

May 19, 1995

Mr. Ted C. Feigenbaum  
Senior Vice President  
and Chief Nuclear Officer  
North Atlantic Energy Service Corporation  
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SUBJECT: AMENDMENT NO. 38 TO FACILITY OPERATING LICENSE NPF-86:  
OVERPRESSURE PROTECTION SYSTEM SETPOINT - LICENSE AMENDMENT  
REQUEST 93-11 (TAC M87706)

Dear Mr. Feigenbaum:

The Commission has issued the enclosed Amendment No. 38 to Facility Operating License No. NPF-86 for the Seabrook Station, Unit No. 1, in response to your application dated October 4, 1993.

The amendment revises the Appendix A Technical Specifications (TS) relating to A.C. power sources during operation in Modes 1 through 4. Specifically, the amendment deletes the diesel engine speed specification from Surveillance Requirement (SR) 4.8.1.1.2a.5 and replaces the diesel engine speed requirement with an electrical frequency requirement in SR 4.8.1.1.2g.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by

Albert W. De Agazio, Sr. Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-443  
Serial No. SEA-95-010

Enclosures: 1. Amendment No. 38 to NPF-86  
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 19, 1995

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Senior Vice President  
and Chief Nuclear Officer  
North Atlantic Energy Service Corporation  
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Sincerely,

A handwritten signature in cursive script, reading "Albert W. De Agazio, Sr.".

Albert W. De Agazio, Sr. Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-443  
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cc w/encls: See next page

Mr. Ted C. Feigenbaum  
North Atlantic Energy Service Corporation

Seabrook Station, Unit No. 1

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

NORTH ATLANTIC ENERGY SERVICE CORPORATION, ET AL\*

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 38  
License No. NPF-86

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by North Atlantic Energy Service Corporation, et al. (the licensee), dated October 4, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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\*North Atlantic Energy Service Company (NAESCO) is authorized to act as agent for the: North Atlantic Energy Corporation, Canal Electric Company, The Connecticut Light and Power Company, Great Bay Power Corporation, Hudson Light and Power Department, Massachusetts Municipal Wholesale Electric Company, Montaup Electric Company, New England Power Company, New Hampshire Electric Cooperative, Inc., Taunton Municipal Light Plant, and The United Illuminating Company, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-86 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 38, and the Environmental Protection Plan contained in Appendix B are incorporated into Facility License No. NPF-86. NAESCO shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Phillip F. McKee, Director  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: May 19, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 38

FACILITY OPERATING LICENSE NO. NPF-86

DOCKET NO. 50-443

Replace the following pages of Appendix A, Technical Specifications, with the attached pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. Overleaf pages have been provided.\*

Remove

3/4 8-3

3/4 8-4\*

3/4 8-7\*

3/4 8-8

Insert

3/4 8-3

3/4 8-4\*

3/4 8-7\*

3/4 8-8

## ELECTRICAL POWER SYSTEMS

### A.C. SOURCES

#### OPERATING

### SURVEILLANCE REQUIREMENTS

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4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Class 1E Distribution System shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:\*

- a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:
  - 1) Verifying the fuel level in the day fuel tank;
  - 2) Verifying the fuel level in the fuel storage tank;
  - 3) Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day tank;
  - 4) Verifying the lubricating oil inventory in storage;
  - 5) Verifying the diesel starts from standby conditions and attains a generator voltage and frequency of  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:
    - a) Manual, or
    - b) Simulated loss-of-offsite power by itself, or

\*All planned starts for the purpose of these surveillances may be preceded by an engine prelube period.

## ELECTRICAL POWER SYSTEMS

### A.C. SOURCES

#### OPERATING

### SURVEILLANCE REQUIREMENTS

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#### 4.8.1.1.2 (Continued)

- c) Simulated loss-of-offsite power in conjunction with an SI Actuation test signal, or
  - d) An SI Actuation test signal by itself.
- 6) Verifying the generator is synchronized, loaded to greater than or equal to 5600 kW and less than or equal to 6100 kW\*\*, and operates with a load greater than or equal to 5600 kW and less than or equal to 6100 kW for at least 60 minutes; and
- 7) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day fuel tank;
- c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
- d. By sampling new fuel oil in accordance with ASTM-D4057-81 prior to addition to storage tanks and:
- 1) By verifying in accordance with the tests specified in ASTM-D975-81 prior to addition to the storage tanks that the sample has:
    - a) An API Gravity of within 0.3 degree at 60°F, or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60/60°F of greater than or equal to 0.81 but less than or equal to 0.89, or an API gravity of greater than or equal to 28 degrees but less than or equal to 42 degrees;

\*\*Diesel generator loading may be in accordance with manufacturers recommendation, including a warmup period. The load range is provided to preclude routine overloading of the diesel generator. Momentary transients outside the load range, due to changing bus conditions, do not invalidate the test.

# ELECTRICAL POWER SYSTEMS

## A.C. SOURCES

### OPERATING

#### SURVEILLANCE REQUIREMENTS

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##### 4.8.1.1.2 (Continued)

- 7) Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to 6363 kW and less than or equal to 6700 kW.\*\* During the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to 5600 kW and less than or equal to 6100 kW. The generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, verify that the diesel generator starts on a manual or auto start signal, attains generator voltage and frequency of  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds, and operates for longer than 5 minutes.\*\*\*
- 8) Verifying that the auto-connected loads to each diesel generator do not exceed the short time rating of 6697 kW;
- 9) Verifying the diesel generator's capability to:
  - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
  - b) Transfer its loads to the offsite power source, and
  - c) Be restored to its standby status.

\*\*Diesel generator loading may be in accordance with manufacturers recommendations, including a warmup period. The load range is provided to preclude routine overloading of the diesel generator. Momentary transients outside the load range, due to changing bus conditions, do not invalidate the test.

\*\*\*If the diesel generator fails to start during this test, then it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at greater than or equal to 5600 kW and less than or equal to 6100 kW for 2 hours or until operating temperature has stabilized. The load range is provided to preclude routine overloading of the diesel generator. Momentary transients outside the load range, due to changing bus conditions, do not invalidate the test.

# ELECTRICAL POWER SYS. S

## A.C. SOURCES

### OPERATING

#### SURVEILLANCE REQUIREMENTS

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##### 4.8.1.1.2 (Continued)

- 10) Verifying that with the diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation, and (2) automatically energizing the emergency loads with offsite power;
  - 11) Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines;
  - 12) Verifying that the emergency power sequence timer is OPERABLE with the interval between each load block within  $\pm 10\%$  of its design interval;
  - 13) Verifying that the following diesel generator lockout features prevent diesel generator starting:
    - a) Barring device engaged, or
    - b) Differential lockout relay.
  - 14) Simulating a Tower Actuation (TA) signal while the diesel generator is loaded with the permanently connected loads and auto-connected emergency (accident) loads, and verifying that the service water pump automatically trips, and that the cooling tower pump and fan(s) automatically start. After energization the steady state voltage and frequency of the emergency buses shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz; and
  - 15) While diesel generator 1A is loaded with the permanently connected loads and auto-connected emergency (accident) loads, manually connect the 1500 hp startup feedwater pump to 4160-volt bus E5. After energization the steady-state voltage and frequency of the emergency bus shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz.
- g. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to  $60 \pm 1.2$  Hz in less than or equal to 10 seconds; and



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 38 TO FACILITY OPERATING LICENSE NO. NPF-86  
NORTH ATLANTIC ENERGY SERVICE CORPORATION  
SEABROOK STATION, UNIT NO. 1  
DOCKET NO. 50-443

1.0 INTRODUCTION

By application dated October 4, 1993, North Atlantic Energy Service Corporation (North Atlantic/the licensee) proposed an amendment to the Appendix A Technical Specifications (TS) for the Seabrook Station, Unit 1 (Seabrook). The proposed changes would delete the diesel engine speed specification from Surveillance Requirement (SR) 4.8.1.1.2a.5 and would replace the diesel engine speed requirement with an electrical frequency requirement in SR 4.8.1.1.2g.

2.0 EVALUATION

SR 4.8.1.1.2.a.5 requires that each diesel-generator be started at a specified frequency to verify engine starting and acceleration to at least 514 rpm within 10 seconds. In addition, the SR requires verification that the generator voltage and frequency is  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal. North Atlantic has proposed to change this SR by deleting the requirement to verify that the diesel engine accelerates to at least 514 rpm. The SR would continue to require that the diesel-generator test be conducted to verify that the generator voltage and frequency is  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz respectively within 10 seconds after the start signal.

SR 4.8.1.1.2g requires that the diesel-generators be started simultaneously during shutdown at least once per 10 years or after any modifications which could affect diesel-generator interdependence to verify that the diesel-generators accelerate to at least 514 rpm in less than or equal to 10 seconds. North Atlantic has proposed to replace the diesel-generator speed requirement with a requirement that the generator frequency is  $60 \pm 1.2$  Hz in less than or equal to 10 seconds.

The emergency generators at Seabrook are three-phase, 4160 volt synchronous machines with a stationary armature and rotating 14 pole field. The generators are driven by direct-coupled diesel engines. The prime movers and the generators are direct-coupled and must rotate at the same speed;

therefore, engine speed and generator electrical frequency are directly related and are described by the equation:

$$n=120x\frac{f}{p}$$

where: n = engine speed, rpm  
f = generator frequency, Hz  
p = number of generator poles

Therefore, since the number of poles in the emergency generators is fixed, it is unnecessary to require the verification of both engine speed and electrical frequency. For this surveillance, the parameters of significance with regard to the ability of the diesel-generators to perform their safety function are frequency, voltage, and time following the start signal. With the appropriate specification of these parameters, there would be assurance that the diesel-generators would be able to accept in the proper sequence and continue to carry safety-related electrical loads starting 10 seconds after start signal. Since the generator is direct-coupled to the engine and the engine and generator must rotate at the same speed, the speed specification is redundant. This has been recognized in the Improved Standard Technical Specifications (NUREG-1431) where comparable engine speed requirements do not appear. For these reasons, the staff accepts North Atlantic's proposed change to SR 4.8.1.1.2a.5.

The current SR 4.8.1.1.2g requires verification that both diesel-generators can attain a speed of at least 514 rpm within 10 seconds. As discussed above, the parameters of interest with regard to the ability of the diesel-generators to perform their safety function are electrical frequency, voltage, and time following the start signal. Therefore, North Atlantic's proposed substitution of a generator frequency of  $60 \pm 1.2$  Hz in place of a minimum speed of 514 rpm in SR 4.8.1.1.2g is acceptable to the staff.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Hampshire and Massachusetts State officials were notified of the proposed issuance of the amendment. The State officials had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (59 FR

4941). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (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.

Principal Contributor: A. De Agazio

Date: May 19, 1995