Public Service
Electric and Gas
Company

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March 26, 1986

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

Attention: Ms. Elinor Adensam, Director
Project Directorate 3
Division of BWR Licensing

Dear Ms. Adensam:

CONFORMANCE TO REGULATORY GUIDE 1.32
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

Pursuant to a meeting on March 20, 1986 with the NRC Power Systems Branch; Public Service Electric and Gas Company (PSE&G) hereby submits proposed changes to the Hope Creek Generating Station (HCGS) Final Safety Analysis Report (FSAR) to clarify compliance to NRC Regulatory Guide 1.32.

The enclosed FSAR changes provide a detailed description of HCGS compliance with Regulatory Guide 1.32, Position C.1.b regarding battery charger design capacity. These FSAR revisions will be incorporated in FSAR Amendment 15 after fuel load.

If there are any questions, do not hesitate to contact us.

Sincerely,

Attachment

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C D.H. Wagner
USNRC Licensing Project Manager

R.W. Borchardt
USNRC Senior Resident Inspector

Sang Rhow
NRC Power Systems Branch

1.8.1.32 Conformance to Regulatory Guide 1.32, Revision 2, February 1977: Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants

Although Regulatory Guide 1.32 is not applicable to HCGS, per its implementation section, HCGS complies with IEEE 308-1974, as endorsed and modified by Regulatory Guide 1.32, subject to the clarification of Position C.1.d and C.1.f. C.1.b,

Position C.1.d of Regulatory Guide 1.32 references Regulatory Guide 1.75. HCGS compliance to this Regulatory Guide is discussed in Section 1.8.1.75.

Position C.1.f of Regulatory Guide 1.32 references Regulatory Guide 1.9. HCGS compliance to this Regulatory Guide is discussed in Section 1.8.1.9.

See Chapter 8 for further discussion of the electrical system and Section 1.8.2 for the NSSS assessment of this Regulatory Guide.

1.8.1.33 Conformance to Regulatory Guide 1.33, Revision 2, February 1978: Quality Assurance Program Requirements (Operation)

HCGS complies with ANSI N18.7-1976/ANS-3.2, as endorsed and modified by Regulatory Guide 1.33. The contents of the plant operating procedures will comply with the applicable requirements of Section 5.3 of ANSI/ANS-3.2-1982. See Section 17.2 for further discussion of quality assurance during plant operation.

1.8.1.34 Conformance to Regulatory Guide 1.34, Revision 0, December 28, 1972: Control of Electroslag Weld Properties

Regulatory Guide 1.34 is not applicable to HCGS because the process is not used.

See Section 1.8.2 for the NSSS assessment of this Regulatory Guide.

HCGS complies with Position C.1.b of Regulatory Guide 1.32 as discussed in Section 8.3.2.2.

8.3.2.1.2.3 Class 1E Battery Chargers

The battery chargers are full-wave, silicon-controlled rectifiers. The chargers are suitable for float-charging their respective lead-calcium batteries. The chargers operate from a 480-V 3-phase, 60-hertz power supply. The chargers are supplied from MCCs of the same channel as the battery system channel it supplies.

Battery chargers associated with a battery are capable of supplying the largest combined demand of the various continuous steady-state loads plus charging capacity to restore the battery from the charge state at the completion of their design duty cycle (design minimum charge) to the fully charged state within 12 hours.

¶ → Insert Attached.

8.3.2.1.2.4 Class 1E Battery Loads

The loads supplied by each Class 1E battery system, along with its length of operation during a loss of all ac power, are shown in Tables 8.3-7 through 8.3-10 and Figure~~s~~ 8.3-~~8 and 8.3-10~~ 16.

Loads are divided among different battery systems so that each system serves loads that are identical and redundant, are different from but redundant to plant safety, or are backup equipment to the ac-driven equipment.

8.3.2.1.2.5 Separation and Ventilation

For each Class 1E dc system, the battery bank, chargers, and dc switchgear are located in separate compartments of the Seismic Category I auxiliary building. The battery compartments are ventilated by a system that is designed to preclude the possibility of hydrogen accumulation. Section 9.4 describes the ventilation system in the battery rooms. Redundant dc systems are separated to minimize the likelihood of a single hazard causing the loss of more than one channel.

INSERT TO FSAR PAGE 8.3-42

Tables 8.3-7 through 8.3-10 show various transient and steady state battery loads grouped into specific time increments. The listed load levels are not continuous steady state loads for the entire time period listed. The indicated load levels are maximum current levels experienced during that particular time increment, and some are of a shorter duration than the actual time increment in which they appear.

Loads which are not considered as continuous steady state loads are momentary loads such as switchgear control operations, motor operated valve operations, motor starting currents and various inrush currents. Momentary loads are supplied from the battery when such loads exceed the maximum output of the battery charger. In addition, inverters are not considered as continuous steady state loads because they are normally supplied from AC power sources and are not from the battery charger.

Thus sufficient independence and redundancy exists between the Class 1E dc systems to ensure performance of minimum safety functions, assuming a single failure. Spare battery chargers are provided to replace any of the Class 1E chargers.

Independence of redundant dc systems is discussed in Section 8.3.2.2.a.

d. → Insert Attached.

~~d.~~ e. Regulatory Guide 1.41, Preoperational Testing of Redundant Onsite Electric Power Systems to Verify Proper Load Group Assignments, March 1973 - The Class 1E dc systems have been designed in accordance with Regulatory Guides 1.6 and 1.32, and testing capabilities are provided in accordance with the guidance of Regulatory Guide 1.41.

These systems are tested as follows:

1. Testing of the dc power system, including an acceptance test of battery capacity, is performed before unit operation in accordance with the requirements described in Chapter 14.

2. The charger, battery connections, and charger supply are verified for proper assignment of ac load groups.

3. Class 1E dc systems are functionally tested along with the associated ac load groups by disconnecting and isolating the other ac load groups, its ac power sources, and the associated dc system. Each test includes simulation of an engineered safety features (ESF) actuation signal, startup of the SDG and the load group under test, sequencing of loads, and the functional performance of the loads. During these tests, the ability of the dc system to perform its intended functions, e.g., control of SDGs and Class 1E ac switchgear, is verified.

4. During the testing of the Class 1E dc system and its associated ac load group, the buses and loads of the dc systems associated with other ac load

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d. Regulatory Guide 1.32, Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants, February 1977 - Position C.1.b states that the capacity of the battery charger supply should be based on the largest combined demands of the various continuous steady-state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the plant during which these demands occur. For the 125V-dc system, HCGS complies with this position by clarifying uninterruptible power supply inverter (UPS) operation with respect to DC bus loading. Following a loss of all AC power the UPS inverters are powered directly from their respective battery. Upon restoration of AC power, the UPS inverters are powered from the same Class 1E AC bus as their associated battery charger. During normal plant operation with AC power available the UPS inverters are powered from either one of their two associated 480-V (MCC) power supplies. As a result, with respect to battery charger calculated design capacity, the UPS inverters are not included as an electrical load on the DC bus. The design continuous steady-state load is defined as only those electrical loads which are supplied soley by the batteries. Based on the above clarification, HCGS complies with Regulatory Guide 1.32, Position C.1.b.

groups not under test are monitored to verify the absence of voltage, indicating no interconnections of redundant dc systems.

f. Regulatory Guide 1.93, Availability of Electric Power Sources - Compliance with Regulatory Guide 1.93 is discussed in Section 1.8.

g. Regulatory Guide 1.128, Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants, October 1978 - Compliance with Regulatory Guide 1.128 is discussed in Sections 1.8.

h. Regulatory Guide 1.129, Maintenance, Testing, and Replacements of Large Lead Storage Batteries for Nuclear Power Plants, February, 1978 - Regulatory Guide 1.129 endorses IEEE 450-1975, with clarifications. Recommended practices of IEEE-450 for maintenance, testing, and replacement of batteries are followed for the Class 1E batteries and are discussed in Chapter 16.

i. IEEE 308-1974, IEEE Standard Criteria for Class 1E Electric Systems for Nuclear Power Stations - The Class 1E dc system provides dc electric power to the Class 1E loads and for control and switching of the Class 1E systems. Physical separation and redundancy is provided to prevent the occurrence of common mode failures. The design of the Class 1E dc system includes the following:

1. The dc system is separated into four independent channels.

2. The safety actions by each group of loads are independent of the safety actions provided by each group's redundant counterparts.

3. Each dc subsystem includes power supplies that consist of one battery bank, and one or two battery chargers, as required.