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PSEG Nuclear LLC

10 CFR 50.90

LR-N20-0004
LAR H20-01

June 15, 2020
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: **License Amendment Request: Revise Emergency Core Cooling System Technical Specifications With Respect to High Pressure Coolant Injection System Inoperability**

In accordance with the provisions of 10 CFR 50.90, PSEG Nuclear LLC (PSEG) is submitting a request for an amendment to the Technical Specifications (TS) for Hope Creek Generating Station (HCGS).

The proposed amendment will revise Hope Creek Technical Specification 3/4.5.1, "ECCS Operating," specifically Limiting Condition for Operation (LCO) 3.5.1, Action c, to clarify the entry conditions for the Action and to add a new Action, 3.5.1.c.2.b to address 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 proposed revision is supported by the design of the Hope Creek LPCI system and the overall design basis of the Hope Creek Emergency Core Cooling System (ECCS).

The Enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked up to show the proposed changes. Attachment 2 provides TS Bases markups of the proposed changes for information only.

PSEG requests approval of this license amendment request (LAR) in accordance with standard NRC approval process and schedule. Once approved, the amendment will be implemented within 60 days from the date of issuance.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated State of New Jersey Official.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Mr. Michael Wiwel at 856-339-7907.

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

Executed on June 15, 2020
(Date)

Respectfully,

Paul R. Duke, Jr.
Manager, Licensing
PSEG Nuclear

Enclosure: Evaluation of the Proposed Changes
Attachment 1 Mark-up of Proposed Technical Specification Pages
Attachment 2 Proposed Technical Specification Bases Pages – For Information Only

cc: Administrator, Region I, NRC
NRC Project Manager
NRC Senior Resident Inspector, Hope Creek
Mr. P. Mulligan, Chief, NJBNE
PSEG Corporate Commitment Tracking Coordinator
Station Commitment Tracking Coordinator

Enclosure

Evaluation of the Proposed Changes

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1.0 SUMMARY DESCRIPTION

The proposed amendment will revise Hope Creek Technical Specification (TS) 3/4.5.1, "ECCS Operating," specifically Limiting Condition for Operation (LCO) 3.5.1, Action c, for the entry condition of High Pressure Coolant Injection (HPCI) system inoperability coincident with inoperability of other Emergency Core Cooling System (ECCS) subsystems. The proposed change revises Actions within TS LCO 3.5.1.c to address the plant condition where the HPCI system is inoperable coincident with an inoperable Low Pressure Coolant Injection (LPCI) subsystem and an inoperable Core Spray System (CSS) subsystem. TS Action 3.5.1.c is also reformatted for improved clarity relative to entry conditions. The proposed Action statement provides additional clarity and direction that does not exist in the current structure of Action 3.5.1.c.2 for this plant condition.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The primary function of the safety related ECCS is to automatically provide high pressure and low pressure water injection sources to the reactor vessel to ensure core cooling following a loss of coolant accident (LOCA). The HPCI is a single train cooling system that, coupled with the LPCI system, CSS and Automatic Depressurization System (ADS) comprise the ECCS for the plant.

The HPCI system is designed to provide coolant injection at Reactor Coolant System (RCS) operating pressure to ensure adequate water level within the reactor pressure vessel (RPV) to maintain core coverage in response to a small break LOCA. A small break LOCA in the RCS pressure boundary does not immediately depressurize the RCS to allow injection from the LPCI and CSS subsystems that comprise the low pressure injection sources of the ECCS. The HPCI is a single train system comprised of a constant flow pump assembly coupled to a steam driven turbine, allowing the system to be independent from AC power. HPCI turbine steam is supplied from the 'C' main steam line upstream of the main steam isolation valve. The HPCI system takes suction from either the condensate storage tank (CST) or the suppression pool within containment and injects a minimum flow of 5600 gallons per minute (gpm) into the RPV through one of the CSS injection spargers and one of the feedwater spargers. The system is automatically initiated by logic based on reactor water level and drywell pressure conditions indicative of a LOCA and achieves rated injection flow within 35 seconds. The sensors and logic are powered by divisional safety related DC power.

The HPCI system is also used to maintain reactor vessel inventory following a reactor isolation and coincident failure of the smaller, non-ECCS Reactor Core Isolation Cooling (RCIC) system.

The LPCI system is an operating mode of the residual heat removal system (RHR) that is designed to automatically provide coolant injection at low pressure in response to a LOCA where the RPV is depressurized through the breach in the reactor coolant pressure boundary or through actuation of the ADS. The LPCI system is comprised of four AC powered pumps, each assigned to a dedicated safety related electrical division, which take suction from the suppression pool and injects into the RPV core shroud region via a dedicated injection line and vessel nozzle. Each train is rated to inject 10,000 gpm of flow once the reactor is fully depressurized either through the break itself or via actuation of the ADS. Two of the four LPCI trains (A and B) pass through dedicated heat exchangers cooled by the closed loop Safety Auxiliaries Cooling System (SACS). Each RHR/LPCI train is backed by the designated

emergency diesel generator (EDG) for that division in the event of a loss of offsite power (LOP). The system is automatically initiated by logic based on low reactor water level or high drywell pressure conditions indicative of a LOCA. LPCI actuation occurs on indications of a LOCA however RPV injection does not occur until the RPV is depressurized below a preset permissive limit to open the injection valve in each LPCI train.

The Core Spray System is a safety related system that is designed to automatically provide coolant injection at low pressure in response to a LOCA where the RPV is depressurized through the break in the reactor coolant pressure boundary or via actuation of the ADS. Each CSS subsystem provides a minimum of 6150 gpm at 105 pounds per square inch differential (psid) pressure from the RPV to the suppression pool. The CSS is comprised of two independent subsystems or trains. Each subsystem is comprised of two, fifty percent capacity AC powered pumps that take suction from the suppression pool and inject into the RPV via a dedicated injection line that terminates into a dedicated, peripheral ring spray sparger mounted above the reactor core. Each CSS pump is backed by an assigned emergency diesel generator in the event of a LOP. The system is automatically initiated by logic based on low reactor water level and pressure and high drywell pressure conditions indicative of a LOCA, however RPV injection does not occur until the RPV is depressurized below a preset limit at which point the CSS injection valves automatically open.

The ADS is a safety related system that is designed, after a defined time delay, to automatically depressurize the RPV in response to RPV water level and drywell pressure conditions indicative of a small break LOCA in the event the HPCI system and/or the non-ECCS RCIC system fails or cannot maintain reactor water level. Once the RPV is depressurized, the LPCI system and CSS are then capable to restore RPV level and provide core cooling. The ADS is comprised of five dedicated steam relief valves that vent reactor pressure from the main steam lines from a point upstream of the inboard main steam isolation valves in containment to the suppression pool for steam quenching. Each valve is automatically actuated by redundant solenoids on the valve actuator, with each DC solenoid fed from a separate division of safety logic. Depressurization of the RPV can be achieved independent of AC power, hence the ADS in combination with the CSS and LPCI system is considered the redundant train to the single train HPCI system in the licensing basis of the plant.

2.2 Current Technical Specification Requirements

The current Hope Creek TS affected by the proposed change is associated with Action c to TS LCO 3.5.1 for the condition of an inoperable HPCI system coincident with inoperability of low pressure ECCS subsystems. TS Action Statement 3.5.1.c currently reads as follows:

> c. For the HPCI system, provided the Core Spray System, the LPCI system, the ADS and the RCIC system are OPERABLE:
>
> 1. With the HPCI system inoperable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to $\leq$ 200 psig within the following 24 hours.
>
> 2. With the HPCI system inoperable and either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to operable status within 72 hours or restore the LPCI subsystem/CSS subsystem to operable status within 72 hours. Otherwise be in in HOT SHUTDOWN

within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig in the next 24 hours.

2.3 Reason for Proposed Change

The proposed changes to TS Action 3.5.1.c will provide clear, specific direction for the condition where a LPCI subsystem and a CSS subsystem is inoperable coincident with the HPCI system being inoperable. The current format of TS Action 3.5.1.c.2 is not clear in this regard and may lead to an unwarranted entry into TS 3.0.3 despite design differences between HCGS and the standard boiling water reactor (BWR)-4 design on which the HCGS TS and those in NUREG-1433 were based. TS 3.0.3 allows only one hour to prepare for an orderly shutdown and requires the unit to be in at least STARTUP within the next 6 hours, at least HOT SHUTDOWN within the following 6 hours, and at least COLD SHUTDOWN within the subsequent 24 hours. Entry into TS 3.0.3 for this condition of ECCS inoperability is not warranted given the remaining ECCS capability and the defined allowed outage times (AOT) in both NUREG-1433 and the HCGS TS that address inoperability of structures systems and components (SSCs) with equivalent impact to accident mitigating functions. Adding an allowance of eight hours to restore the HPCI system or the CSS/LPCI subsystem is considered appropriate since an immediate plant shutdown under TS 3.0.3 has the potential for resulting in a unit scram or plant transient that would pose an unwarranted challenge to plant SSCs and reactor operators. The proposed eight hour Completion Time provides a reasonable time to restore one of the systems/subsystems to OPERABLE status or, if necessary, to allow additional time to plan for a controlled unit shutdown.

2.4 Description of Proposed Change

Revise TS Action 3.5.1.c to improve clarity of the Action and to provide an AOT and explicit direction for the condition when both a LPCI and a CSS subsystem are inoperable coincident with the HPCI system being inoperable.

The proposed change to Hope Creek TS Action 3.5.1.c is described below and is indicated on the marked-up TS page provided in Attachment 1 of this enclosure. Deletions are indicated with a strike through and additions are marked in double underlines.

c. For the HPCI system: ~~, provided the Core Spray System, the LPCI system, the ADS and the RCIC systems are OPERABLE~~:

1. With the HPCI system inoperable, provided the Core Spray System, the LPCI system, the ADS and the RCIC system are OPERABLE, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig within the following 24 hours.

2. With the HPCI system inoperable, provided the ADS and the RCIC system are OPERABLE: ~~and either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to operable status within 72 hours or restore the LPCI subsystem/CSS subsystem to operable status within 72 hours. Otherwise, be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig in the next 24 hours~~.

a. With either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to OPERABLE status within 72 hours or restore the LPCI subsystem/CSS subsystem to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to < 200 psig within the following 24 hours.

b. With one LPCI subsystem and one CSS subsystem inoperable, restore the HPCI system to OPERABLE status within 8 hours or restore the LPCI subsystem or CSS subsystem to OPERABLE status within 8 hours or be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to < 200 psig within the following 24 hours.

Attachment 2 of this enclosure includes marked-up TS Bases changes for information only.

3.0 TECHNICAL EVALUATION

The proposed change to Hope Creek TS Action 3.5.1.c provides improved clarity of entry conditions and adds a specific action to address the condition where both a LPCI subsystem and a CSS subsystem become inoperable while the HPCI system is inoperable. The format of the current Action 3.5.1.c is inconsistent relative to the associated entry conditions of Action 3.5.1.c.2. The introductory sentence includes a condition that 'the Core Spray System, the LPCI system, the ADS and the RCIC system are OPERABLE." However, current Action 3.5.1.c.2 provides an AOT for either one inoperable LPCI subsystem or one inoperable CSS subsystem. This lack of clarity relative to inoperability of these ECCS systems and subsystems may lead to entry into TS Action 3.0.3 which would force the plant into an expedited shutdown. The transient plant impacts associated with entry into TS 3.0.3 are not warranted given the enhanced redundancy of the Hope Creek ECCS design relative to the standard BWR-4 ECCS on which the Standard Technical Specifications contained in NUREG-1433 Rev. 4 (Reference 1) are based. The NUREG-1433 Bases describes the LPCI system in the following way:

> "There are two LPCI subsystems (Ref. 2), each consisting of two motor driven pumps and piping and valves to transfer water from the suppression pool to the RPV via the corresponding recirculation loop."

The HCGS LPCI system is comprised of four discrete subsystems as compared to the standard BWR-4 LPCI system, providing increased redundancy available for low pressure injection capability as discussed in further detail in sections 3.1 and 3.2. In addition, there are existing HCGS TS Action statements and recovery times associated with entry conditions of comparable plant impact, specifically TS Action 3.8.3.1.a for an inoperable A.C. electrical distribution channel, that do not require entry into TS Action 3.0.3 as discussed in further detail in section 3.3.

Providing an eight hour completion time to allow for returning either the HPCI system or one of the CSS or LPCI subystems to OPERABLE status is reasonable given the remaining ECCS subsystems available for accident mitigation and the low likelihood of an accident occurring during the eight hour time frame. In the event none of the affected system/subsystems can be

returned to OPERABLE status in the proposed eight hour time frame, the additional time allows for planning a controlled and orderly shutdown resulting in reduced plant risk compared to an expedited shutdown under TS 3.0.3.

3.1 LPCI Design Configuration

The current HCGS TS Action is based on a standard BWR-4 design where the low pressure coolant injection function of RHR is comprised of two LPCI subsystems with each subsystem comprised of two RHR pumps coupled to one vessel injection line. These two LPCI subsystems, in addition to the two subsystems of CSS, comprise the low pressure injection sources available to provide post-LOCA core cooling. The current TS Action 3.5.1.c.2 allows for 72 hours of continued operation with the HPCI system inoperable concurrent with one inoperable subsystem of CSS or one inoperable LPCI subsystem.

The 72-hour Completion Time for NUREG-1433 TS 3.5.1 Condition D (HPCI and one low pressure ECCS injection/spray subsystem inoperable) is based on the above described two subsystem LPCI design and the continued availability of either both subsystems of CSS (with one subsystem of LPCI inoperable) or both subsystems of LPCI (with one subsystem of CSS inoperable) while HPCI is inoperable.

Unlike the standard, two subsystem LPCI configuration on which the both NUREG-1433 and original Standard TS were based, the LPCI configuration at HCGS consists of four RHR pumps with a dedicated vessel injection line for each pump. 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.

3.2 Assessment of High and Low Pressure Vessel Injection Capability

The proposed change allows for an eight hour AOT for the condition where the HPCI system is inoperable concurrent with an inoperable CSS subsystem and an inoperable LPCI subsystem. While in this degraded state of ECCS, operation would be allowed to continue for eight hours based on the remaining ECCS subsystems having the capacity to maintain adequate core cooling in response to either a small break or large break LOCA.

While in the above AOT condition, the following ECCS subsystems are still available to address a loss of coolant accident:

- One Core Spray Subsystem
- Three LPCI Subsystems
- Both actuation divisions of the Automatic Depressurization System

For mitigation of a small break LOCA, ADS capability provides for depressurization of the RPV to allow for coolant injection and core coverage from the remaining low pressure ECCS subsystems. The ADS logic and pilot actuation solenoids are single failure proof to ensure the reliability of the automatic depressurization function. The RCIC system, although not credited in the UFSAR Chapter 15 accident analyses, is also available to automatically provide nominally 600 gpm of injection at reactor operating pressure from the CST on a low reactor level condition in the initial response to a small break LOCA. Based on the ADS design and the remaining low pressure injection subsystems available while in the entry condition for the proposed TS Action 3.5.1.c.2.b, HCGS can still reliably mitigate a small break LOCA and achieve safe shutdown conditions in the unlikely event of a break occurring while in the eight hour AOT.

For mitigation of a large break LOCA, neither the ADS, nor the HPCI or RCIC systems provide credited injection functions since the RCS rapidly depressurizes through the break. The low pressure ECCS subsystems still available while in the proposed new TS Action 3.5.1.c.2.b are still sufficient to provide adequate core cooling in the unlikely event of a large break LOCA during the eight hour AOT timeframe.

Based on the available depressurization and injection sources still available to respond to a small or large break LOCA while in the proposed new TS Action 3.5.1.c.2.b, the ECCS safety function is still maintained.

3.3 Comparison to HCGS TS Actions with Similar Impact to Accident Mitigation

Hope Creek TS 3/4.8.3, Onsite Power Distribution Systems, identifies required LCOs for both the AC and DC safety related electrical buses and associated Actions when a respective LCO is not met. TS 3.8.3.1 Action a states the following:

> "With one of the required A.C. distribution system channels not energized, re-energize the channel within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

The above action statement for TS 3.8.3.1.a is similar to TS 3.8.9 Action A identified in NUREG-1433. The resultant loss of function and impact to plant safety related SSCs when any one of the four safety related AC distribution system channels is deenergized includes loss of a LPCI subsystem, one CSS subsystem, a train of station service water and other supporting safety related SSCs (e.g. MCC's and associated valves, ventilation systems, etc.) powered by that distribution channel. The resultant loss of TS functions while in this Action for loss of an AC distribution system channel is commensurate with the loss of ECCS functionality/redundancy while in the eight hour completion time of the new AOT proposed in TS 3.5.1.c.2.b. Therefore, there is current precedence within the Hope Creek TS, as well as NUREG-1433, for an eight hour completion time relative to restoration from a loss of multiple safety related SSCs which is similar to the restoration of ECCS subsystems described in the proposed AOT.

3.4 Risk Insights for proposed Eight Hour AOT for HPCI System Inoperability Coincident with an Inoperable LPCI Subsystem and an Inoperable CSS Subsystem

Although this license amendment request is not a risk-informed request and a risk evaluation is not required, PSEG is providing risk insights related to the proposed change. This risk analysis was performed to demonstrate with reasonable assurance that the newly proposed AOT is within the current risk acceptance guidelines in Regulatory Guide (RG) 1.174 and RG 1.177.

The risk analysis was based on the ΔCDF and ICCDP, and ΔLERF and ICLERP that results from having a LPCI subsystem inoperable and a CSS subsystem inoperable coincident with HPCI being inoperable. This analysis demonstrates the acceptability, from a risk perspective, of the proposed change to Hope Creek TS 3.5.1.c to allow an eight hour AOT for this degraded condition of ECCS.

3.5 Conclusion

The proposed allowed outage time of eight hours for the condition where the HPCI system is inoperable coincident with inoperability of both a LPCI subsystem and a CSS subsystem will continue to meet the minimum requirements for mitigation of a design basis LOCA.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50, Appendix A, General Design Criteria (GDC)

10 CFR 50.36(c) provides that TS will include Limiting Conditions for Operation (LCOs) which are “the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee will shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.” The proposed change involves revising the structure of TS Action 3.5.1.c and providing an explicit eight hour AOT for the condition where both a LPCI subsystem and CSS subsystem are inoperable coincident with an inoperable HPCI system to avoid an unnecessary entry into TS Action 3.0.3. The LCOs themselves remain unchanged and the required Actions or shut down requirements remain in accordance with 10 CFR 50.36(c). Therefore, the proposed changes are consistent with current regulations.

Although not the direct subject matter of this requested amendment, the following 10 CFR 50, Appendix A, General Design Criterion applies to the systems covered by the proposed changes in this amendment application.

10 CFR 50, Appendix A, General Design Criteria (GDC)

CRITERION 35 – EMERGENCY CORE COOLING
"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."

10 CFR 50.90, "Application for amendment of license or construction permit," addresses the requirements for a licensee desiring to amend its license and the TS incorporated therein. This license amendment request to reformat the Actions within TS 3.5.1.c and provide a specific action to address LPCI subsystem and CSS subsystem inoperability coincident with an inoperable HPCI system has been prepared to meet the requirements of 10 CFR 50.90. Following implementation of the proposed changes, Hope Creek will remain in compliance with the above regulations and guidance.

4.2 Precedent

The following precedent Technical Specification Change Request and associated License Amendment involve a change to the Limerick Generating Station Technical Specifications to provide the same eight hour AOT for the entry condition of an inoperable HPCI system coincident with inoperability of a LPCI subsystem and a CSS subsystem. The Limerick LPCI design is similar to the Hope Creek LPCI system in that it has four independent loops of injection.

1. Letter from PECO Energy to USNRC, August 12, 1994, Technical Specifications Change Request No. 93-23-0, “Revise the Limiting Condition for Operation for the Emergency Core Cooling System Specified in Technical Specifications 3.5.1” (Accession Number 9408180281)

2. Letter from USNRC to PECO Energy Company, June 22, 1995, Issuance of Amendments – Limerick Generating Station, Units 1 and 2 (TAC Nos. M90346 and M90347)(Accession Number 9506300293)

4.3 No Significant Hazards Consideration

The applicable Actions for Hope Creek Generating Station Technical Specification (TS) Limiting Condition of Operability (LCO) 3.5.1.c are revised to reformat the entry conditions for the actions associated with High Pressure Coolant Injection (HPCI) system inoperability for improved clarity. A new TS allowable outage time (AOT), 3.5.1.c.2.b, is added to address the condition where the HPCI system is inoperable coincident with inoperability of a Low Pressure Coolant Injection (LPCI) subsystem and inoperability of a Core Spray System (CSS) subsystem.

PSEG has evaluated the proposed changes to the TS using the criteria in 10 CFR 50.92, and determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change to the TS will not alter the way any structure, system, or component (SSC) functions, and will not alter the manner in which the plant is operated. The proposed change does not alter the design of any SSC. Since no design or operational changes are being made to any SSC, the proposed TS change does not change the accident initiation capability of any of the systems that comprise the Emergency Core Cooling System (ECCS). Therefore, the probability of an accident previously evaluated is not significantly increased.

   The proposed change has no physical or operational impact to any ECCS initiation functions (either automatic or manual) or ECCS setpoints. There are no changes to any analyzed Loss of Coolant Accident (LOCA) ECCS injection pressures or flow rates in the Hope Creek Safety Analyses. In addition, a sufficient number and diversity of ECCS subystems remain available during the proposed AOT to fulfill the ECCS safety function to mitigate a design basis accident (DBA); therefore the consequences of an accident previously evaluated are not increased.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The proposed change does not involve a modification to the physical configuration of the plant or a change in the methods governing normal plant operation. The proposed change

does not impose any new or different requirements or introduce a new accident initiator, accident precursor, or mechanism for equipment malfunction.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No

   The proposed change to the Hope Creek TS will not result in changes to system design or setpoints that are credited in the safety analyses. The proposed change does not impact systems or indications intended to ensure timely identification of plant conditions that could be precursors to accidents or potential degradation of accident mitigation systems.

   The proposed amendment will not result in a design basis or safety limit being exceeded or altered and will maintain sufficient availability of ECCS subsystems to mitigate a DBA. Therefore, since the proposed change does not impact the analyzed response of the plant to a design basis accident, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above, PSEG concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

4.4 CONCLUSIONS

Therefore, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NUREG-1433, Standard Technical Specifications General Electric BWR/4 Plants Revision 4.0

Attachment 1

Mark-up of Proposed Technical Specification Pages

The following Technical Specifications page for Renewed Facility Operating License NPF-57 is affected by this change request:

Technical Specification	**Page**
LCO 3.5.1 Action c	3/4 5-3

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

NOTE: LCO 3.0.4.b is not applicable to HPCI.

No proposed changes. Page included for clarity

a. For the Core Spray system:

1. With one core spray subsystem inoperable, provided that at least two LPCI subsystem are OPERABLE, restore the inoperable core spray subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With both core spray subsystems inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. For the LPCI system:

1. With one LPCI subsystem inoperable, provided that at least one core spray subsystem is OPERABLE, restore the inoperable LPCI subsystem to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With two LPCI subsystems inoperable, provided that at least one core spray subsystem is operable, restore at least one LPCI subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With three LPCI subsystems inoperable, provided that both core spray subsystems are OPERABLE, restore at least two LPCI subsystems to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4. With all four LPCI subsystems inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.*

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* Whenever two or more RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

c. ~~For the HPCI system, provided the Core Spray System, the LPCI system, the ADS and the RCIC system are OPERABLE:~~

Replace with INSERT-A

~~1. With the HPCI system inoperable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig within the following 24 hours.~~

~~2. With the HPCI system inoperable and either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to operable status within 72 hours or restore the LPCI subsystem/CSS subsystem to operable status within 72 hours. Otherwise, be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig in the next 24 hours.~~

d. For the ADS:

1. With one of the above required ADS valves inoperable, provided the HPCI system, the core spray system and the LPCI system are OPERABLE, restore the inoperable ADS valve to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 100 psig within the next 24 hours.

2. With two or more of the above required ADS valves inoperable, be in at least HOT SHUTDOWN within 12 hours and reduce reactor steam dome pressure to ≤ 100 psig within the next 24 hours.

e. With a CSS and/or LPCI header ΔP instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 7 days or determine the ECCS header ΔP locally at least once per 12 hours; otherwise, declare the associated ECCS subsystem inoperable.

f. The discharge line "keep filled" alarm instrumentation associated with a LPCI and/or CSS subsystem(s) may be in an inoperable status for up to 6 hours for required surveillance testing* provided that the "keep filled" alarm instrumentation associated with at least one LPCI or CSS subsystem serviced by the affected "keep filled" system remains OPERABLE; otherwise, perform Surveillance Requirement 4.5.1.a.1.a.

g. In the event an ECCS system is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

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* This includes testing of the "Reactor Coolant System Interface Valves Leakage Pressure Monitors" associated with LPCI and CSS in accordance with Surveillance 4.4.3.2.3

INSERT-A

c. For the HPCI system:

1. With the HPCI system inoperable, provided the Core Spray System, the LPCI system, the ADS and the RCIC system are OPERABLE, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to $\leq$ 200 psig within the following 24 hours.

2. With the HPCI system inoperable, provided the ADS and the RCIC system are OPERABLE:

    a. With either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to OPERABLE status within 72 hours or restore the LPCI subsystem/CSS subsystem to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to $\leq$ 200 psig within the following 24 hours.

    b. With one LPCI subsystem and one CSS subsystem inoperable, restore the HPCI system to OPERABLE status within 8 hours or restore the LPCI subsystem or CSS subsystem to OPERABLE status within 8 hours or be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to $\leq$ 200 psig within the following 24 hours.

Attachment 2

Mark-up of Proposed Technical Specification Bases Pages
For Information Only

The following Technical Specifications Bases pages for Renewed Facility Operating License NPF-57 are affected by this change request:

Technical Specification Bases	Page
3/4.5.1	B3/4 5-2

ECCS - OPERATING (Continued)

With the HPCI system inoperable, adequate core cooling is assured by the OPERABILITY of the redundant and diversified automatic depressurization system and both the CSS and LPCI systems. In addition, the reactor core isolation cooling (RCIC) system, a system for which no credit is taken in the safety analysis, will automatically provide makeup at reactor operating pressures on a reactor low water level condition. The HPCI out-of-service period of 14 days is based on the demonstrated OPERABILITY of redundant and diversified low pressure core cooling systems and the RCIC system. If any one LPCI subsystem or one CSS subsystem is inoperable in addition to an inoperable HPCI system, the inoperable LPCI subsystem/CSS subsystem or the HPCI system must be restored to OPERABLE status within 72 hours. In this condition, adequate core cooling is ensured by the OPERABILITY of the automatic depressurization system (ADS) and the remaining low pressure ECCS subsystems. However, the overall ECCS reliability is reduced because a single failure in one of the remaining OPERABLE subsystems concurrent with a design basis LOCA may result in reduced ECCS capability to perform its intended safety function. Since both a high pressure system (HPCI) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the HPCI system or the LPCI/CSS subsystem to OPERABLE status.

INSERT- B →

The surveillance requirements provide adequate assurance that the HPCI system will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test with reactor vessel injection requires reactor to be in HOT SHUTDOWN with vessel pressure not less than 200 psig. The pump discharge piping is maintained full to prevent water hammer damage and to provide cooling at the earliest moment.

Upon failure of the HPCI system to function properly after a small break loss-of-coolant accident, the automatic depressurization system (ADS) automatically causes selected safety-relief valves to open, depressurizing the reactor so that flow from the low pressure core cooling systems can enter the core in time to limit fuel cladding temperature to less than 2200°F. ADS is conservatively required to be OPERABLE whenever reactor vessel pressure exceeds 100 psig. This pressure is substantially below that for which the low pressure core cooling systems can provide adequate core cooling for events requiring ADS.

ADS automatically controls five selected safety-relief valves although the safety analysis only takes credit for four valves. It is therefore appropriate to permit one valve to be out-of-service for up to 14 days without materially reducing system reliability.

INSERT-B

If the HPCI system is inoperable along with both a LPCI subsystem and a CSS subsystem being inoperable, the overall ECCS reliability to address a design basis LOCA is significantly reduced. The limited availability of ECCS subsystems requires a more restrictive allowed outage time of 8 hours to restore either the HPCI system or the LPCI or CSS subsystems to OPERABLE status due to the overall reduction in defense in depth of the ECCS to fulfill its safety function to respond to an accident condition. The 8 hour completion time takes into account the additional redundancy afforded by the four independent loop design of the Hope Creek LPCI system to still provide a low pressure injection source into the reactor to maintain core cooling and the low likelihood of experiencing a LOCA during the 8 hour completion time.