New Hampshire Yankee

George S. Thomas Vice President-Nuclear Production

NYN-89038

April 17, 1989

United States Nuclear Regulatory Commission Washington, DC 20555

Attention: Document Control Desk

References: (a) Facility Operating License No. NPF-56, Docket No. 50-443

(b) Station Blackout Final Rule, 10 CFR 50.63, as published in the Federal Register June 21, 1988

Subject: Information Submittal Required by 10 CFR 50.63

### Gentlemen:

On July 21, 1988, the Nuclear Regulatory Commission (NRC) amended its regulations in 10 CFR Part 50. A new section, 50.63, was added which requires that each light-water-cooled nuclear power plant be able to withstand and recover from a station blackout (SBO) of a specified duration. Utilities are expected to have the baseline assumptions, analyses and related information used in their coping evaluation available for NRC review. It also identifies the factors that must be considered in specifying the station blackout duration. Section 50.63 requires that, for the station blackout duration, the plant be capable of maintaining core cooling and appropriate containment integrity. Section 50.63 further requires that each licensee submit the following information:

- A proposed station blackout duration including a justification for the selection based on the redundancy and reliability of the onsite emergency AC power sources, the expected frequency of loss of offsite power, and the probable time needed to restore offsite power;
- 2. A description of the procedures that will be implemented for Station blackout events for the duration (as determined in 1 above) and for recovery therefrom; and
- 3. A list of any needed modifications to equipment and associated procedures necessary to meet the specified SBO duration, and a proposed schedule for implementing the modifications.

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The NRC has issued Regulatory Guide 1.155 "Station Blackout" which describes a means acceptable to the NRC Staff for meeting the requirements of 10 CFR 50.63. Regulatory Guide (RG) 1.155 states that the NRC Staff has determined that NUMARC 87-00 "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout At Light Water Reactors" also provides guidance that is in large part identical to the RG 1.155 guidance and is acceptable to the NRC Staff for meeting these requirements. Table 1 to RG 1.155 provides a cross-reference between RG 1.155 and NUMARC 87-00 and notes where the RG takes precedence.

New Hampshire Yankee has evaluated Seabrook Station Unit 1 against the requirements of the SBO rule using guidance from NUMARC 87-00 except where RG 1.155 takes precedence. The results of this evaluation are detailed below. (Applicable NUMARC 87-00 sections are shown in parenthesis.)

### A. Proposed Station Blackout Duration

NUMARC 87-00, Section 3, was used to determine that a proposed SBO duration of four hours is applicable for Seabrook Station. No equipment modifications are required to attain this proposed coping duration category.

The following plant factors were identified in determining the proposed station blackout duration:

- 1. AC Power Design Characteristics Group P2 is based on
  - Expected frequency of grid-related loss of offsite power does not exceed once per 20 years (Section 3.2.1, Part 1A, p. 3-3);
  - Estimated frequency of loss of offsite power due to extremely severe weather places the plant in ESW Group 3 (Section 3.2.1, Part 1B, p. 3-4);
  - c. Estimated frequency of loss of offsite power due to severe weather places the plant in SW Group 3 (Section 3.2.1, Part 1C, p. 3-7);
  - d. The offsite power system is in the I1/2 Group (Section 3.2.1, Part 1D, p. 3-10).
- The emergency AC power configuration group C (Section 3.2.2, Part 2C, p. 3-13) is based on
  - a. There are two emergency AC power supplies not credited as alternate AC power sources (Section 3.2.2, Part 2A, p. 3-15);
  - b. One emergency AC power supply is necessary to operate safe shutdown equipment following a loss of offsite power (Section 3.2.2, Part 2B, p. 3-15).

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- 3. A target EDG reliability of 0.975 was selected consistent with NUMARC 87-00, Section 3.2.4 and based on
  - a. Having a nuclear unit average EDG reliability for the last 20 demands greater than 0.90;
  - Having a nuclear unit average EDC reliability for the last 50 demands greater than 0.94;
  - c. Having a nuclear unit average EDG reliability for the last 100 demands greater than 0.95;

### B. Procedure Description

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Plant procedures have been reviewed and modified to meet the guidelines in NUMARC 87-00, Section 4 in the following areas:

- Station blackout responses per NUMARC 87-00, Section 4.2.1 (1) through 4.2.1 (11) are covered in Emergency Contingency Actions (ECA) procedure ECA 0.0 (Loss of all AC Power).
- AC power restoration per NUMARC 87-00, Sections 4.2.2 (1), 4.2.2 (2), 4.2.2 (3) and 4.2.2 (5) are covered in
  - a. Station Operating Procedure OS1046.15 (Alternate Power to 345KV Switchyard SF<sub>6</sub> Compressors and Heaters),
  - b. ECA 0.0 (Loss of all AC Power).
- Severe weather actions per NUMARC 87-00, Sections 4.2.3 (1) through 4.2.3 (4) are covered in Station Operating Procedure OS1200.03 (Severe Weather Conditions).

### C. Coping Assessment

The ability of Seabrook Station Unit 1 to cope with a station blackout for four hours in accordance with NUMARC 87-00, Section 3.2.5 was assessed using NUMARC 87-00, Section 7 with the following results:

1. Condensate Inventory For Decay Heat Removal (Section 7.2.1)

It has been determined from Section 7.2.1 of NUMARC 87-00 that 107,745 gallons of water are required for decay heat removal for four hours. The minimum permissible condensate storage tank level per Technical Specifications provides 212,000 gallons of water, which exceeds the required quantity for coping with a four hour station blackout.

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### 2. Class 1E Batteries Capacity (Section 7.2.2)

A battery capacity calculation verifies that the Class 1E batteries have sufficient capacity to meet station blackout loads for four hours assuming loads not needed to cope with a station blackout are removed from DC busses. These loads are identified in plant procedure ECA 0.0 (Loss of all AC Power).

## 3. Compressed Air (Section 7.2.3)

Air-operated valves relied upon to cope with a station blackout for four hours can either be operated manually or have sufficient backup air and electrical sources independent of the preferred and blacked out unit's Class 1E power supply. Valves requiring manual operation or that need backup sources for operation are identified in plant procedure ECA 0.0 (Loss of all AC Power).

### 4. Effects of Loss of Ventilation (Section 7.2.4)

a. Emergency Feedwater (EFW) Pump Room

The calculated steady state ambient air temperature for the steamdriven EFW pump room (the dominant area of concern for a PWR) during a station blackout induced loss of ventilation is 128<sup>O</sup>F.

b. Control Room Complex

The assumption in NUMARC 87-00, Section 2.7.1 that the control room will not exceed 120°F during a station blackout has been assessed. It has been determined that the control room at Seabrook Station does not exceed 120°F during a station blackout. Therefore, the control room is not a dominant area of concern.

Reasonable assurance of the operability of station blackout response equipment in the Emergency Feedwater (EFW) Pump Room has been assessed using Appendix F to NUMARC 87-00 and/or the Appendix F Topical Report. No modifications or associated procedures are required to provide reasonable assurance of equipment operability.

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## 5. Containment Isolation (Section 7.2.5)

The list of containment isolation values has been reviewed to verify that values which must be capable of being closed or that must be operated (cycled) under station blackout conditions can be positioned (with appropriate position indication) independent of the preferred and blacked-out unit's Class IE power supplies. No plant modifications and/or associated procedure changes were determined to be required to ensure that appropriate containment integrity can be provided under SBO conditions.

# 6. Reactor Coolant Inventory (Section 2.5)

The ability to maintain adequate Reactor Coolant System inventory to ensure that the core is adequately cooled for four hours has been assessed. The generic analyses listed in Section 2.5.2 of NUMARC 87-00 were used for this assessment and are applicable to the specific design of Seabrook Station Unit 1. The expected rates of reactor coolant inventory loss under SBO conditions do not result in core uncovery in a SBO of four hours. Therefore, makeup systems under SBO conditions are not required to maintain core cooling under natural circulation (including reflux boiling).

In summary, Seabrook Station has been evaluated against the requirements of 10 CFR 50.63. No modifications to existing equipment were required for compliance with 10 CFR 50.63, and procedure modifications identified in Part B have been completed.

If you have any questions regarding the above please contact Mr. John Tefft at (603) 474-9521, extension 4039.

Very truly yours,

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George S. Thomas

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#### STATE OF NEW HAMPSHIRE

Rockingham, ss.

April 17, 1989

Then personally appeared before me, the above-named George S. Thomas who, being duly sworn, did state that he is Vice President - Nuclear Production of Public Service Company of New Hampshire, that he is duly authorized to execute and file the foregoing information in the name and on the behalf of Public Service Company of New Hampshire, and that the statements therein are true to the best of his knowledge and belief.

Burely & Silloway, Beverly E. Silloway, Notary Bublic

My Commission Expires: March 5, 1990