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10 CFR 50

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

SUSQUEHANNA STEAM ELECTRIC STATION
OVERALL INTEGRATED PLAN IN RESPONSE TO
JUNE 6, 2013 COMMISSION ORDER TO MODIFY
LICENSES WITH REGARD TO RELIABLE HARDENED
CONTAINMENT VENTS CAPABLE OF OPERATION
UNDER SEVERE ACCIDENT CONDITIONS
(NRC ORDER EA-13-109)
PLA-7180

Docket Nos. 50-387
and 50-388

References:

1. *NRC Generic Letter 89-16, Installation of a Hardened Wetwell Vent, dated September 1, 1989*
2. *NRC Order Number EA-12-050, Order Modifying Licenses with Regard to Requirements for Reliable Hardened Containment Vents, dated March 12, 2012*
3. *NRC Order Number EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident, dated June 6, 2013*
4. *NRC Interim Staff Guidance JLD-ISG-2013-02, Compliance with Order EA-13-109, Severe Accident Reliable Hardened Containment Vents, dated November 14, 2013*
5. *Draft NEI 13-02 Phase 1 OIP Template, dated May 16, 2014*
6. *NEI 13-02, Industry Guidance for Compliance with Order EA–13–109, Revision 0, dated November 2013*

On June 6, 2013, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 3) to PPL Susquehanna, LLC (PPL). Reference 3 was immediately effective and directs PPL to require Susquehanna SES Units 1 and 2 (Mark II containments) to take certain actions to ensure that these facilities have a hardened containment vent system (HCVS) The HCVS is to assist in preventing core damage when heat removal capability is lost and to function in severe accident conditions. Specific requirements are outlined in Attachment 2 of Reference 3.

Reference 3 requires submission of an Overall Integrated Plan (OIP) by June 30, 2014 for Phase 1 of the order. The interim staff guidance (Reference 4) was issued

November 14, 2013, which provides direction regarding the content of this OIP. The purpose of this letter is to provide the OIP for Phase 1 of the Order pursuant to Section IV, Condition D.1, of Reference 3. This letter confirms that PPL has received Reference 4 and has a Phase 1 OIP complying with the guidance for the purpose of ensuring the functionality of a HCVS to remove decay heat from the containment, and maintain control of containment pressure within acceptable limits following events that result in the loss of active containment heat removal capability while maintaining the capability to operate under severe accident (SA) conditions resulting from an extended loss of alternating current power (ELAP) as described in Attachment 2 of Reference 3.

Reference 6, Section 7.0 contains the specific reporting requirements for the OIP. The information in the enclosure provides PPL Phase 1 OIP pursuant to Section 7.0 of Reference 6 by use of the Phase 1 OIP Template per reference 5.

For the purposes of compliance with Phase 1 of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions, PPL plans to install a severe accident capable wetwell vent.

Compliance with the requirements of reference 3 will supersede all actions or commitments associated with References 1 and 2. Any actions or commitments made relative to Reference 1 or 2 are rescinded and not binding by submittal of the Reference 3 Phase 1 OIP via this letter.

This letter contains no new regulatory commitments.

If you have any questions regarding this report, please contact John L. Tripoli, Manager, Nuclear Regulatory Affairs, at (570) 542-3100.

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

Executed on: 6/26/14

T. S. Rausch

Enclosure: Susquehanna Units 1 and 2 Hardened Containment Venting System (HCVS) Phase 1 Overall Integrated Plan

cc: Director, Office of Nuclear Reactor Regulation
NRC Region I
Mr. Rajender Auluck, NRR/JLD/PSB, NRC
Mr. J. E. Greives, NRC Sr. Resident Inspector
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Enclosure to PLA-7180

Susquehanna Units 1 and 2
Hardened Containment Venting System (HCVS)
Phase 1 Overall Integrated Plan

Susquehanna Units 1 and 2
Hardened Containment Venting System (HCVS)
Phase 1 Overall Integrated Plan

Table of Contents:

Part 1: General Integrated Plan Elements and Assumptions

Part 2: Boundary Conditions for Wet Well Vent

Part 3: Boundary Conditions for Dry Well Vent

Part 4: Programmatic Controls, Training, Drills and Maintenance

Part 5: Implementation Schedule Milestones

Attachment 1: HCVS Portable Equipment

Attachment 2: Sequence of Events

Attachment 3: Conceptual Sketches

Attachment 4: Failure Evaluation Table

Attachment 5: References

Attachment 6: Changes/Updates to this Overall Integrated Implementation Plan

Attachment 7: List of Overall Integrated Plan Open Items

Introduction

In 1989, the NRC issued Generic Letter 89-16, "Installation of a Hardened Wetwell Vent," to all licensees of BWRs with Mark I containments to encourage licensees to voluntarily install a hardened wetwell vent. In response, licensees installed a hardened vent pipe from the wetwell to some point outside the secondary containment envelope (usually outside the reactor building).

On March 19, 2013, the Nuclear Regulatory Commission (NRC) Commissioners directed the staff per Staff Requirements Memorandum (SRM) for SECY -12-0157 to require licensees with Mark I and Mark II containments to "upgrade or replace the reliable hardened vents required by Order EA-12-050 with a containment venting system designed and installed to remain functional during severe accident conditions." In response, the NRC issued Order EA-13-109, *Issuance of Order to Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accidents*, June 6, 2013. The Order (EA-13-109) requires that licensees of BWR facilities with Mark I and Mark II containment designs ensure that these facilities have a reliable hardened vent to remove decay heat from the containment, and maintain control of containment pressure within acceptable limits following events that result in the 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).

The Order requirements are applied in a phased approach where:

- "Phase 1 involves upgrading the venting capabilities from the containment wetwell to provide reliable, severe accident capable hardened vents to assist in preventing core damage and, if necessary, to provide venting capability during severe accident conditions." (Completed "no later than startup from the second refueling outage that begins after June 30, 2014, or June 30, 2018, whichever comes first.")

- "Phase 2 involves providing additional protections for severe accident conditions through installation of a reliable, severe accident capable drywell vent system or the development of a reliable containment venting strategy that makes it unlikely that a licensee would need to vent from the containment drywell during severe accident conditions." (Completed "no later than startup from the first refueling outage that begins after June 30, 2017, or June 30, 2019, whichever comes first.")

The NRC provided an acceptable approach for complying with Order EA-13-109 through Interim Staff Guidance (JLD-ISG-2013-02) issued in November 2013. The ISG endorses the compliance approach presented in NEI 13-02 Revision 0, *Compliance with Order EA-13-109, Severe Accident Reliable Hardened Containment Vents*, with clarifications. Except in those cases in which a licensee proposes an acceptable alternative method for complying with Order EA-13-109, the NRC staff will use the methods described in this ISG (NEI 13-02) to evaluate licensee compliance as presented in submittals required in Order EA-13-109.

The Order also requires submittal of an overall integrated plan, which will provide a description of how the requirements of the Order will be achieved. This document provides the Overall Integrated Plan (OIP) for complying with Order EA-13-109 using the methods described in NEI 13-02 and endorsed by NRC JLD-ISG-2013-02. Six-month progress reports will be provided consistent with the requirements of Order EA-13-109.

The Susquehanna Unit 1 and 2 venting actions for the EA-13-109 severe accident capable venting scenario can be summarized by the following:

- The HCVS will be initiated via manual action from the Main Control Room (MCR) and Remote Operating Station (ROS) at the appropriate time based on procedural guidance in response to plant conditions from observed or derived symptoms.

- The vent will utilize Containment Parameters of Pressure, Suppression Pool Level and Temperature from the MCR instrumentation to monitor effectiveness of the venting actions.

- The vent operation will be monitored by HCVS valve position, vent path temperature and effluent radiation levels.

- The HCVS motive force will be monitored and have the capacity to operate for 24 hours with installed equipment. Replenishment of the motive force will be by use of portable equipment once the installed motive force is exhausted.

- Venting actions will be capable of being maintained for a sustained period of up to 7 days or a shorter time if justified.

Part 1: General Integrated Plan Elements and Assumptions

Extent to which the guidance, JLD-ISG-2013-02 and NEI 13-02, are being followed. Identify any deviations.

Include a description of any alternatives to the guidance. A technical justification and basis for the alternative needs to be provided. This will likely require a pre-meeting with the NRC to review the alternative.

Ref: JLD-ISG-2013-02

Compliance will be attained for Susquehanna Units 1 and 2 with no known deviations to the guidelines in JLD-ISG-2013-02 and NEI 13-02 for each phase as follows:

Unit 1:

- Phase 1 (wetwell): by the startup from the second refueling outage that begins after June 30, 2014, or June 30, 2018, whichever comes first. Currently scheduled for Unit 1 2nd quarter 2018
- Phase 2: by the startup from first refueling outage that begins after June 30, 2017, or June 30, 2019, whichever comes first. Currently scheduled for Unit 1 2nd quarter 2018

Unit 2

- Phase 1 (wetwell): by the startup from the second refueling outage that begins after June 30, 2014, or June 30, 2018, whichever comes first. Currently scheduled for Unit 2 2nd quarter 2017
- Phase 2: by the startup from first refueling outage that begins after June 30, 2017, or June 30, 2019, whichever comes first. Currently scheduled for Unit 2 2nd quarter 2019.

If deviations are identified at a later date, then the deviations will be communicated in a future 6-month update following identification.

State Applicable Extreme External Hazard from NEI 12-06, Section 4.0-9.0

List resultant determination of screened in hazards from the EA-12-049 Compliance.

Ref: NEI 13-02 Section 5.2.3 and D.1.2

The hazards applicable to Susquehanna Steam Electric Station (SSES) are seismic, external flooding, severe storms with high winds (hurricanes and tornados), snow, ice, extreme cold and high temperature.

Part 1: General Integrated Plan Elements and Assumptions

Key Site assumptions to implement NEI 13-02 HCVS Actions.

Provide key assumptions associated with implementation of HCVS Phase 1 Actions

Ref: NEI 13-02 Section 1

Mark I/II Generic HCVS Related Assumptions:

Applicable EA-12-049 assumptions:

049-1. Assumed initial plant conditions are as identified in NEI 12-06 section 3.2.1.2 items 1 and 2

049-2. Assumed initial conditions are as identified in NEI 12-06 section 3.2.1.3 items 1, 2, 4, 5, 6 and 8

049-3. Assumed reactor transient boundary conditions are as identified in NEI 12-06 section 3.2.1.4 items 1, 2, 3 and 4

049-4. No additional events or failures are assumed to occur immediately prior to or during the event, including security events (Reference NEI 12-06, section 3.2.1.3 item 9).

049-5. At Time=0 the event is initiated and all rods insert and no other event beyond a common site ELAP is occurring at Susquehanna Units 1 and 2. (NEI 12-06, section 3.2.1.3 item 9 and 3.2.1.4 items 1-4)

049-6. At or before 1 hour an ELAP is declared and actions begin as defined in EA-12-049 compliance

049-7. DC power and distribution can be credited for the duration determined per the EA-12-049 (FLEX) methodology for station battery usage.

049-8. Additional deployment resources are assumed to begin arriving at hour 6 and fully staffed by 24 hours

049-9. All activities associated with plant specific EA-12-049 FLEX strategies that are not specific to implementation of the HCVS, including such items as debris removal, communication, notifications, SFP level and makeup, security response, opening doors for cooling, and initiating conditions for the event, can be credited as previously evaluated for FLEX.

Applicable EA-13-109 generic assumptions:

109-1. Site response activities associated with EA-13-109 actions are considered to have no access limitations associated with radiological impacts while RPV level is above 2/3 core height (core damage is not expected).

Part 1: General Integrated Plan Elements and Assumptions

109-2. Portable equipment can supplement the installed equipment after 24 hours provided the portable equipment credited meets the criteria applicable to the HCVS. Examples include the use of FLEX gas supply credited to recharge pneumatic supply lines for HCVS components after 24 hours and use of portable 4 kV FLEX generators to reenergize the credited HCVS system battery charger after 24 hours. The FLEX portable generators and portable gas supply used must be demonstrated to meet the "SA Capable" criteria that are defined in NEI 13-02 and Appendix D Section D.1.3.

109-3. Spent Fuel Pool (SFP) Level is maintained with either on-site or off-site resources such that the SFP does not contribute to the analyzed source term (Reference: HCVS-FAQ-07)

109-4. Existing containment components design and testing values are governed by existing plant containment criteria (e.g., Appendix J) and are not subject to the testing criteria from NEI 13-02 (Reference: HCVS- FAQ-05 and NEI 13-02 section 6.2.2).

109-5. Classical design basis evaluations and assumptions are not required when assessing the operation of the HCVS. The reason this is not required is that the order postulates an unsuccessful mitigation of an event such that an ELAP progresses to a severe accident with ex-vessel core debris, which classical design basis evaluations are intended to prevent. (Reference NEI 13-02 section 2.3.1).

109-6. HCVS manual actions that require minimal operator steps and can be performed in the postulated thermal and radiological environment at the location of the step(s) (e.g., load stripping, control switch manipulation, valving-in portable gas supply is acceptable to obtain HCVS venting dedicated functionality. (Reference: HCVS-FAQ-01)

109-7. HCVS dedicated equipment is defined as vent process elements that are required for the HCVS to function in an ELAP event that progresses to core melt ex-vessel. (Reference: HCVS-FAQ-02 and White Paper HCVS-WP-01)

109-8. Use of MAAP Version 4 or higher provides adequate assurance of the plant conditions (e.g., RPV water level, temperatures, etc.) assumed for Order EA-13-109 BDBEE and SA HCVS operation. (reference FLEX MAAP Endorsement ML13190A201) Additional analysis using RELAP5/MOD 3, GOTHIC, PCFLUD, LOCADOSE and SHIELD are acceptable methods for evaluating environmental conditions in areas of the plant provided the specific version utilized is documented in the analysis.

Part 1: General Integrated Plan Elements and Assumptions

109-9. Utilization of NRC Published Accident evaluations (e.g. SOARCA, SECY-12-0157, and NUREG 1465) as related to Order EA-13-109 conditions are acceptable as references. (Reference: NEI 13-02 section 8)

109-10. Permanent modifications installed per EA-12-049 are assumed implemented and may be credited for use in EA-13-109 Order response.

109-11. This Overall Integrated Plan is based on Emergency Operating Procedure changes consistent with EPG/SAGs Revision 3 as incorporated per the sites EOP/SAMG procedure change process.

109-12. Under the postulated scenarios of order EA-13-109, the Control Room is adequately protected from excessive radiation dose per General Design Criterion (GDC) 19 in 10CFR50 Appendix A and no further evaluation of its use as the preferred HCVS control location is required. (Reference: HCVS-FAQ-01). In addition, adequate protective clothing and respiratory protection is available if required to address contamination issues.

Plant Specific HCVS Related Assumptions/Characteristics:

PLT-1. All load stripping to support HCVS operation is accomplished within forty five (45) minutes of event initiation.