Public Service
Electric and Gas
Company

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LCR H98-05

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

Gentlemen:

REQUEST FOR LICENSE AMENDMENT
SINGLE CELL CHARGING SAFETY RELATED BATTERIES
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

In accordance with 10CFR50.90, Public Service Electric & Gas Company (PSE&G) hereby requests amendment to the Facility Operating License for the Hope Creek Generating Station. In accordance with 10CFR50.91(b), a copy of this request has been sent to the State of New Jersey.

An evaluation performed in accordance with 10CFR50.59 concluded that the use of a single cell battery charger on a safety related battery while the battery remains OPERABLE involves an Unreviewed Safety Question (USQ) since the possibility for a malfunction of a different type than any previously evaluated in the safety analysis report may be created. 10CFR50.59(c) requires that the licensee shall submit an application for amendment of its operating license for any changes to procedures involving a USQ.

The proposed changes have been evaluated in accordance with 10 CFR 50.91(a)(1), using the criteria in 10 CFR 50.92(c); and a determination has been made that the USQ involves no significant hazards considerations. The basis for approval of the USQ condition is provided in Attachment 1 to this letter. A 10 CFR 50.92 evaluation for the USQ condition, with a determination of no significant hazards consideration, is provided in Attachment 2. The marked up Facility Operating License page affected by the proposed change is provided in Attachment 3.

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Upon NRC approval of this proposed change, PSE&G requests that the amendment to Appendix C to the Operating License be made effective upon the date of issuance, but allow an implementation period of sixty days to provide sufficient time for associated administrative activities.

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

Sincerely,

E C Simpson

Affidavit
Attachments (3)

C Mr. H. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
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Mr. R. Ennis, Licensing Project Manager - Hope Creek
U. S. Nuclear Regulatory Commission
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Mr. S. Pindale (X24)
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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

E. C. Simpson, being duly sworn according to law deposes and says:

I am Senior Vice President - Nuclear Engineering of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning Hope Creek Generating Station, Unit 1, are true to the best of my knowledge, information and belief.

E C Simpson

Subscribed and Sworn to before me
this 8th day of September, 1998

Kimberly J. Brown
Notary Public of New Jersey

My Commission expires on 6/10/2003

HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354
SINGLE CELL CHARGING SAFETY RELATED BATTERIES

BASIS FOR REQUESTED CHANGE:

REQUESTED CHANGE AND PURPOSE

The proposed change would permit the use of non-Class 1E single cell battery chargers, with proper electrical isolation, for charging connected cells in OPERABLE class 1E batteries. The single cell charger would be used to restore individual cell float voltage to the normal limit specified in Technical Specifications.

BACKGROUND:

The class 1E dc system is described in Hope Creek Updated Final Safety Analysis Report (UFSAR) section 8.3.2. The system consists of four independent 125 V dc systems and two independent 250 V dc systems. Under normal operating conditions, the installed Class 1E battery charger supplies the operating dc loads and a float charge to the battery. The ac power for the battery charger in each independent dc system is supplied from a motor control center in the same channel as that of the battery the charger is supplying. Each installed battery charger has an input ac and output dc circuit breaker for isolation. Each charger is designed to prevent the ac supply from becoming a load on the battery due to a power feedback as a result of the loss of ac power to the charger. The battery chargers are capable of supplying the largest combined demand of the various continuous steady-state loads plus charging capacity to restore the associated battery.

An equalizing charge applied to the entire battery bank is the normal corrective action to restore the battery from a condition involving low cell voltage or low specific gravity. The effectiveness of an equalizing charge decreases when only a single cell or a small number of cells require equalizing. A more effective method of restoring the battery in that case is to perform single cell battery charging.

An evaluation performed in accordance with 10CFR50.59 concluded that the use of a single cell battery charger on a safety related battery while the battery remains OPERABLE involves an Unreviewed Safety Question (USQ) since the possibility for a malfunction of a different type than any previously evaluated in the safety analysis report may be created.

JUSTIFICATION OF REQUESTED CHANGES:

The OPERABILITY of the Class 1E batteries during operation ensures that sufficient power will be available to supply the safety related equipment required for (1) the safe shutdown of the facility and (2) the mitigation and control of accident conditions within the facility. The surveillance requirements for demonstrating the OPERABILITY of the Class 1E batteries are in accordance with the recommendations of Regulatory Guide 1.129 "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978 and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Technical Specification Table 4.8.2.1-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The normal limits ensure the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8.2.1-1 is permitted for up to 31 days. During this 31 day period, the allowable values ensure the battery's capability to perform its design function. The 31 day ACTION time was derived taking into consideration that while battery capacity is degraded, sufficient capacity exists to perform the intended function while providing a time period adequate to permit full restoration of the battery cell parameters to normal limits.

The requested change implements an industry accepted practice for raising the voltage of an individual cell or of a small number of cells without affecting the remainder of the cells in the battery. IEEE Std 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead Storage Batteries for Stationary Applications," states that single cell charging is an acceptable method of correcting low cell voltage or low specific gravity conditions for a single cell or for a small number of cells. The NRC previously reviewed the use of non-safety grade battery chargers for Class 1E battery banks at the Virgil C. Summer Nuclear Station and found it to be acceptable in a Safety Evaluation Report provided to the licensee in a letter dated December 20, 1989.

At least two class 1E fuses in series will be used on both the positive and negative leads between the battery and the charger to protect the battery if a fault should develop in the charger. The battery charger design includes diodes, a power transformer and control circuitry to prevent draining the connected cells in the event of a short circuit in the 120 Volt ac source or a loss of charger input or output voltage. Charger output is controlled automatically to prevent overcharging the connected cells.

Based upon experience in charging individual cells in non-1E battery banks and upon a review of industry operational experience reports, PSE&G believes that failure of a single cell charger resulting in a loss of a battery due to an open circuit condition is highly unlikely. However, in the event of a charger controller failure resulting in charger overvoltage, procedural controls governing the use of the charger will ensure the condition is detected and corrected before failure of a connected cell occurs. While the single cell charger is connected, procedures will require periodic checks to verify proper charger operation and to measure electrolyte level, temperature and specific gravity for the cells being charged. Monitoring will be performed at least once every eight hours, a frequency sufficient to ensure compliance with the ACTION requirements of Technical Specification 3.8.2.1. Operator actions during single cell charging are similar to those currently performed during equalizing charges applied to the entire battery bank.

Single cell charging would be limited to one OPERABLE class 1E battery bank at a time. Therefore, failure of a class 1E battery as a result of single cell charging would be limited to a single channel and would not reduce the number of OPERABLE dc sources below that required to safely shutdown the plant. Administrative controls would also prohibit the use of single cell charging for an OPERABLE class 1E battery if less than the minimum number of class 1E batteries required by Technical Specifications are OPERABLE.

An insulating material will be used to minimize the possibility of shorting leads or clips at the battery. Administrative controls governing the use and storage of transient loads are sufficient to ensure the use of single cell battery chargers does not create a potential missile hazard to safety related systems, structures and components.

Cells that have been charged using single cell chargers will be checked weekly for four weeks after single cell charging. This increase in surveillance frequency, together with PSE&G's corrective action program which requires degraded and non-conforming conditions to be documented and evaluated, provides assurance that the use of single cell charging will not cause long-term cell degradation to go undetected.

CONCLUSIONS:

The requested change permits the use of an industry accepted method to restore individual connected cell parameters to the normal values specified in Technical Specifications. The potential to adversely affect the Class 1E batteries is minimized by the use of Class 1E fuses and by appropriate administrative controls.

HOPE CREEK GENERATING STATION
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10 CFR 50.92 EVALUATION

Public Service Electric & Gas (PSE&G) has concluded that the Unreviewed Safety Question does not involve a significant hazards consideration. In support of this determination, an evaluation of each of the three standards set forth in 10 CFR 50.92 is provided below.

REQUESTED CHANGE

The proposed change permits the use of non-Class 1E single cell battery chargers, with proper electrical isolation, for charging connected cells in OPERABLE class 1E batteries.

BASIS

1. *The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.*

   The proposed change permits the use of an industry accepted method to restore a battery cell to its design basis from an OPERABLE but degraded condition or to prevent a cell from becoming degraded. IEEE Std 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead Storage Batteries for Stationary Applications," states that single cell charging is an acceptable method of correcting low cell voltage or low specific gravity conditions for a single cell or for a small number of cells.

   At least two class 1E fuses in series will be used on both the positive and negative leads between the battery and the charger to protect the battery if a fault should develop in the charger. The battery charger design includes diodes, a power transformer and control circuitry to prevent draining the connected cells in the event of a short circuit in the 120 Volt ac source or a loss of charger input or output voltage. Charger output is controlled automatically to prevent overcharging the connected cells.

   In the event of a controller failure resulting in charger overvoltage, procedural controls governing the use of the charger ensure the condition is detected and corrected before failure of a connected cell occurs. While the single cell charger is

connected, procedures will require periodic checks to verify proper charger operation and to measure electrolyte level, temperature and specific gravity for the cells being charged. Monitoring will be performed at least once every eight hours, a frequency sufficient to ensure compliance with the ACTION requirements of Technical Specification 3.8.2.1.

An insulating material will be used to minimize the possibility of shorting leads or clips at the battery. Administrative controls governing the use and storage of transient loads are sufficient to ensure the use of single cell battery chargers does not create a potential missile hazard to safety related systems, structures and components.

The Class 1E dc system is not an accident initiator. It supports the operation of safety related equipment required for the safe shutdown of the plant and for the mitigation of accident conditions. Therefore, the proposed change does not increase the probability of an accident previously evaluated.

The station's dc systems will be operable to mitigate the consequences of an accident previously evaluated. Single cell charging would be limited to one OPERABLE class 1E battery bank at a time. Therefore, failure of a class 1E battery as a result of single cell charging would be limited to a single channel and would not reduce the number of OPERABLE dc sources below that required to safely shutdown the plant. Administrative controls would also prohibit the use of single cell charging for an OPERABLE class 1E battery if less than the minimum number of class 1E batteries required by Technical Specifications are OPERABLE.

The proposed change does not cause the capability of the class 1E dc system to be degraded below the level assumed for any accident described in the SAR. It would enhance the availability of safety related equipment required for the safe shutdown of the plant and for the mitigation of accident conditions. Therefore the radiological consequences of an accident will remain inside the design basis while single cell charging is performed on an OPERABLE battery.

2. *The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The potential to adversely affect the Class 1E batteries is minimized by the use of Class 1E fuses and by appropriate administrative controls. Failure modes associated with the proposed change are bounded by the loss of a Class 1E battery bank which was previously evaluated. Therefore, the proposed change does not

create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *The proposed change does not involve a significant reduction in a margin of safety.*

The proposed change permits the use of non-Class 1E single cell battery chargers, with proper electrical isolation, for charging connected cells in OPERABLE class 1E batteries. This would allow parameters for an individual cell or for a small number of cells to be restored to the normal values specified in Technical Specifications without affecting the remainder of the cells in the battery. Increased cell monitoring after single cell charging, together with PSE&G's corrective action program which requires degraded and non-conforming conditions to be documented and evaluated, provides assurance that the use of single cell charging will not cause long-term cell degradation to go undetected. Since all battery cells are required to be maintained within the allowable values specified in Technical Specifications, and since the use of the single cell charger will not adversely affect battery capacity or capability, the proposed change does not involve a significant reduction in the margin of safety.

CONCLUSION

Based on the above, PSE&G has determined that the proposed change does not involve a significant hazards consideration.