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PSEG
Nuclear LLC

Order EA-13-109

LR-N15-0129
JUN 18 2015

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

Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: Hope Creek Generating Station's Second Six-Month Status Report in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)

References:

1. NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013

2. PSEG Letter LR-N14-0155, "PSEG Nuclear LLC'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 25, 2014

3. PSEG Letter LR-N14-0258, "Hope Creek Generating Station's First Six-Month Status Report in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109)," dated December 19, 2014

4. NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109," Revision 0, dated November 2013

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," dated November 14, 2013

6. NRC Letter to PSEG, "Hope Creek Generating Station – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC NO. MF4458)," dated February 12, 2015

On June 6, 2013, the Nuclear Regulatory Commission (NRC) issued Order EA-13-109 (Reference 1) to all licensees that operate boiling-water reactors (BWRs) with Mark I and Mark II containment designs. The Order was effective immediately and requires the Hope Creek Generating Station (HCGS) to install a reliable hardened venting capability for pre-core damage and severe accident conditions, including those involving a breach of the reactor vessel by molten core debris. In accordance with Condition IV.D.1 of NRC Order EA-13-109, PSEG submitted an Overall Integrated Plan (Reference 2) for implementation of the Phase 1 (torus vent) requirements of the Order. The first six-month status report was transmitted to the NRC on December 19, 2014 (Reference 3). The purpose of this letter is to provide the second six-month status report for HCGS, pursuant to Condition IV.D.3 of NRC Order EA-13-109.

Attachment 1 contains the second six-month status report for HCSG implementation of Phase 1 of NRC Order EA-13-109, following the report content guidance of Nuclear Energy Institute (NEI) Report 13-02 (Reference 4) as endorsed by NRC Interim Staff Guidance JLD-ISG-2013-02 (Reference 5). The attached report provides an update of the milestone accomplishments since the submittal of the previous six-month status report (Reference 3), including any changes to the compliance method, schedule, and the need and basis for relief or relaxation from specific requirements of NRC Order EA-13-109. The status of open items identified in the NRC's Interim Staff Evaluation (Reference 6) is included in the attached update.

There are no regulatory commitments contained in this letter. If you have any questions or require additional information, please do not hesitate to contact Mr. Brian J. Thomas at 856-339-2022.

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

Executed on June 18, 2015
(Date)

Sincerely,

Paul J. Davison

Paul J. Davison
Site Vice President
Hope Creek Generating Station

Attachment 1: HCGS Second Six-Month Status Report for Implementation of NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions"

cc: Mr. William Dean, Director of Office of Nuclear Reactor Regulation
Mr. Daniel Dorman, Administrator, Region I, NRC
Ms. Carleen Parker, Project Manager, NRC
Mr. Justin Hawkins, NRC Senior Resident Inspector, Hope Creek
Mr. Charles Norton, Project Manager, NRC
Mr. Patrick Mulligan, Manager IV, NJBNE
Mr. Thomas MacEwen, Hope Creek Commitment Tracking Coordinator
Mr. Lee Marabella, PSEG Corporate Commitment Coordinator

HCGS Second Six-Month Status Report for Implementation of NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions"

1 Introduction

PSEG Nuclear LLC (PSEG) developed an Overall Integrated Plan (OIP) (Reference 1) for the Hope Creek Generating Station (HCGS), to address the installation of a Hardened Containment Vent System (HCVS) that provides reliable hardened venting capability for pre-core damage and 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). This report provides a status update of milestone accomplishments since submittal of the previous report (Reference 3) for HCGS implementation of NRC Order EA-13-109 Phase 1 (torus vent), including any changes to the compliance method, schedule, and the need and basis for relief or relaxation from specific requirements of NRC Order EA-13-109.

2 Milestone Accomplishments

No milestones have been completed since the first six-month status report (Reference 3) was transmitted to the NRC.

3 Milestone Schedule Status

The following table provides an update to the OIP (Reference 1) milestones. The table provides the target completion date and activity status of each item. The dates are planning dates subject to change as design and implementation details are developed.

Milestone	Target Completion Date	Activity Status	Comments
Phase 1 HCVS Milestone Table			
Submit Overall Integrated Plan	Jun 2014	Complete	
Submit Six-Month Updates			
Update 1	Dec 2014	Complete	
Update 2	Jun 2015	Complete	Completed via this report
Update 3	Dec 2015	Not Started	
Update 4	Jun 2016	Not Started	
Modifications			
Hold preliminary/conceptual design meeting	Jun 2014	Complete	
Design Engineering On-site/Complete	Oct 2015	Started	Vendor selection is complete and final design is in progress
Implementation Outage	Oct 2016	Not started	
Walk-Through Demonstration / Functional Test	Nov 2016	Not started	
Procedure Changes Active			
Operations Procedure Changes Developed	Jun 2016	Started	
Site-Specific Maintenance Procedure Developed	Jun 2016	Not started	
Procedure Changes Active	Nov 2016	Not started	
Training			
Training Complete	Jun 2016	Not started	
Completion			
Submit Completion Report	Dec 2016	Not started	

4 Changes to Compliance Method

PSEG's planned alternatives to NEI 13-02 (Reference 4) and NRC Interim Staff Guidance JLD-ISG-2013-02 (Reference 5) were identified in the previous six-month status report (Reference 3) and are also identified as open items in the NRC Interim Staff Evaluation (ISE) (Reference 6) for compliance with Phase 1 of NRC Order EA-13-109. These alternatives pertain to 1) monitoring the status of vent operation and 2) the height of the vent release point, and are described below in Sections 4.1 and 4.2.

4.1 Monitoring the Status of Vent Operation

NEI 13-02, which is endorsed by JLD-ISG-2013-02, contains criteria for monitoring HCVS vent pipe conditions including radiological releases, vent pipe pressure and temperature in order to monitor HCVS operation. HCGS currently has a dual element (high/low range) flow monitor as part of the existing torus vent radiation monitoring system and will use the flow monitor for HCVS operation. In lieu of vent pipe temperature and pressure, the vent flow signal will be displayed at the Primary Operating Station (POS). The vent operation will be monitored by HCVS valve position, vent flow, and effluent radiation levels. Containment parameters of pressure, torus level and temperature from the Main Control Room (MCR) instrumentation will be used to monitor effectiveness of the venting actions. This item is related to NRC ISE Open Item #6 regarding identification and qualification of all instrumentation necessary to support HCVS operation.

4.2 Vent Release Point Height

PSEG provided a 20-day response to JLD-ISG-2013-02 via Reference 7, which describes an exception to NRC Order EA-13-109 Attachment 2, Requirement 1.2.2, regarding the vent release point height. The HCVS discharge path is a dedicated 12-inch vent pipe with the release point of the vent piping located approximately 50 feet below the top of the Reactor Building dome. The vent pipe is routed to a point above adjacent structures except for the Reactor Building dome, and is located such that the release point will vent away from ventilation system intake and exhaust openings, MCR, and other emergency response facilities. The location of the release was originally analyzed to support the design and installation of the existing torus vent to ensure habitability of the control room and is being re-evaluated as part of the HCVS design. The need for PSEG to request relaxation of this Order requirement is tracked as NRC ISE Open Item #13.

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

The vent release point height described in Section 4.2 above is an exception to NRC Order EA-13-109 Attachment 2, Requirement 1.2.2, and will be the subject of a request for relaxation upon completion of further evaluation of vent releases. PSEG plans to submit the request for relaxation via separate letter, prior to the next six-month update due in December 2015.

6 Open Items from Overall Integrated Plan and Draft Safety Evaluation

The following table provides a status of open items identified in the HCGS Overall Integrated Plan (OIP) (Reference 1) and NRC Interim Staff Evaluation (ISE) (Reference 6).

Item Ref.	Description	Status
ISE #1 OIP #1	Finalize time constraints and their bases. Make available for NRC staff audit the finalized time constraints for remote manual operations and their bases.	Started
ISE #2 OIP #2	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.	Started
ISE #3 OIP #6	Provide the seismic and tornado missile final design criteria for the HCVS stack.	Started
ISE #4	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.	Started See §7.1
ISE #5 OIP #4	Perform dose evaluation for venting actions (OIP #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.	Started
ISE #6	Make available for NRC staff audit descriptions of all instrumentation and controls (existing and planned) necessary to implement this order including qualification methods.	Started
ISE #7	Make available for NRC staff audit the final sizing evaluation for HCVS batteries/battery charger including incorporation into FLEX DG loading calculation.	Started
ISE #8	Make available for NRC staff audit documentation of the HCVS nitrogen pneumatic system design including sizing and location.	Started

Item Ref.	Description	Status
ISE #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.	Started
ISE #10	Make available for NRC staff audit 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 venting.	Started
ISE #11	Provide a description of the strategies for hydrogen control that minimizes the potential for hydrogen gas migration and ingress into the reactor building or other buildings.	Started
ISE #12 OIP #5	Provide a description of the final design of the HCVS to address hydrogen detonation and deflagration.	Started
ISE #13 OIP #3	Finalize χ/Q analysis (OIP #3). Submit a relaxation request as stated in the Order for the deviation from Order EA-13-109 provision 1.2.2, "The HCVS Section 3.2.2.3 shall discharge the effluent to a release point above the main plant structures," which includes a technical justification for the deviation.	Started

7 Interim Staff Evaluation Impacts

The information in this section is provided in support of resolution of open items identified in Section 6.

7.1 ISE Open Item #4, Communications

The HCVS Primary Operating Station (POS) in the Lower Control Equipment Room and the Remote Operating Station (ROS) in the electrical chase are located at 102 ft elevation of the Control/Diesel Building. The POS and ROS are two levels below the Main Control Room (MCR) and are accessible from the MCR via pathways within the power block. Accessibility under postulated temperature and radiological conditions is being addressed to support resolution of ISE Open Item #5.

PSEG has implemented communications enhancements including radio upgrades to support diverse and flexible (FLEX) mitigating strategies for beyond-design-basis external events. These enhancements include the addition of a remote desk set in the MCR which will be provided with FLEX-backed uninterruptible power supplies and direct connections to repeaters for reliable radio communication within the power block,

including the MCR and the Operations Support Center. Communication between HCVS operators and decision makers would be maintained to support HCVS operation based on the proximity of the POS and ROS to the emergency response facilities, and radio communications capability.

8 References

1. PSEG letter LR-N14-0155, "PSEG Nuclear LLC'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-13-1 09)," dated June 25, 2014
2. NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Effective Immediately)," dated June 6, 2013
3. PSEG Letter LR-N14-0258, "Hope Creek Generating Station's First Six-Month Status Report in Response to June 6, 2013 Commission Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (Order Number EA-13-109), dated December 19, 2014
4. NEI 13-02, "Industry Guidance for Compliance with Order EA 13 109," Revision 0, dated November 2013
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," dated November 14, 2013
6. NRC Letter to PSEG, "Hope Creek Generating Station – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Phase 1 of Order EA-13-109 (Severe Accident Capable Hardened Vents) (TAC NO. MF4458)," dated February 12, 2015
7. PSEG Letter LR-N13-0289, "Hope Creek Generating Station's Notification Pursuant to Condition IV.C.1 of the 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 13, 2013