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Order EA-12-049

LR-N15-0087

APR 13 2015

U.S. Nuclear Regulatory Commission
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Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: Supplement to the Request for Relaxation from Schedule Requirements of NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" – Hope Creek Generating Station

References:

1. NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Effective Immediately)," dated March 12, 2012
2. PSEG Letter LR-N15-0055, "PSEG Nuclear LLC's Request for Relaxation from Schedule Requirements of NRC Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events' – Hope Creek Generating Station," dated March 11, 2015
3. NRC letter, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012

4. PSEG Letter LR-N14-0035, "PSEG Nuclear LLC's Seismic Hazard and Screening Report (CEUS Sites) Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident – Hope Creek Generating Station," dated March 28, 2014
5. PSEG Letter LR-N14-0041, "PSEG Nuclear LLC's Response to Request for Information Regarding Flooding Aspects of Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident – Hope Creek Generating Station Flood Hazard Reevaluation," dated March 12, 2014
6. NRC Order EA-12-051, "Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Effective Immediately)," dated March 12, 2012
7. NRC Letter, "Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Seismic Hazard Re-evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated May 9, 2014

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to PSEG Nuclear LLC (PSEG). NRC Order EA-12-049 requires the Hope Creek Generating Station (HCGS) to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. In Reference 2, PSEG requested a relaxation of the schedule requirements of NRC Order EA-12-049.

This letter provides supplemental information in support of the HCGS request for schedule relaxation from NRC Order EA-12-049.

Circumstances Resulting in the Need for Schedule Relaxation

The schedule relaxation request in Reference 2 was necessitated by unanticipated delays associated with changes to FLEX equipment storage and deployment strategies. PSEG's decision to relocate FLEX diesel generators to the HCGS Unit 2 reactor building roof is consistent with the need to provide reasonable protection of the FLEX equipment from external flooding hazards. However, the impact of this decision on the design and layout of the equipment requires additional time to complete the necessary design, procurement, and installation activities.

The HCGS FLEX storage strategy was changed from permanent storage inside the HCGS Unit 2 cancelled plant area to storage at diverse, external areas due to challenges with upgrading the intended HCGS Unit 2 storage area to existing codes and standards for permanent storage. The strategy now includes movement of some FLEX equipment into the HCGS Unit 2 plant cancelled area in the event that trigger conditions are met for an external flood event (for which there is ample warning time). This approach provides protection of portable equipment from storm surge conditions and the capability to deploy the equipment after the storm surge flood conditions subside. This change also contributed to the need to request schedule relaxation.

Plant Design Features to Preclude a Beyond-Design Basis External Event

A sequence of events similar to those encountered at the Fukushima Dai-ichi station is considered to be unlikely to occur in the United States based on current regulatory requirements and plant capabilities. HCGS plant-specific design features that preclude the occurrence of beyond-design-basis Extended Loss of AC Power and Loss of Ultimate Heat Sink (ELAP/LUHS) include the following:

1. Four independent Emergency Core Cooling System channels
2. Four independent Emergency Diesel Generators (EDGs) inside a building designed to protect against external hazards including seismic, flooding, high wind, and extreme temperature events
3. Separate safety related diesel fuel storage and transfer subsystems for each EDG located in the same structure as the EDGs
4. Service Water Intake Structure (SWIS) designed for protection against external hazards including seismic, flooding, high wind, and extreme temperature events.

Re-evaluated Seismic and Flooding Hazards

In response to the NRC's March 12, 2012 information request (Reference 3), PSEG re-evaluated the seismic and flooding hazards applicable to HCGS. Key results of the seismic and flooding hazard re-evaluations are as follows:

- The revised seismic hazard ground motion response spectra (GMRS), which were developed using NRC-endorsed methods and provided to the NRC in Reference 4, are enveloped by the design basis safe shutdown earthquake in the 1-10 Hz frequency range such that no additional seismic risk evaluation is required (References 4 and 7).
- Comparison of the seismic capacity of the condensate storage tank (CST) to the revised GMRS concludes that the CST is seismically adequate to support the mitigating strategies.
- External flooding hazards were re-evaluated using present day regulatory guidance and methodologies, and are bounded by the HCGS current licensing basis hazards with the exception of the Local Intense Precipitation (LIP) event (Reference 5). The re-evaluated LIP flood height remains below the flood-protected elevations, and

PSEG has revised procedural guidance to close watertight doors in advance of a LIP event if meteorological trigger conditions are met.

The re-evaluated seismic and flooding hazards further demonstrate that an ELAP/LUHS event at HCGS is prevented by robust design.

Diverse and Flexible (FLEX) Equipment

PSEG has purchased major FLEX equipment for HCGS and has the following equipment on site:

1. Diesel-driven FLEX Ultimate Heat Sink (UHS) pumps
2. Debris removal equipment
3. Towing equipment
4. Diesel refueling equipment

Event Mitigation Capabilities During the Period of Requested Relaxation

HCGS event mitigation capabilities that do not rely on full implementation of diverse and flexible (FLEX) strategies but will be in place before startup from the spring 2015 refueling outage are described below. These capabilities would be used as necessary and available following an ELAP/LUHS scenario during the period of the requested schedule relaxation.

Reactor Pressure Vessel (RPV) Pressure Control

Safety relief valves (SRVs) will remain operational for at least six hours following an ELAP/LUHS. In addition, a power supply that is used for compliance with 10 CFR 50.54(hh) requirements ("B.5.b equipment") can be used to re-power the SRV solenoids. A temporary air compressor staged outside can be cross-tied with the instrument gas system to provide motive force for the valves.

RPV Level Control

The Reactor Core Isolation Cooling (RCIC) system provides RPV injection from the CST or torus. HCGS has a hardened direct torus vent which can be opened to reduce the rate of suppression pool temperature rise and allow RCIC to remain viable for an extended duration.

The High Pressure Coolant Injection (HPCI) system provides RPV injection from the CST or torus and can be used for pressure control if the CST is available.

Additional means of water injection to the RPV are via fire water storage tanks using a B.5.b diesel-driven pump, or a diesel-driven FLEX ultimate heat sink (UHS) pump and FLEX piping connections at the SWIS.

Containment Control

Torus venting during an ELAP/LUHS would attenuate torus temperature rise and improve RCIC availability, as well as reducing containment pressure to enhance the capability of external low-pressure injection systems. Torus venting can be initiated via the hardened torus vent, a monitored release path, by using compressed nitrogen to open the rupture disk diaphragm and opening valves in the vent line.

Spent Fuel Pool Level Control

Spent fuel pool level instrumentation (SFPLI) equipment has been installed at HCGS to provide primary and backup level displays in accordance with NRC Order EA-12-051 (Reference 6), and will be turned over to Operations before startup from the spring 2015 refueling outage. Emergency spent fuel pool level restoration and spray flow to the SFP can be provided via B.5.b equipment. In addition, the FLEX UHS pump can be used to supply river water for emergency makeup to the SFP.

Enhanced Communications Capabilities

PSEG will complete the installation of design changes to enhance communication capabilities via satellite phones prior to startup from the spring 2015 refueling outage, in response to the NRC information request in Reference 3. Power to the satellite phones can be restored with B.5.b electrical power.

Summary

The schedule relaxation requested in Reference 2 is necessitated by unanticipated delays associated with changes to FLEX equipment storage and deployment that resulted in additional time needed to implement the FLEX strategies in accordance with NRC Order EA-12-049 requirements.

Based on the robust HCGS design, PSEG considers the likelihood of a beyond-design-basis external event resulting in an ELAP/LUHS to be extremely low. Re-evaluation of seismic and flooding hazards based on lessons learned from the Fukushima Dai-ichi accident further demonstrate the ability of HCGS to mitigate external events independent of FLEX strategies. In the unlikely event of an ELAP/LUHS at HCGS during the period of the requested schedule relaxation, event mitigation capabilities that do not rely on completion of all FLEX modifications and procedures can be implemented.

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 Thomas at 856-339-2022.

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

Executed on 4-13-2015
(Date)

Sincerely,



Paul J. Davison
Site Vice President
Hope Creek Generating Station

cc: Mr. William Dean, Director of Office of Nuclear Reactor Regulation
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