

Public Service
Electric and Gas
Company

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Vice President and Chief Nuclear Officer

MAR 31 1994

NLR-N94022
LCR 94-01

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

LICENSE AMENDMENT APPLICATION
AOT FOR HPCI AND ONE (1) LOW PRESSURE ECCS INJECTION/SPRAY
SUBSYSTEM
FACILITY OPERATING LICENSE NPF-57
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

This letter submits an application for amendment to Appendix A of Facility Operating License NPF-57 for the Hope Creek Generating Station and is being filed in accordance with 10CFR50.90. The change that is proposed in this submittal would establish an allowed out-of-service time (AOT) of 72 hours for any one low pressure ECCS (Emergency Core Cooling System) injection/spray subsystem inoperable in addition to an inoperable High Pressure Coolant Injection (HPCI) system. Attachment 1 contains a detailed description of, and justification for, the proposed change. Based upon the justification provided, PSE&G believes that the proposed change does not involve a significant hazard consideration pursuant to 10CFR50.92. The technical information contained in Attachment 1 is based upon NUREG-1433, General Electric Company (GE) Standard Technical Specifications for Boiling Water Reactor 4 (BWR/4 STS) Rev. 0 (September 28, 1992). As this change reflects an NRC approved generic change contained in the BWR/4 STS, PSE&G believes that a detailed NRC branch review or specialist review should not be required.

Attachment 2 contains marked up Technical Specification pages which reflect the proposed change. Pursuant to the requirements of 10CFR50.91(b)(1), a copy of this request for amendment has been sent to the State of New Jersey.

Upon NRC approval of this proposed change, PSE&G requests that the amendment be made effective on the date of issuance, but implemented within 60 days to provide sufficient time for associated administrative activities.

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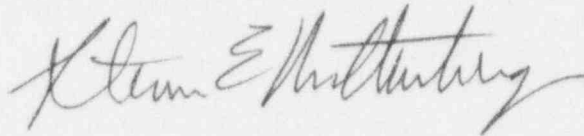
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Should you have any questions regarding this request, we will be pleased to discuss them with you.

Sincerely,



Affidavit
Attachments (2)

C Mr. T. T. Martin, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. J. Stone, Licensing Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. C. Marschall (S09)
USNRC Senior Resident Inspector

Mr. K. Tosch, Manager IV
NJ Department of Environmental Protection
Division of Environmental Quality
Bureau of Nuclear Engineering
CN 415
Trenton, NJ 08625

STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

S. E. Miltenberger, being duly sworn according to law deposes and says:

I am Vice President and Chief Nuclear Officer of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning the Hope Creek Generating Station, are true to the best of my knowledge, information and belief.

S. E. Miltenberger

Subscribed and Sworn to before me
this 31st day of March, 1994

Kimberly Jo Brown
Notary Public of New Jersey

My Commission expires on _____
KIMBERLY JO BROWN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 21, 1998

ATTACHMENT 1
PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

LICENSE AMENDMENT APPLICATION
ACT FOR HPCI AND ONE (1) LOW PRESSURE ECCS INJECTION/SPRAY SUBSYSTEM
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

NLR-N94022
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I. DESCRIPTION OF THE PROPOSED CHANGES

This license amendment application proposes to change Technical Specification (TS) 3/4.5.1, "Emergency Core Cooling Systems - Operating", and its associated Bases such that an Allowed Out-Of-Service Time (AOT) of 72 hours is established for any one low pressure ECCS injection/spray subsystem inoperable in addition to an inoperable HPCI system. Bases Section 3/4.5.1 is revised to reference the BWR/4 STS which justifies the above proposed change to the ECCS - Operating TS. The proposed TS change described above is consistent with the ECCS - Operating Specifications approved in NUREG-1433, BWR/4 STS.

II. REASON FOR THE PROPOSED CHANGES

In the existing ECCS - Operating Technical Specification 3/4.5.1, when the plant is in a condition in which HPCI is inoperable in addition to any other ECCS or the Reactor Core Isolation Cooling (RCIC) system being inoperable, Technical Specification 3.0.3 immediately applies. Technical Specification 3.0.3 requires that Shutdown procedures be initiated within one (1) hour, the plant be in at least STARTUP within the next 6 hours, at least HOT SHUTDOWN within the next 6 hours, and at least COLD SHUTDOWN within the next 24 hours. The proposed Technical Specification change would establish an AOT of 72 hours for HPCI inoperable in addition to any one (1) low pressure injection/spray subsystem, consistent with NUREG-1433, BWR/4 STS.

III. JUSTIFICATION FOR THE PROPOSED CHANGES

A notable difference between the HCGS Technical Specification 3.5.1 and the NUREG-1433 Technical Specification 3.5.1 is the definition of the word subsystem for Low Pressure Coolant Injection (LPCI). Specifically, HCGS has four (4) LPCI subsystems, each consisting of one (1) 100% capacity pump. The NUREG-1433 plant has two (2) LPCI subsystems, each consisting of two (2) 100% capacity pumps. Therefore, two of the HCGS LPCI subsystems are the same as one (1) of the NUREG-1433 plant LPCI subsystem, because each encompasses two (2) pumps.

In the existing TS 3.5.1, if HPCI is found inoperable in Operating Conditions 1, 2, or 3 with the reactor steam dome pressure greater than 200 psig, given all other ECCS and the RCIC system are operable, the HPCI system must be restored to operable status within 14 days or shutdown shall be initiated. In addition, the LCO also requires that with one

LPCI subsystem inoperable, provided that at least one core spray (CS) subsystem is operable, LPCI must be restored to operable status within 30 days. Furthermore, with two LPCI subsystems inoperable, provided that at least one CS subsystem is operable, at least one LPCI subsystem must be restored to operable status within 7 days. With three LPCI subsystems inoperable, provided that both CS subsystems are operable, at least two LPCI subsystems must be restored to operable status within 72 hours. With one CS subsystem inoperable, provided that at least two LPCI subsystems are operable, the TS requires that CS must be restored to operable status within 7 days.

In NUREG-1433, an AOT of 14 days is permitted for HPCI provided that RCIC is operable, an AOT of 7 days is permitted for any one low pressure injection/spray subsystem inoperable, an AOT of 72 hours is permitted for HPCI and one low pressure injection/spray subsystem inoperable coincidentally, and immediate initiation of shutdown procedures is required when two (2) or more low pressure injection/spray subsystem are inoperable.

PSE&G is proposing to incorporate the 72 hour AOT for coincidental inoperability of HPCI and one low pressure injection/spray subsystem, and will retain the existing AOTs for one, two, or three LPCI subsystems inoperable. The justification for this change is based on the following:

The HOGS electrical distribution system that supplies the ECCS equipment with power contains four (4) Emergency Diesel Generators (EDGs) while the electrical distribution system of the NUREG-1433 plant contains only three (3) EDGs. This additional, redundant system adds reliability to the overall electrical distribution system. In NUREG-1433, the loss of one EDG results in the inoperability of two (2) Low Pressure Injection (LPCI) pumps or one (1) LPCI pump and one (1) 100% capacity CS subsystem, whereas the loss of one EDG at HOGS would only result in the inoperability of one LPCI pump and one-half of a CS subsystem (50% capacity). Another design feature of the HOGS LPCI system that makes it more reliable than the plant discussed in NUREG-1433 is that the LPCI system injects directly into the reactor vessel via water boxes mounted inside the core shroud. The LPCI system of the NUREG-1433 plant injects into the reactor vessel via the recirculation loops, 2 LPCI pumps inject into each recirculation loop. Therefore, following a rupture of a recirculation line, a Design Base Accident Loss of Coolant Accident, the NUREG-1433 plant would lose 2 LPCI pumps, while HOGS would maintain all 4 LPCI pumps available for injection. The end result is that, following an assumed loss of a single EDG electrical system, the HOGS plant is left with much more injection capability than the NUREG-1433 plant. For these reasons:

- * the HOGS AOT for one LPCI subsystem inoperable, given at least one CS subsystem is operable, is 30 days as opposed to 7 days as specified in NUREG-1433 and,

- * the HOGS AOT for two LPCI subsystems inoperable, given at least one CS subsystem is operable, is 7 days. This AOT is the same as the AOT in NUREG-1433 for one (1) LPCI subsystem inoperable. However, this AOT is less restrictive than the action required in NUREG-1433 for one (1) LPCI subsystem inoperable with one (1) CS subsystem inoperable, which is immediate entry into Technical Specification 3.0.3., and
- * the HOGS AOT for three LPCI subsystems inoperable, given both CS subsystems are operable, is 72 hours as opposed to immediate entry into Technical Specification 3.0.3 as specified in NUREG-1433.

The NUREG-1433 AOTs would be overly conservative for HOGS, since HOGS has four (4) EDGs and four (4) physically separate channels of electrical power, while the NUREG-1433 plant only has 3 EDGs. HOGS has greater capability to supply power to its ECCS in an emergency than the NUREG-1433 plant. Similarly, the incorporation of an AOT of 72 hours for HPCI and one low pressure injection/spray subsystem as proposed in NUREG-1433 would also be conservative for HOGS.

In the HOGS safety analysis, the small break Loss of Coolant Accident (LOCA) is the design basis event for the HPCI system. The most limiting single failure coincident with a large or small break LOCA is the failure of the DC source (Channel A) common to the HPCI system, one CS subsystem, and one LPCI subsystem. The change made by this submittal would establish a 72 hour AOT for either one LPCI subsystem or one CS subsystem to be inoperable coincident with HPCI being inoperable. As discussed above, if an initiating event occurs while in the proposed AOT for the ECCS, the resulting scenario would be within the design basis of the HOGS. Even with a failure of one CS subsystem while HPCI and LPCI are in a 72 hour LCO or a failure of one LPCI subsystem while HPCI and CS are in a 72 hour LCO, HOGS would still be within its design basis if an initiating event occurred. Adequate core cooling is ensured by the operability of the ADS and the remaining low pressure injection/spray subsystems.

The loss of feedwater flow transient analyzed in Chapter 15 of the HOGS UFSAR assumes both the HPCI and RCIC system to be operable. The existing TS for HPCI allow the system to be inoperable for up to 14 days. Sufficient injection capability is assured because the RCIC system will be required to be operable if the HPCI is inoperable. For this transient, the proposed 72 hour AOT for the HPCI and one low pressure injection/spray subsystem inoperable present no challenge greater than the existing 14 day HPCI AOT.

For the steam line breaks outside of containment, the HPCI system is assumed unavailable. For feed line breaks outside of containment, either the HPCI or RCIC systems are capable of providing adequate cooling to the vessel to prevent cladding damage. The RCIC system will be required to be operable during the proposed 72 hour AOT.

Therefore, a 72 hour AOT for HPCI and one low pressure injection/spray subsystem is justified.

The Core Damage Frequency (CDF) at HOGS is calculated based on Probabilistic Risk Assessment (PRA) models using present Technical Specifications that do not allow simultaneous outages of either HPCI and one LPCI subsystem or HPCI and one CS subsystem. The proposed action statement, which would allow 72 hours of plant operation with the HPCI system inoperable coincident with one low pressure ECCS injection/spray subsystem (LPCI or CS) inoperable, was determined to have a potential impact on 28 of the core damage sequences. These 28 core damage sequences were requantified with a new model (based on the proposed action statement that would allow the simultaneous outage). The affects on the CDF of the 28 sequences were deemed to be negligible. All sequences remained below a CDF of $1E-10$. This outcome is expected, since having HPCI and one low pressure injection/spray subsystem inoperable for 72 hours still leaves five low pressure injection/spray subsystems and the RCIC system available.

Finally, implementation of this proposed change would reduce unnecessary plant shutdowns without commensurate effects on safety and minimize associated challenges to safety systems.

IV. SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

PSE&G has, pursuant to 10 CFR 50.92, reviewed the proposed amendment to determine whether the request involves a significant hazards consideration. We have determined that operation of the Hope Creek Generating Station in accordance with the proposed changes:

1. Will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change establishes a 72 hour Allowed Out-of-Service Time (AOT) for coincidental High Pressure Coolant Injection system (HPCI) and one low pressure injection/spray subsystem inoperability, in accordance with NUREG-1433. In addition, PSE&G will justify retaining the existing HOGS AOTs for one, two, and three Low Pressure Coolant Injection (LPCI) subsystems inoperable.

The HOGS electrical distribution system that supplies the ECCS (Emergency Core Cooling System) equipment with power contains four (4) Emergency Diesel Generator (EDGs) while the electrical distribution system of the NUREG-1433 plant contains only three (3) EDGs. This additional, redundant system adds reliability to the overall electrical distribution system. In NUREG-1433, the loss of one EDG (Emergency Diesel Generator) results in the inoperability of two (2) Low Pressure Injection (LPCI) pumps or one (1) LPCI and one (1) 100% capacity CS subsystem, whereas the loss of one EDG at HOGS would only result in the inoperability of one LPCI pump and one-half of a CS subsystem (50% capacity). Another design feature of the HOGS LPCI system that makes it more reliable than the plant discussed in NUREG-1433 is that the LPCI system injects directly

into the reactor vessel via water boxes mounted inside the core shroud. The LPCI system of the NUREG-1433 plant injects into the reactor vessel via the recirculation loops, 2 LPCI pumps inject into each recirculation loop. Therefore, following a rupture of a recirculation line, a Design Base Accident Loss of Coolant Accident, the NUREG-1433 plant would lose 2 LPCI subsystems, while HOGS would maintain all 4 LPCI subsystems available for injection. The end result is that, following assumed loss of a single EDG electrical system, the HOGS plant is left with much more injection capability than the NUREG-1433 plant. For these reasons:

- * the HOGS AOT for one LPCI subsystem inoperable, given at least one CS subsystem is operable, is 30 days as opposed to 7 days as specified in NUREG-1433, and
- * the HOGS AOT for two LPCI subsystems inoperable, given at least one CS subsystem is operable, is 7 days. This AOT is the same as the AOT in NUREG-1433 for one (1) LPCI subsystem inoperable. However, this AOT is less restrictive than the action required in NUREG-1433 for one (1) LPCI subsystem inoperable with one (1) CS subsystem inoperable, which is immediate entry into Technical Specification 3.0.3., and
- * the HOGS AOT for three LPCI subsystems inoperable, given both CS subsystems are operable, is 72 hours as opposed to immediate entry into Technical Specification 3.0.3 as specified in NUREG-1433.

NUREG-1433 would be overly conservative for HOGS, since HOGS has four (4) EDGs and four (4) physically separate channels of electrical power, while the NUREG-1433 plant only has 3 EPCs. HOGS has greater capability to supply power to its ECCS in an emergency than the NUREG-1433 plant. Similarly, the incorporation of an AOT of 72 hours for HPCI and one low pressure injection/spray subsystem as proposed in NUREG-1433 would also be conservative for HOGS.

In the HOGS safety analysis, the small break LOCA is the design basis event for the HPCI system. The most limiting single failure coincident with a large or small break LOCA is the failure of the DC source (Channel A) common to the HPCI system, one CS subsystem, and one LPCI subsystem. The change made by this submittal would establish a 72 hour AOT for either one LPCI subsystem or one CS subsystem to be inoperable coincident with HPCI being inoperable. As discussed above, if an initiating event occurs while in the proposed AOT for the ECCS, the resulting scenario would be within the design basis of the HOGS. Even with a failure of one CS subsystem while HPCI and LPCI are in a 72 hour LCO or a failure of one LPCI subsystem while HPCI and CS are in a 72 hour LCO, HOGS would still be within its design basis if an initiating event occurred. Adequate core cooling is ensured by the operability of the ADS and the remaining low pressure injection/spray subsystems.

The loss of feedwater flow transient analyzed in Chapter 15 of the HOGS UFSAR assumes both the HPCI and RCIC systems to be operable. The existing TS for HPCI allows the system to be inoperable for up to 14 days. Sufficient injection capability is assured because the RCIC system will be required to be operable if the HPCI is inoperable. For this transient, the proposed 72 hour AOT for the HPCI and one low pressure injection/spray subsystem inoperable presents no challenge greater than the existing 14 day HPCI AOT.

For the steam line breaks outside of containment, the HPCI system is assumed unavailable. For feed line breaks outside of containment, either the HPCI or RCIC systems are capable of providing adequate cooling to the vessel to prevent cladding damage. The RCIC system will be required to be operable during the proposed 72 hour AOT.

The Core Damage Frequency (CDF) at HOGS is calculated based on Probabilistic Risk Assessment (PRA) models using present Technical Specifications that do not allow simultaneous outages of either HPCI and one LPCI subsystem or HPCI and one CS subsystem. The proposed action statement, which would allow 72 hours of plant operation with the HPCI system inoperable coincident with one low pressure ECCS injection/spray subsystem (LPCI or CS) inoperable, was determined to have a potential impact on 28 of the core damage sequences. These 28 core damage sequences were requantified with a new model (based on the proposed action statement that would allow the simultaneous outage), and none of the frequencies of the 28 sequences were significantly affected.

In addition, the probability of an accident is not affected because no physical modifications are being made to the plant.

Finally, implementation of this proposed change would reduce unnecessary plant shutdowns without commensurate effects on safety and minimize associated challenges to safety systems.

2. Will not create the possibility of a new or different kind of accident from any accident previously evaluated.

Establishing an AOT of 72 hours for the HPCI system inoperable in addition to any one (1) low pressure injection/spray subsystem does not alter the function of the equipment nor involve any type of plant modification. Additionally, no new modes of plant operation are involved with these changes. The proposed change therefore will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Will not involve a significant reduction in a margin of safety.

The basis for this statement is outlined in item 1 above.

V. CONCLUSION

As discussed above, PSE&G has concluded that the proposed changes to the Technical Specifications do not involve a significant hazards consideration since the changes: (i) do not involve a significant increase in the probability or consequences of an accident previously evaluated, (ii) do not create the possibility of a new or different kind of accident from any accident previously evaluated, and (iii) do not involve a significant reduction in a margin of safety.

VI. REFERENCES

1. NUREG-1433, Standard Technical Specifications for General Electric Plants, BWR/4, dated September 1992.
2. Memorandum from R. L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LOOs for ECCS Components," December 1, 1975.
3. PSE&G Internal Memorandum SCI-94-0048 from Jeff Leary, Nuclear Engineering Sciences, to L. Castagna, Nuclear Licensing, dated January 20, 1994.

ATTACHMENT 2

TECHNICAL SPECIFICATION PAGES WITH PEN AND INK CHANGES

LICENSE AMENDMENT APPLICATION 94-01, NLR-N94022
STI/AOT EXTENSIONS FOR SELECTED INSTRUMENTATION
FACILITY OPERATING LICENSE NPF-57
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

The following Technical Specifications have
been revised to reflect the proposed changes:

<u>Technical Specification</u>	<u>Page</u>
3.5.1.c	3/4 5-3
3/4.5.1 Bases	B 3/4 5-2