From:	Kim, James
Sent:	Wednesday, October 21, 2020 8:13 AM
To:	Duke, Paul R.
Cc:	Thomas, Brian J.; Danna, James
Subject:	Hope Creek - Final RAI RE: Revise ECCS TS with respect to HPCI System Inoperability (L-2020-LLA-0131)
Attachments:	Final RAI for Hope Creek HPCI TS Action LAR.docx

SUBJECT: HOPE CREEK GENERATING STATION – FINAL REQUEST FOR ADDITIONAL INFORMATION REGARDING REVISE TECHNICAL SPECIFICATIONS REQUIREMENTS FOR HIGH PRESSURE COOLANT INJECTION SYSTEM INOPERABILITY (L-2020-LLA-0131)

Mr. Duke,

By letter dated June 15, 2020, PSEG Nuclear LLC (PSEG), the licensee, submitted a license amendment request (LAR) to revise Hope Creek Generating Station Technical Specifications (TS) for the Emergency Core Cooling System (ECCS). The requested changes revise TS 3/4.5.1, “ECCS Operating.” The proposed changes would allow for up to 8 hours of continued plant operation when in the condition where the High Pressure Coolant Injection (HPCI) system is inoperable coincident with inoperability of a Low Pressure Coolant Injection (LPCI) subsystem and a Core Spray System (CSS) subsystem.

The NRC staff has determined that additional information is needed to complete its review of the request. On October 1, 2020, the NRC staff sent PSEG the draft Request for Additional Information (RAI). On October 15, 2020, the NRC staff and the licensee held conference call to clarify the draft RAI question. Subsequently, PSEG agreed to respond to this request within 30 days. A publicly available version of this final RAI (attached) will be placed in the NRC’s ADAMS.

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Tracking Status: None
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OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR ADDITIONAL INFORMATION
HOPE CREEK GENERATING STATION
FOR A LICENSE AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REQUIREMENTS FOR HIGH PRESSURE COOLANT INJECTION SYSTEM INOPERABILITY
EPID L-2020-LLA-0131
DOCKET NUMBER 50-354

By letter dated June 15, 2020, PSEG Nuclear LLC (PSEG), the licensee, submitted a license amendment request (LAR) to revise Hope Creek Generating Station Technical Specifications (TS) for the Emergency Core Cooling System (ECCS). The requested changes revise TS 3/4.5.1, "ECCS Operating." The proposed changes would allow for up to 8 hours of continued plant operation when in the condition where the High Pressure Coolant Injection (HPCI) system is inoperable coincident with inoperability of a Low Pressure Coolant Injection (LPCI) subsystem and a Core Spray System (CSS) subsystem.

Regulatory Analysis Basis

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(b) requires each license authorizing operation of a production or utilization facility of a type described in § 50.21 or § 50.22 will include technical specifications. The technical specification will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to § 50.34.

10 CFR 50.46 contains requirements for the design and cooling performance of the Emergency Core Cooling System (ECCS).

10 CFR 50, Appendix A, General Design Criteria (GDC) CRITERION 35 – EMERGENCY CORE COOLING states:

"A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure."

Request for Additional Information

1. Section 3.1, page 5 of the LAR, contains the following statement: "Therefore, instead of two LPCI subsystems, Hope Creek has four independent subsystems of low pressure injection capability in addition to the two low pressure CSS subsystems, providing an increased level of redundancy to that assumed in NUREG-1433 relative to the LPCI function."

Please provide information related to the capacity of each LPCI subsystem. Provide an evaluation of whether 3 LPCI subsystems can supply a combined flow rate needed to mitigate a LOCA.

2. The proposed TS Action 3.5.1.c.2.b would allow continued operation up to 8 hours for the condition where the HPCI system is inoperable, coincident with an inoperable core spray system (CSS) subsystem and an inoperable low pressure coolant injection (LPCI) subsystem. According to the TS 3.5.1 requirements, an operable ECCS requires that HPCI, two CSS subsystems, four LPCI subsystems and ADS be operable. Under the proposed Action 3.5.1.c.2.b condition, the following ECCS subsystems are still available for use in the event of a LOCA: 1 CSS subsystem, 3 LPCI subsystems, and ADS. The licensee states in its LAR that for both large-break and small-break LOCA events, the above available ECCS subsystems are sufficient to provide adequate core cooling. The licensee does not provide a discussion of an applicable LOCA analysis to support its statement above.

   The ECCS is designed to protect against the effects of a postulated LOCA in compliance with the requirements of 10 CFR 50.46, "Acceptable Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors."

   Please provide a discussion of the analysis to support the statement that in the event of a LOCA, 1 CSS subsystem, 3 LPCI subsystems, and ADS are sufficient to provide adequate cooling and address how the analysis meets the 10 CFR 50.46 requirements insofar as they relate to the ECCS performance acceptance criteria.