Date	Activity Status	Comments
Phase 1			
Hold preliminary / conceptual design meeting	Jan 2014	Complete	
Submit Overall Integrated Implementation Plan	Jun 2014	Complete	
Submit 6 Month Status Report	Dec 2014	Complete	
Submit 6 Month Status Report	Jun 2015	Complete	
Design Engineering On-site/Complete	Dec 2015	Complete	
Submit 6 Month Status Report	Dec 2015	Complete	
Submit 6 Month Status Report	Jun 2016	Complete	
Submit 6 Month Status Report	Dec 2016	Complete	
Submit 6 Month Status Report	Jun 2017	Complete	

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

Milestone	Target Completion Date	Activity Status	Comments
Submit 6 Month Status Report	Dec 2017	Complete with this Submittal	
Operations Procedure Changes Developed	April 2018	Started	
Site Specific Maintenance Procedure Developed	April 2018	Started	
HCVS Implementation Complete	May 2018	Started	
Procedure Changes Active	Jun 2018	Not Started	
Walk Through Demonstration/Functional Test	Jun 2018	Not Started	
Training Complete	Jun 2018	Started	
HCVS Phase 1 Compliance	Jun 2018	Not Started	
Submit Completion Report	Nov 2018	Not Started	
Phase 2			
Hold preliminary/conceptual design meeting	Oct 2015	Complete	
Submit Overall Integrated Implementation Plan	Dec 2015	Complete	
Submit 6 Month Status Report	Jun 2016	Complete	
Submit 6 Month Status Report	Dec 2016	Complete	
Submit 6 Month Status Report	Jun 2017	Complete	
Design Engineering On-site/Complete	Oct 2017	Complete	
Submit 6 Month Status Report	Dec 2017	Complete with this submittal	
Operations Procedure Changes Developed	Jun 2018	Started	
Site Specific Maintenance Procedure Developed	Jun 2018	Started	
Training Complete	Jun 2018	Started	
Submit 6 Month Status Report	Jun 2018	Not Started	
Implementation Outage	Sep 2018	Not Started	
Walk Through Demonstration/Functional Test	Sep 2018	Not Started	
Procedure Changes Active	Sep 2018	Not Started	

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

Milestone	Target Completion Date	Activity Status	Comments
Submit Completion Report	Nov 2018	Not Started	

4 Changes to Compliance Method

The JAF design changes to the HCVS will continue to meet the requirements of Order EA-13-109 (Reference 1). There are clarifications to the information presented in the JAF HCVS OIPs based on the final detailed design. The following clarifications are described based on the applicable sections in the Overall Integrated Plan.

Phase 1

There is no change to the compliance method that meets NEI 13-02 (Reference 4).

Phase 2

All updates below are a part of the Phase 2 Overall Integrated Plan (Reference 3), Part 3.1: Boundary Conditions for SAWA:

Table 3.1 – SAWA Manual Actions

Step 2 - The existing LPCI 'B' train batteries will be used to open 27MOV-25B from the Main Control Room. Therefore, the Control Building is also considered a Primary Location for this action.

Step 3 – Load shedding is required in the Turbine and Administration Building as part of repowering plant components via the FLEX Diesel Generator (DG); therefore, the Turbine/Administration Building are also considered Primary Locations for this action.

Severe Accident Operation, Table 3.1.B, Greater than 24 Hour Coping Detail; Attachment 1; Attachment 3 Sketch 1, 3 & 4 (A/B)

The SAWA injection pathway has been updated to use the RHR 'B' train rather than the RHR 'A' train as reflected in the Phase 2 OIP (Sketch 1 is updated below to reflect this change). This update, resulting from the final detailed design, yields a strategy with less operator actions. A new common FLEX/SAWA cart mounted throttling valve and flow meter will be installed between valves 10RHR-460 and 76FPS-780. This throttling valve will be used to adjust flow rate, as needed. Resulting from this change, the credited ECCS check valve is 10AOV-68B. The following valves require modulation:

- 10MOV-148B (Manual Open)
- 10MOV-149B (Manual Open)
- 10MOV-25B (LPCI Batteries)
- 76FPS-807 (Manual Close)
- 76FPS-780 (Manual Open)
- 10RHR-460 (Manual Open)

It is noted that 10MOV-27B is normally open and 10RHR-11B no longer requires closing as it is a system dead leg.

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

Greater than 24 Hour Coping Detail (Instrumentation Table)

There are multiple instruments listed in support of the SAWA strategy. To clarify, the credited instruments for SAWA are:

- Drywell Pressure: 27PI-115A2
- Torus Water Level: 23LI-202A

Additional instrumentation may be available and is considered defense-in-depth.

In addition, due to this strategy update, the following portable equipment (OIP Attachment 1) is revised/new for this update:

List Portable Equipment	BDBEE Venting	Severe Accident Venting	Performance Criteria	Maintenance / PM Requirements
4" Hose (140')*	X	X	-	Per Response to EA-12-049
Throttling Valve**	X	X	361 gpm minimum	Per NEI 13-02 and EA-12-049

*Revised
**New

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

On January 9, 2017, JAF received approval for an extension until June 30, 2018, to comply with requirements for implementation of Phase 1 (wetwell) vent at JAF (Reference 9). JAF expects to comply with the Phase 2 order implementation date and no relief/relaxation for Phase 2 is required at this time.

6 Open Items from Overall Integrated Plan and Interim Staff Evaluation

The following tables provide a summary of the open items documented in the Phase 1 and Phase 2 Overall Integrated Plan, the Reference 7 Interim Staff Evaluation (ISE) for Phase 1 and Reference 8 ISE for Phase 2, and the status of each item.

Open Item	Phase 1 Open Items from OIP	Status
	None	

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

Open Item	Phase 1 Interim Staff Evaluation (ISE) Open Items	Description	Status
1.	Make available for NRC staff audit analyses demonstrating that HCVS has the capacity to vent the steam/energy equivalent of one (1) 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.	JAF is capable of (a) venting the equivalent of (1) percent of licensed/rated thermal power and (b) the Torus is capable of absorbing the decay heat for the first three hours to maintain the integrity of primary containment. Auditable analyses to justify the capability of the Torus, as described in this action, have been issued as calculation JAF-CALC-14-00015 (part of the approved design change package EC 52721) and calculation JAF-CALC-15-00026 (part of the approved design change package EC 58158). For additional discussion, see EC 52721 Topic Notes Section 3.1.7 entitled "Hydraulic Requirements". References have been provided on the ePortal.	Complete
2.	Make available for NRC staff audit the seismic and tornado missile final design criteria for the HCVS stack.	The Hardened Containment Vent System (HCVS) piping from the Torus to the discharge above the Reactor Building (RB) Roof is designed to be seismically rugged as supported by calculations JAF-CALC-14-00017, JAF-CALC-15-00008, JAF-CALC-15-00033, and JAF-CALC-14-00016 (part of the approved design change package EC 52721). Protection from tornado missiles is acceptable in accordance with evaluations based on the HCVS-WP-04 guidance. See EC 52721 Topic Notes Section 3.1.3 entitled "Structural Requirements". Specifically, see the associated subsection entitled "Tornado Missiles". References have been provided on the ePortal.	Complete

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

Open Item	Phase 1 Interim Staff Evaluation (ISE) Open Items	Description	Status
3.	Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.	The HCVS Battery System will support a minimum of 24 hours of operation. Refer to EC 52721 Topic Notes, Section 3.1.4 entitled "Electrical Requirements." Specifically, refer to the subsections entitled "Battery Selection and Sizing," "Battery Charger Selection and Sizing," and the associated Engineering Change (EC) attachment, P2e Sequence No. 6.003. The HCVS battery load has been incorporated into the FLEX Diesel Generator (DG) via approved EC 52736 (FLEX Strategy) and associated calculation JAF-CALC-15-00031. References have been provided on the ePortal.	Complete
4.	Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.	The HCVS pneumatic system design sizing will be capable of 12 cycles in the first 24 hours. The sizing of the nitrogen motive force and purge systems is provided in calculations JAF-CALC-15-00013 and JAF-CALC-15-00038, respectively (part of the approved design change package EC 52721). For additional discussion, see EC 52721 Topic Notes Section 3.1.6.3 entitled "Cross Flow & Hydrogen Detonation". Specifically, see the associated subsection entitled "HCVS Pipeline Protection". References have been provided on the ePortal.	Complete
5.	Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration.	The JAF strategy for preventing hydrogen detonation and deflagration beyond the final isolation point (valve) is a nitrogen purge system. Concurrent with closing the isolation valve, the purge system will be initiated to purge the vented fluid from the HCVS pipeline. For additional discussion, see EC 52721 Topic Notes Section 3.1.6.3 entitled "Cross Flow & Hydrogen Detonation". Specifically, see the associated subsection entitled "HCVS Pipeline Protection". References have been provided on the ePortal.	Complete

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

Open Item	Phase 1 Interim Staff Evaluation (ISE) Open Items	Description	Status
6.	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.	At JAF, the interfaces between the RB and the HCVS pipeline are limited to normally closed, small bore drain and instrument valves minimizing the hydrogen gas migration and ingress into the Reactor Building. In addition, migration to the Standby Gas Treatment System is minimized through the use of existing Class VI Motor Operated Valves (MOVs) that have been leak tested in accordance with NEI 13-02. For additional discussion, see EC 52721 Topic Notes Section 3.1.6.3 entitled "Cross Flow & Hydrogen Detonation". Specifically, see the associated subsection entitled "Interconnecting Systems". References have been provided on the ePortal.	Complete
7.	Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	The required instrumentation and controls (existing and new) are identified as part of the JAF OIP, Part 2. The qualification of the equipment has been described within the approved design change package EC 52721; however, additional documentation must be supplied by vendors before this item is completed. Upon completion, the evaluations will be posted to ePortal.	Started
8.	Make available for NRC staff audit documentation of a seismic qualification evaluation of HCVS components.	The qualification of the equipment has been described within the approved design change package EC 52721; however, additional documentation must be supplied by vendors before this item is completed. Upon completion, the evaluations will be posted to ePortal.	Started

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

Open Item	Phase 1 Interim Staff Evaluation (ISE) Open Items	Description	Status
9.	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.	The approved design change package EC 52721 describes the conditions and capability of the equipment to function within the stated conditions. The qualification of the equipment has been described within the approved design change package EC 52721; however, additional documentation must be supplied by vendors before this item is completed. Upon completion, the evaluations will be posted to ePortal.	Started
10.	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 BDBEE and severe accident wetwell ventinq.	At JAF, the existing Primary Containment Isolation Valves (PCIVs) (27AOV-117 and -118) that will be part of the EA-13-109 HCVS flow path are currently a part of the Generic Letter (GL) 89-16 containment hardened pipe flow path. Calculation 14620.9011-US(N)-004 "Suppression Chamber (20") & Drywell (24") Vent & Purge Butterfly Valves based on RELAP 5/MOD2 56 psig and 62 psig Results" concludes the valves can be opened against the maximum expected differential pressure during an Order EA-13-109 event, the primary containment pressure limit of 62 psig. References have been provided on the ePortal.	Complete

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

Open Item	Phase 1 Interim Staff Evaluation (ISE) Open Items	Description	Status
11.	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.	JAF utilizes the site Ultra-High Frequency (UHF) security radio system (Ref. EC 53903) to communicate between the MCR and the operator at the HCVS control location. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remain powered using the same methods as evaluated under EA-12-049 for the period of sustained operation. References have been provided on the ePortal.	Complete
12.	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.	The approved design change package EC 52721, along with supporting calculations, has identified the anticipated conditions during ELAP and a Severe Accident and confirm the capability for operating personnel to safely access and operate controls and support equipment. For additional discussion, see EC 52721 Topic Notes Section 3.1.11.3 entitled "HCVS Manual Actions". References have been provided on the ePortal.	Complete

Open Item	Phase 2 Open Items from OIP	Status
1.	Complete hydraulic analysis of diesel fire pump for SAWA / SAWM flowrates	Complete. See Calculation JAF-CALC-17-00104 titled "HCVS Phase 2 SAWA Hydraulic Analysis" issued under the approved Engineering Change 620605. References have been provided on the ePortal.
2.	Identify and evaluate severe accident conditions for Phase 2 manual actions.	Complete. See Calculation JAF-CALC-14-00029 titled "Hardened Containment Vent System: Dose Assessment" and

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		Attachment 10.07 (Manual Actions Table) issued under approved Engineering Change 620605. References have been provided on the ePortal.
3.	The FLEX Engineering Change (EC 52736) has not been completed; therefore, any reference to this information is considered unverified.	Complete. See Engineering Change 52736. References have been provided on the ePortal.

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

Open Item	Phase 2 Interim Staff Evaluation (ISE) Open Items	Description	Status
1.	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.	Temperature and Humidity The location of SAWA equipment and controls including ingress and egress paths that are the same or similar as FLEX and are bounded by the FLEX evaluations for temperature and humidity (see EC 52736). Ingress and Egress Specific SAWA dose values are calculated in calculation JAF-CALC-14-00029 updated as part of EC 620605. For locations inside the Reactor Building between 1 and 7 hours when SAWA is being deployed, JAF has performed a quantitative evaluation of expected dose rates per HCVS-FAQ-12 and found the dose rates at deployment locations including ingress/egress paths are acceptable For locations outside the Reactor Building between 7 hours and 7 days when SAWA is being utilized, JAF has performed a quantitative evaluation of expected dose rates per HCVS-WP-02 and found the dose rates at deployment locations including ingress/egress paths are acceptable. Attachment 10.07 ("Manual Actions Table") to EC 620605 provides a list of SAWA manual actions along with the expected environmental conditions and associated operational limitations. References have been provided on the ePortal.	Complete

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

Open Item	Phase 2 Interim Staff Evaluation (ISE) Open Items	Description	Status
2.	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.	Equipment and Controls Plant instrumentation for SAWA that is qualified to RG 1.97 or equivalent is considered qualified for the sustained operating period without further evaluation. The following plant instruments are qualified to RG 1.97: • Drywell Pressure: 27PI-115A2 • Torus Water Level: 23LI-202A Passive components that do not need to change state after initially establishing SAWA flow do not require evaluations. The following additional equipment performing an active SAWA/SAWM function is considered for temperature and radiation effects: • SAWA/SAWM flow instrument • SAWA/SAWM pump (FLEX pump) • SAWA/SAWM generator (FLEX generator) • Active valves in SAWA flow path Temperature The location of SAWA equipment and controls that are the same or similar as FLEX will be bounded by the FLEX evaluations for temperature and humidity. A supplementary calculation (JAF-CALC-17-00105) was completed as part of the SAWA Engineering Change (EC 620605) to evaluate the temperature conditions local to flow meter during extreme cold conditions. See Phase 2 ISE OIP Item 5 for more information.	Complete

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

Open Item	Phase 2 Interim Staff Evaluation (ISE) Open Items	Description	Status
		(continued) Radiation Specific SAWA dose values are calculated in calculation JAF-CALC-14-00029 updated as part of EC 620605. For additional discussion, see EC 620605 Topic Notes Section 3.1.8 entitled "Instrumentation and Controls Characteristics" and 3.1.9 "Mechanical Requirements". Attachment 10.07 ("Manual Actions Table") to EC 620605 provides a list of SAWA expected environmental conditions. References have been provided on the ePortal.	
3.	Licensee to demonstrate that containment failure as a result of overpressure can be prevented without a drywell vent during severe accident conditions.	The wetwell vent has been designed and will be installed to meet NEI 13-02 Rev 1 guidance, which will ensure that it is adequately sized to prevent containment overpressure under severe accident conditions (Ref. JAF-CALC-14-00015). The SAWM strategy will ensure that the wetwell vent remains functional for the period of sustained operation. JAF will follow the guidance (flow rate and timing) for SAWA/SAWM described in BWROG-TP-15-008 and BWROG-TP-15-011. References have been provided on the ePortal.	Complete

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

<table>
<tr><th>Open Item</th><th>Phase 2 Interim Staff Evaluation (ISE) Open Items</th><th>Description</th><th>Status</th></tr>
<tr><td></td><td></td><td>The wetwell vent will be opened prior to exceeding the PCPL value of 62 PSIG. Therefore, containment over pressurization is prevented without the need for a drywell vent.

JAF is bounded by the reference plant analysis that shows the SAWM strategy is successful in making it unlikely that a drywell vent is needed as demonstrated by the following table. The values in this table are formalized in Attachment 6.004 to EC 620605.</td><td></td></tr>
<tr><td colspan="4">
<table>
<tr><th>Reference Plant</th><th>James A. FitzPatrick</th></tr>
<tr><td>Torus freeboard volume is 525,000[2] gallons</td><td>Torus freeboard volume is determined to be 813,012 gallons</td></tr>
<tr><td>SAWA flow is 500 GPM at 8 hours followed by 100 GPM from 12 hours to 168 hours</td><td>SAWA flow is 361 GPM at 8 hours followed by 73 GPM from 12 hours to 168 hours</td></tr>
<tr><td colspan="2">The above parameters for JAF compared to the reference plant that determine success of the SAWM strategy demonstrate that the reference plant values are bounding. Therefore, the SAWM strategy implemented at JAF makes it unlikely that a DW vent is needed to prevent containment overpressure related failure.</td></tr>
</table>
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[2] Peach Bottom available freeboard volume in gallons is estimated from nominal water level of 14.7 feet to 21 feet. 21 feet is the upper range of the wide range torus level instrument and the assumed loss of wetwell vent function. The Peach Bottom torus is 31 feet in diameter.

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

Open Item	Phase 2 Interim Staff Evaluation (ISE) Open Items	Description	Status
4.	Licensee to demonstrate that there is adequate communication between the primary HCVS operating station and the operator at the FLEX supply hose splitter valve during severe accident conditions.	JAF utilizes the site Ultra-High Frequency (UHF) security radio system (Ref. EC 53903) to communicate between the MCR and the operator at the SAWA/SAWM flow control location. This communication method is the same as accepted in Order EA-12-049. These items will be powered and remain powered using the same methods as evaluated under EA-12-049 for the period of sustained operation. References have been provided on the ePortal.	Complete

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

Open Item	Phase 2 Interim Staff Evaluation (ISE) Open Items	Description	Status
5.	Licensee to demonstrate the SAWA/SAWM flow instrumentation qualification for the expected environmental conditions.	JAF utilizes a four inch size Seametrics AG2000 flowmeter. The flow meter is deployed in the RHRSW 'B' / 'D' room which is part of the plant circulating water Screen House building. This room is located a substantial distance from the Hardened Containment Vent System (HCVS) vent line and is well shielded from the expected HCVS vent line dose. For locations outside the Reactor Building between 7 hours and 7 days when SAWA is being utilized, JAF performed a quantitative evaluation of equipment and deployment locations and confirmed they are protected by buildings with substantial shielding to minimize dose rates. Specific SAWA dose values are calculated in calculation JAF-CALC-14-00029 updated as part of EC 620605. Attachment 10.07 ("Manual Actions Table") to EC 620605 provides a list of SAWA expected environmental conditions. The selected instrument is designed for the expected flow rate, temperature and pressure for SAWA over the period of sustained operation. The instrument qualification for pressure, temperature and flow provided in the table below is from the product technical data. References have been provided on the ePortal.	Complete

SAWA Flow Instrument Qualification	SAWA Parameter Range
12-1,000 GPM	73 – 361 GPM
10 – 130°F Operating -40 – 158°F Storage	11 – 110°F Operating / Storage
0 – 150 PSI Working Pressure	0 – 148 psig

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

7 Interim Staff Evaluation Impacts

There are no potential impacts to the Phases 1 or 2 Interim Staff Evaluations (References 7 and 8) identified at this time.

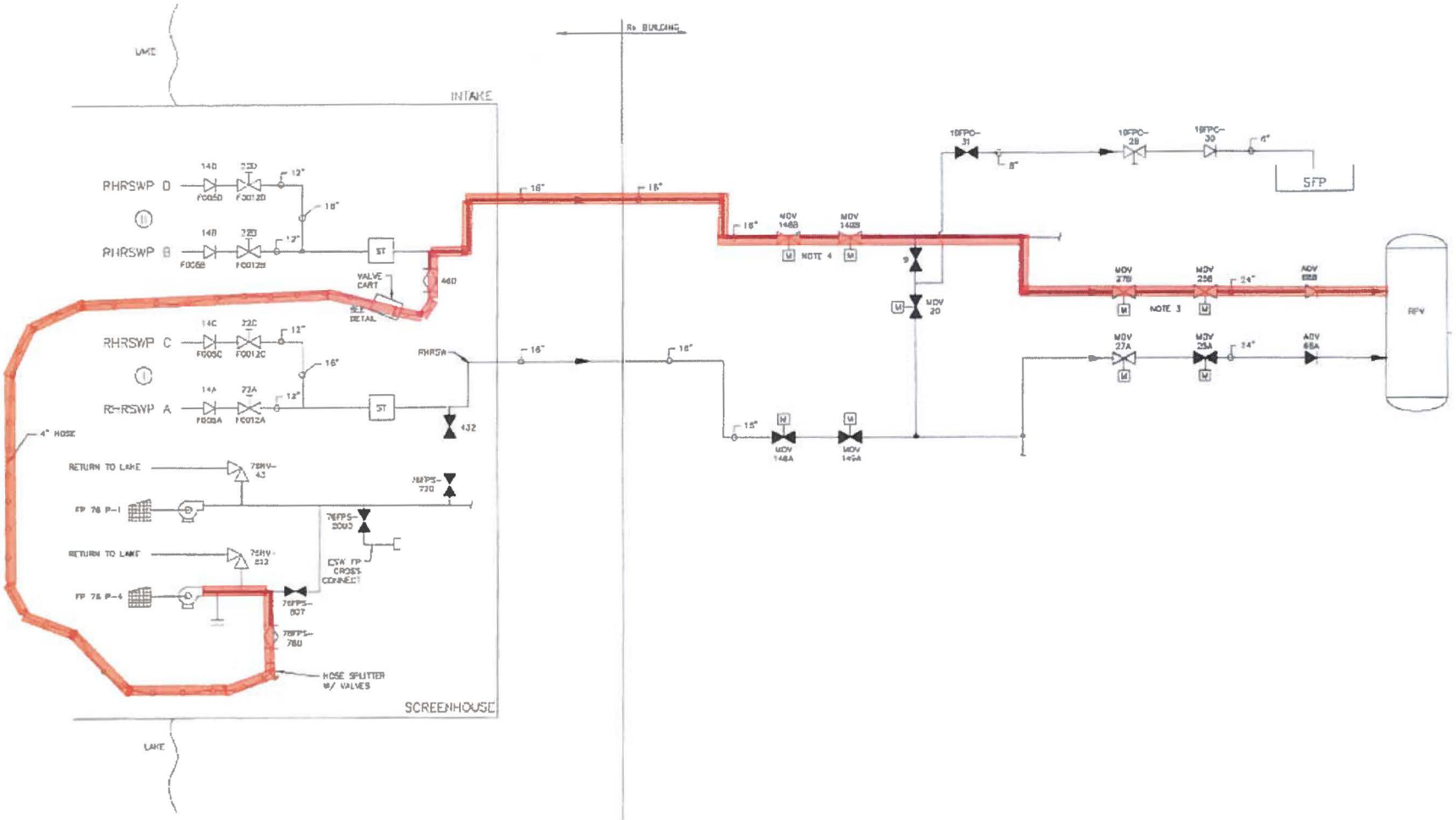
8 References

The following references support the updates to the Phases 1 & 2 Overall Integrated Plan described in this attachment.

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 (ML13143A321)
2. Letter JAFP-14-0075, James A. FitzPatrick 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 (ML14181B117)
3. Letter JAFP-15-0149, James A. FitzPatrick Phase 2 Overall Integrated Plan In Response To June 6, 2013 Commission Order Modifying License With Regard To Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated December 29, 2015 (ML15365A593)
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 (ML15113B318)
5. 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 (ML13304B836)
6. 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 (ML15104A118)
7. NRC letter to James A. FitzPatrick Nuclear Power Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents), dated February 12, 2015 (ML15007A090)
8. NRC Letter to James A. FitzPatrick Nuclear Power Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 2 of Order EA-13-109 (Severe Accident Capable Hardened Vents), dated December 16, 2016 (ML16343B030)
9. NRC Letter to James A. FitzPatrick Nuclear Power Plant – Relaxation of the Schedule Requirements for Order EA-13-109: Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions, dated January 9, 2017 (ML16336A754)

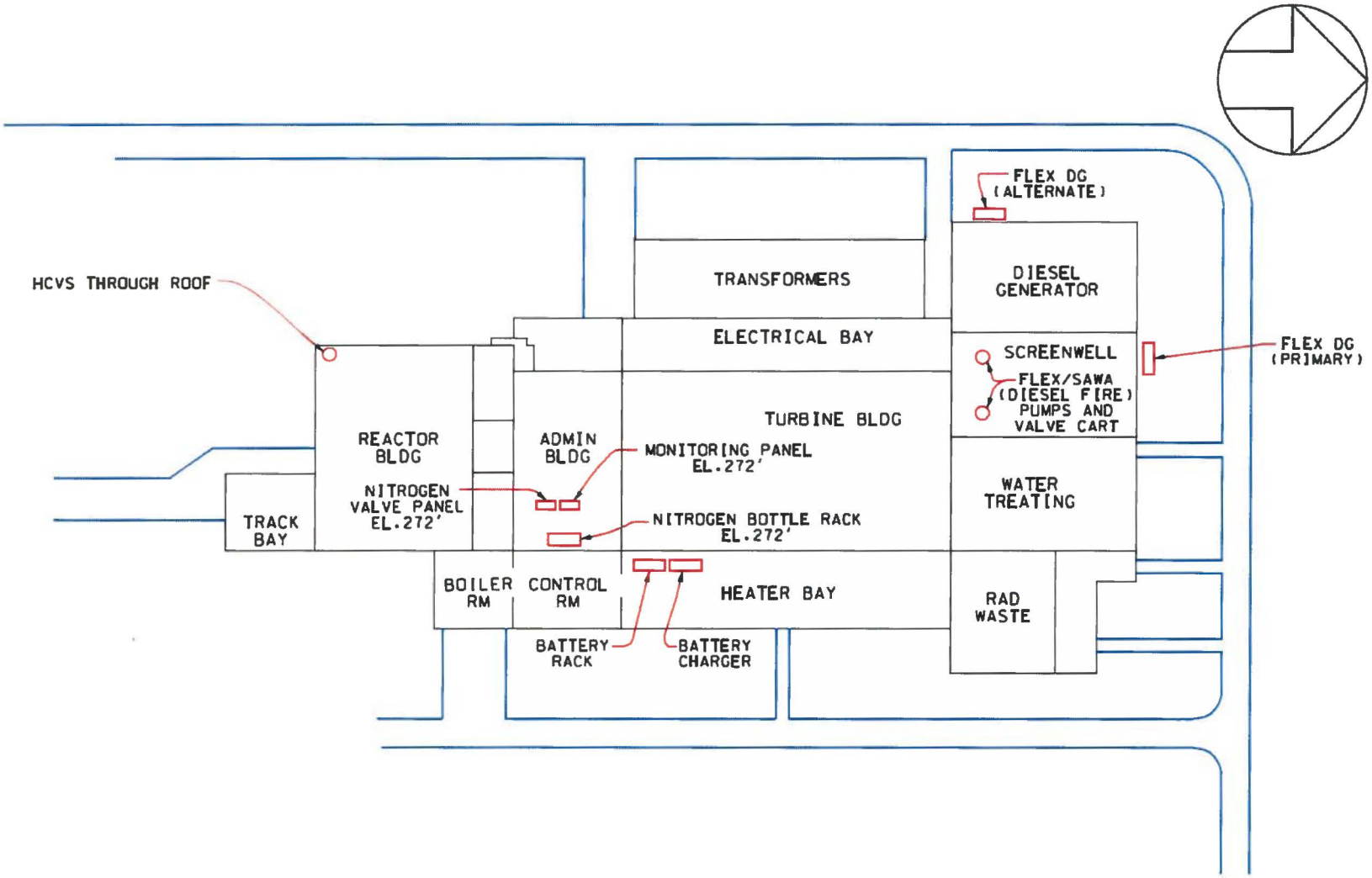
Seventh Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

Phase 2 Overall Integrated Plan: Sketch 1



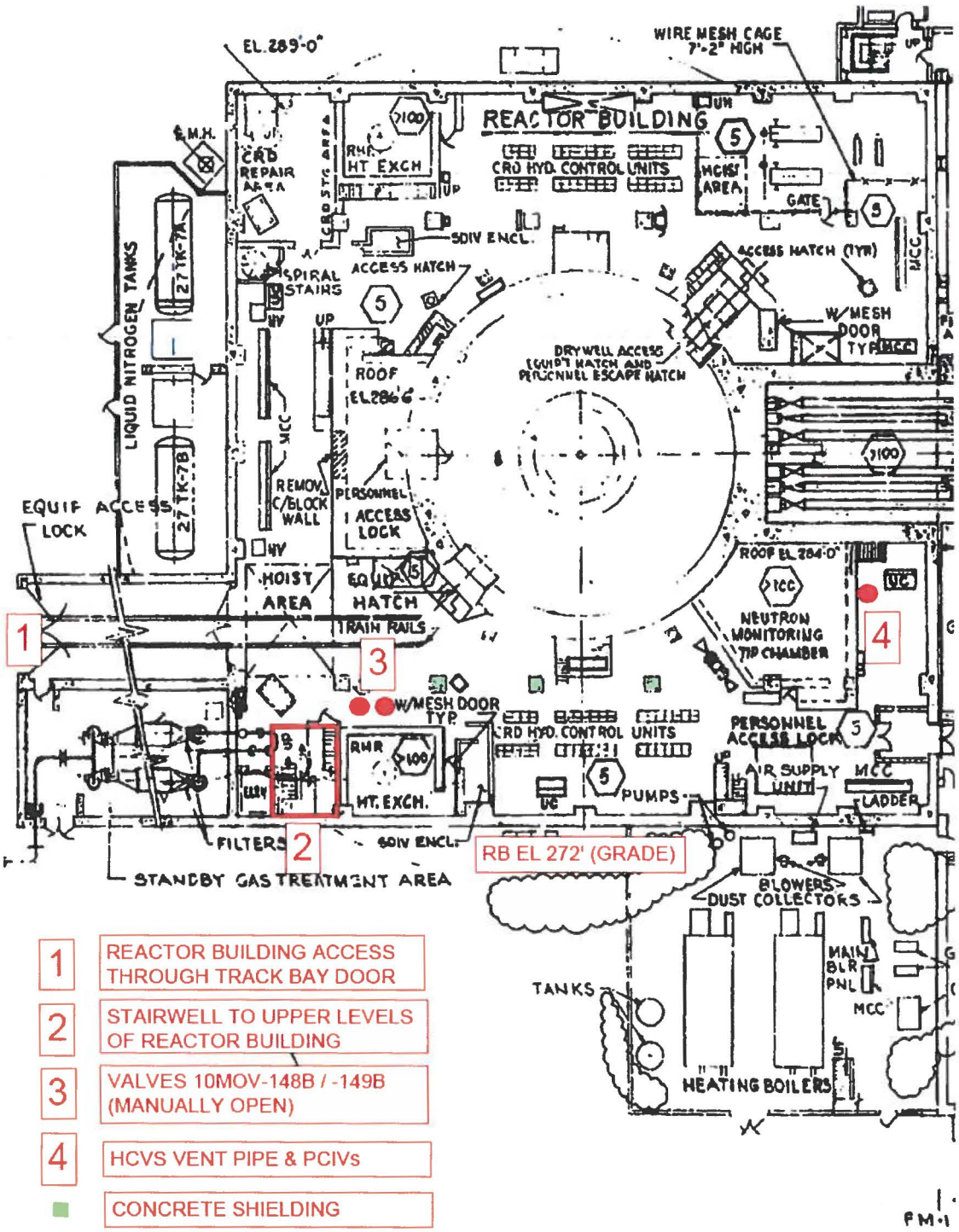
Seventh Six-Month Status Report for Phases 1 and 2 Implementation of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions

Phase 2 Overall Integrated Plan: Sketch 3



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

Phase 2 Overall Integrated Plan: Sketch 4A



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

Phase 2 Overall Integrated Plan: Sketch 4B