September 13, 2002

Mr. Ted C. Feigenbaum
Executive Vice President and Chief Nuclear Officer
Seabrook Station
North Atlantic Energy Service Corporation
c/o Mr. James M. Peschel
P.O. Box 300
Seabrook, NH 03874

SUBJECT: SEABROOK GENERATING STATION - NRC SPECIAL INSPECTION REPORT NO. 50-443/02-010

Dear Mr. Feigenbaum:

On August 2, 2002, the NRC completed a Special Inspection Team at the North Atlantic Energy Service Corporation's (NAESCo's) Seabrook Generating Station to evaluate the July 24, 2002, failure of emergency diesel generator "B". The results of the NRC team's inspection were discussed on August 2, 2002, with Messrs J. Vargas, J. Peschel, G. St. Pierre, and other members of your staff. The enclosed report (Enclosure 1) presents the results of that inspection.

The NRC team examined activities related to reactor safety and compliance with the Commission's rules and regulations, and with the conditions of your operating license. The inspection consisted of selected examination of procedures, representative records and equipment, interviews with personnel, and observations of activities per the NRC team's charter (Enclosure 2).

This report discusses a finding that has been evaluated under the risk significance determination process (SDP) as having very low safety significance (Green). This finding was determined to be a violation of NRC requirements. However, because of its very low safety significance and because it has been entered into your corrective action program, the NRC is treating this finding as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the non-cited violation, you should provide a response with the basis of your denial, within 30 days of the date of this inspection report to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Region I, the Director of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001, and the NRC Resident Inspector at the Seabrook Generating Station.

In addition, this report discusses the NRC team's assessment of the event causal factors, root cause evaluation, corrective actions and associated risk significance. In this area, the team found that your staff's immediate actions to identify the probable cause of the "B" diesel generator failure and to restore the diesel to operable condition were acceptable. However, the team was not able to determine, at this time, if the root causes of the failure of the rectifier bank

are associated with performance issues. Pending review of the root cause determination of the failure of the rectifier bank, this item is considered unresolved.

In terms of conditional core damage probability, the risk associated with the failure of the "B" diesel generator during the surveillance test on July 24, 2002, and subsequently being degraded for approximately 57 hours, was determined to be of low safety significance (estimated conditional core damage probability or 1.3E-6). The mitigating function of the EDG system was not lost since the "A" EDG remained operable.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Wayne D. Lanning, Director
Division of Reactor Safety

Docket No: 50-443
License No: NPF-86

Enclosures:
1) NRC Inspection Report No. 50-443/02-010
2) NRC Special Inspection Team Charter

cc w/encl:
B. D. Kenyon, President and Chief Executive Officer
J. M. Peschel, Manager - Regulatory Programs
G. F. St. Pierre, Station Director - Seabrook Station
D. G. Roy, Nuclear Training Manager - Seabrook Station
W. J. Quinlan, Esquire, Assistant General Counsel
D. Bliss, Director, New Hampshire Office of Emergency Management
D. McElhinney, RAC Chairman, FEMA RI, Boston, Mass
R. Backus, Esquire, Backus, Meyer and Solomon, New Hampshire
D. Brown-Couture, Director, Nuclear Safety, Massachusetts Emergency Management Agency
F. W. Getman, Jr., President and Chief Executive Office, BayCorp Holdings, LTD
R. Hallisey, Director, Dept. of Public Health, Commonwealth of Massachusetts
M. Metcalf, Seacoast Anti-Pollution League
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
S. Comley, Executive Director, We the People of the United States
W. Meinert, Nuclear Engineer, Massachusetts Municipal Wholesale Electric company
S. Allen, Polestar Applied Technology, Incorporated
R. Shadis, New England Coalition Staff

Distribution w/encl: **(VIA E-MAIL)**
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OFFICE	RI/DRS		RI/DRS		RI/DRP		RI/DRS	N	RI/DRS			
NAME	JYerokun		JLinville		BMcDermott		JTrapp		WLanning			
DATE	08/21/02		09/11/02		09/10/02		09/11/02		09/11/02			

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-443
License No:	NPF-86
Report No:	50-443/02-010
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Generating Station
Dates:	July 30 - August 2, 2002
Inspectors:	J. Yerokun, Senior Reactor Engineer, DRS, Team Leader L. Cheung, Senior Reactor Engineer, DRS J. Trapp, Senior Reactor Analyst, DRS (in-office)
Approved by:	James C. Linville, Chief Electrical Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000443/02-010; on 07/30/02-08/02/02; on July 30 - August 2, 2002; Seabrook Generating Station; Other Activities. Special Inspection of the July 24, 2002, failure of emergency diesel generator, 1B. A violation was identified in the area of compliance with Technical Specification 3.8.1.1 requirements for testing an emergency diesel generator.

The inspection was conducted by two regional inspectors with support from a regional senior reactor analyst. One green finding of very low significance was identified during this inspection and was classified as a non-cited violation. The significance of issues is indicated by their color (green, white, yellow, red) using IMC 0609 " Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/reactors/operating/oversight.html.

Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. A violation of Technical Specification 3.8.1.1 associated with the failure to test the emergency diesel generator (EDG) "A" within 24 hours of EDG "B" being declared inoperable. The issue was entered in the corrective action system as CR 02-11795. This violation is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 50-443/02-10-01)**

  The finding is more than minor since failure of the emergency diesel generator could affect the mitigating system cornerstone. The risk of this finding is determined to be of very low safety significance because the mitigating function of the EDG system was not lost since EDG "A" remained operable during the period of time that EDG "B" was unavailable. (Section 4OA3.1)

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Report Details

Summary of Plant Status

On July 24, 2002, Seabrook Station was operating at 100% power. Operators conducted a scheduled monthly surveillance test of the "B" emergency diesel generator (EDG). Due to problems encountered during the testing, EDG "B" was declared inoperable and not returned to operable status until July 27, 2002. Seabrook Station remained at 100% during the evolution.

Background

On July 24, 2002, the licensee conducted the monthly surveillance test of EDG "B", using station procedure OX1426.05, "DG 1B Monthly Operability Surveillance." About three hours after EDG "B" was fully loaded with 5900 kW, the reactive load began to oscillate with a magnitude of 1200 to 1500 kVAR (peak-to-peak). The field voltage oscillated between 200 and 300 Vdc. Plant operators reduced the load and the oscillation stopped when EDG "B" load was below 4000 kW. When the load was increased again, the oscillation returned. Subsequently the licensee shut the diesel down and at 11:02 P.M., on July 24, 2002, declared EDG "B" inoperable and entered limiting condition for operation (LCO) per Technical Specification Section 3.8.1.1b. This event was documented in Condition Report (CR) 02-11586.

Following troubleshooting and repair activities, EDG "B" was successfully tested, with rectifier bank 2 in service, and on July 27, 2002, EDG "B" was declared operable. The initial surveillance test and subsequent troubleshooting activities since July 24, 2002, had been conducted with rectifier bank 1 in service. On July 30, 2002, the NRC Special Inspection Team (SIT) was dispatched to the site to inspect and assess the plant's personnel and equipment response to the event. The Special Inspection Team was initiated in accordance with NRC Management Directive 8.3, NRC Incident Investigation Program. The inspection was conducted using NRC inspection procedure 93812, Special Inspection.

EDG Static Exciter Rectifiers

Each EDG has two vertically mounted rectifier banks in the local panel. Each rectifier bank is about two feet wide and three feet long and contains the following: three silicone controlled rectifiers (SCR), three small transformers for SCR gate firing, six resistors, seven diodes, two voltage suppressors, and three 400-amp fuses. The rectifier bank is part of the static exciter/voltage regulator (SEVR) which also includes the two motor operated controllers (MOC). Either bank is sufficient for the EDG to function and be operable. A local rotary switch (SW1) is used for selecting one of the two banks for service. The plant's practice (prescribed in the monthly surveillance procedure) has been to alternate the rectifier banks monthly prior to the surveillance test. The rectifier bank provides direct current (dc) power to the generator field (for field flashing and the regulation of the diesel generator output voltage) after power is generated by the diesel generator. Initial field flashing is powered by the station batteries. Normally, the rectifier bank supplies about 90 amps to the generator field at 90 Vdc for a no-load condition, and 175 amps at 240 Vdc for a full-load condition.

4. OTHER ACTIVITIES [OA]

4OA3 Event Follow-up

.1 Failure of Emergency Diesel Generator "B"

a. Inspection Scope

This inspection was conducted in accordance with NRC IP 93812, Special Inspection, to assess the plant's response to the failure of the "B" EDG that occurred on July 24, 2002. The team assessed the licensee's immediate actions and evaluation of the EDG failure during the surveillance test. The team also evaluated the risk significance of the failure of the "B" EDG and assessed the adequacy of the licensee's risk evaluation.

The team reviewed applicable documents generated to address the EDG failure and subsequent troubleshooting and corrective actions. The team also reviewed the test results documented in Work Order (WO) 02-08011 and CR 02-11586 which described the test anomalies. The inspectors also reviewed the data (traces) recorded during the test, reflecting the generator output power and reactive load, and the field currents and voltages.

The team interviewed plant personnel associated with the testing, troubleshooting and repair activities and also interviewed plant management knowledgeable of the decision making processes that transpired during the event. The team assessed the adequacy of the licensee's investigation and immediate corrective actions.

The team reviewed applicable sections of the updated final safety analysis report (UFSAR), Technical Specifications, engineering evaluations, and held discussions with electrical system engineers to determine the technical and regulatory aspects of the EDG failure.

The team reviewed some aspects of the maintenance history of the EDGs to determine if there were previous failures similar to the July 24, 2002, EDG "B" failure. The review included: the list of work order report for all EDG work since July 24, 2002, the work order overview report for the EDG work history in 2002, and the work history on the EDG local panels, 1-DG-CP-76A and 1-DG-CP-76B, relative to control panel inspection/maintenance. In addition, the team reviewed condition reports associated with both EDGs. The documents that were reviewed are listed under Supplemental Information in this report.

The team also assessed the testing of EDG "A" on July 30, 2002 to ascertain the operability of the diesel generator. The inspectors reviewed surveillance procedure, "OX1426.01, DG 1A Monthly Operability Surveillance," and witnessed portions of the test including observation of the thermography during the test.

b. Findings

Green. A non-cited violation of Technical Specification (TS) 3.8.1.1 for failure to demonstrate operability of EDG "A" by testing within 24 hours of when EDG "B" was declared inoperable.

During the period when EDG "B" was inoperable (July 24 - 26, 2002), the licensee did not test EDG "A" as required by TS 3.8.1.1, Action Statement b. The licensee stated that the test was not performed because activities were ongoing to determine the cause of the failure of EDG "B," and preliminary indication was that the nature of the failure was not a common mode failure. However, the team determined that since the licensee had not been able to eliminate potential common mode failure within 24 hours of EDG "B" failure, then EDG "A" should have tested. The licensee later tested EDG "A" successfully on July 30, 2002.

TS 3.8.1.1 b requires that two separate and independent diesel generators be operable at Modes 1, 2, 3 and 4. Action statement b of the TS requires, in part, that with a diesel generator inoperable, the operability of the remaining diesel generator be demonstrated by performing specification 8.8.1.1.2a.5 (testing) within 24 hours. However, the action statement allows that the operability of the remaining diesel generator need not be verified if it is currently operating, or if the inoperable diesel generator became inoperable due to, amongst other reasons, an independently testable component with no potential common mode failure of the diesel generator.

Although subsequent testing of EDG "A" on July 30 was satisfactorily completed, the failure to test EDG "A" within 24 hours of the failure of EDG "B" on July 24, 2002, constituted a violation of Technical Specification 3.8.1.1. The finding was determined to be of very low safety significance because the failure to test EDG "A" was minor since the operability of EDG "A" was not affected. The issue was screened to be Green in SDP Phase I because mitigating system equipment remained operable and there was no loss of safety function. This low risk violation was entered into the licensee's corrective action program as CR 02-11795, "Evaluate Station's Interpretation of T.S. 3.8.1.1 Action Statement," and will be treated as a non-cited violation **(NCV 50-443/02-10-001)** consistent with the NRC's Enforcement Policy.

Emergency Diesel Generator "B" Troubleshooting and Repair Activities

During the licensee's initial troubleshooting activities, which began on July 25, 2002, the licensee suspected that the manual motor operated controller (MOC-2) might have been the cause of the oscillation because the rheostat in MOC-2 functioned erratically. MOC-2 was replaced. On July 26, the licensee tested EDG "B." About one hour after the EDG was fully loaded, a reactive load oscillation with an amplitude of +/- 250 kVAR, and a spike of up to 8000 kVAR occurred. The licensee initiated an emergency shutdown of the diesel.

During the test, the licensee performed thermography of the local control panel circuitry when the diesel was fully loaded and identified two unusual hot spots, one on a termination (crimp lug barrel) of cable F1A near Diode CR4, the other on a termination of cable P2A near the rectifier bank selector switch SW1. The licensee replaced cable F1A on July 26, 2002. The licensee postponed the replacement of cable P2A until the time when SW1 (with cracked phenolic) was to be replaced.

Following additional maintenance activities, the license elected to place rectifier bank 2 in service and test EDG "B." However, during the test, the output breaker could not be closed because of a failed synch check relay (relay 25Y). The failed relay was subsequently replaced, and on July 27, 2002, EDG "B" completed a 4-hour test and the diesel generator was declared functional. No reactive load oscillation occurred at the time. The licensee then completed another test (a 1-hour surveillance test) at full load and declared EDG "B" operable at 7:35 A.M., on July 27, 2002.

As a means of ensuring that rectifier bank 1 will not be placed in service until repaired, standing operating order (SOO) 02-015, "DG 1B Rectifier Selector Switch Placement" was issued on July 29, 2002, to maintain the selector switch in position 2 or the B EDG will be declared inoperable. In addition, a caution order was placed on the local EDG control panel.

On July 26, 2002, when the licensee switched from the potentially degraded rectifier bank 1 to bank 2, and later demonstrated that EDG "B" was operable, there was no written operability evaluation to demonstrate that the operability of EDG "B" was unaffected by potentially degraded bank 1. The team reviewed the static exciter/voltage regulator wiring diagrams, observed a spare rectifier and verified that the two rectifier banks were totally independent and electrically isolated. The inspectors also reviewed a licensee evaluation (Evaluation of Requirements for Redundant DG Excitation Rectifier Banks, undated) and Seabrook licensing documents and verified that there were no regulatory requirements to have redundant rectifier banks for the EDGs.

Emergency Diesel Generator "A" Testing

On July 30, 2002, the team observed the testing of EDG "A." During the test, when the diesel generator electrical load was increased to about 3400 kW, an oscillation of the reactive load of about 200 kVAR (+/-100) was observed. The load was reduced to about 3200 kW and the VAR load was stabilized. The licensee evaluated the results and determined that an oscillation of 600 kVAR or less would not affect the operability of the diesel generator. The load was subsequently increased to about 5900 kW without further anomalies. The licensee concluded that EDG "A" was operable. The licensee also completed thermography of EDG "A" local control panel during the test and did not identify any unusual hot spots.

.2 Event Causal Factors, Root Causes and Corrective Actions

a. Inspection Scope

The team reviewed the licensee's activities to determine the root cause of the EDG "B" failure. The team also independently assessed the causal factors for the event and the appropriateness of the licensee's initial corrective actions.

b. Findings

Following the July 24, 2002, test failure, the licensee's initial troubleshooting indicated that the kVAR oscillation was caused by the malfunction of the static exciter/voltage regulator (SEVR). The licensee's root cause team initially determined that the rectifier/switch assembly was the most probable cause. The team agreed with the licensee's determination. However, pending the results of the laboratory tests of the failed rectifier bank, the root cause of the failure, whether it is associated with performance issues, is indeterminate. Therefore, the NRC's assessment of performance and associated finding, if any, in this area is left unresolved pending completion of the NRC's review of the licensee's root cause evaluation and results of the laboratory test of the failed rectifier. **(URI 50-443/02-10-02)**

The team concluded that the most probable cause of the anomaly was a failure of rectifier bank 1. However, the exact nature of the failure in the bank was indeterminate. The licensee was pursuing further testing of the rectifier bank to determine the cause of it's failure.

.3 Risk Significance of Event

a. Inspection Scope

The team evaluated the risk significance of the failure of the "B" emergency diesel generator based on conditional core damage probability (CCDP). The team also reviewed the adequacy of the licensee's risk evaluation.

b. Findings

The conditional core damage probability (CCDP) as a result of the "B" EDG being degraded for approximately 57 hours in July 24 - 26, 2002, is approximately 1.3E-6. This is based on the NRC's Seabrook PRA SPAR model (internal events only) with a base core damage frequency (CDF) of 2.83E-5 (internal events only). The sequences of importance are a failure of offsite power, followed by the failure of the remaining diesel generator and the failure to recover offsite power prior to core damage occurring as a result of a reactor coolant pump seal loss of coolant accident. The other important sequence contributing to the risk of this condition is a loss of offsite power followed by the failure of the "A" EDG, failure of the TDAFWP and the failure to quickly recover offsite power. This result is consistent with the licensee's internal events PRA estimated CCDP of approximately 1.07E-6.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On August 2, 2002, the NRC team presented the inspection results to Messrs. J. Vargas, G. St. Pierre, and other members of the North Atlantic Energy Service Corporation. No document reviewed during the inspection was considered proprietary.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

NAESCO (Licensee)

J. Adams, Materials Manager
E. Alexander, Safety Health Supervisor
M. Debay, Assistant Operations Manager
N. Durand, Information Services Manager
R. Hickok, NRC Coordinator
R. Jamison, Design Engineering
M. Kiley, Assistant Maintenance Manager
M. Lewis, Modifications and Projects Manager
E. Metcalf, Plant Engineering Assistant Manager
T. Nichols, Plant Engineering Manager
D. Nowick, NSEG Supervisor
J. Peschel, Manager, Regulatory Programs
G. St. Pierre, Station Director
B. Plummer, Operations manager
J. Randolf, Security Manager
L. Rau, Reliability & Safety Engineering Supervisor
B. Roach, Self Assessment Program Manager
D. Robinson, Chemistry Tech Supervisor
J. Sobotka, Oversight Manager
M. Toole, Maintenance Raining Superintendent
J. Vargas, Engineering Director
D. White, NSARC

NRC Personnel

J. Linville, Acting Deputy Director, DRS
A. Cerne, Acting Senior Resident Inspector, Seabrook
K. Jenison, Senior Project Engineer

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

NCV	50-443/02-10-01	Failure to test EDG “A” within 24 hours of failure of EDG “B” as required by Tech. Spec. 3.8.1.1, action b (Section 4OA3.1) .

Open

URI	50-443/02-10-02	Review of the licensee’s root cause evaluation and results of the rectifier bank failure determination (Section 4OA3.2)

LIST OF ACRONYMS

Amp	Amperes (unit of electrical current)
CCDP	Conditional Core Damage Probability
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CR	Condition Report
DBD	Design Basis Document
EDG	Emergency Diesel Generator
kV	Kilovolt (1,000 Volts)
kVAR	Kilovars (1,000 VARS)
kW	Kilowatts (1,00 Watts)
LCO	Limiting Condition for Operation
MOC	Motor Operated Controller
NAESCO	North Atlantic Energy Service Corporation
NCV	Non cited violation
NH	New Hampshire
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
SCR	Silicone Controlled Rectifier
SDP	Significance Determination Process
SERV	Static Exciter/Voltage Regulator
SIT	Special Inspection Team
SOO	Standing Operating Order
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VAR	Volt-Ampere-Reactive
Vdc	Volts, Direct Current
WO	Work Order

DOCUMENTS REVIEWED

Procedures

OX 1426.01, DG 1A Monthly Operability Surveillance, Rev. 08

Engineering Documents

Design Basis Document, DBD-DG-01, Emergency Diesel Generators - Mechanical, Revision 2
Detailed Systems Text, Emergency Diesel Electrical System, Revision 5
Evaluation of Requirement for Redundant DG Excitation Rectifier banks, undated.
Updated Final Safety Analysis Report
90-72300 99X, Basler Electric Instruction Manual for Motor Operated Potentiometer
9-1121-00-990, Basler Electric Instruction Manual for Static Exciter Regulator Model SER-CB

Electrical Drawings

1-NHY-310010, Diesel Generator DG-1A and DG-1B One Line Diagram
9-1121-00960, Basler Electric, Interconnection Diagram, Revision F.
9-1121-01-910, Basler Electric, Nuclear Exciter/Regulator, Schematic Power Chassis, Rev. C.
9-1121-02-910, Basler Electric, Nuclear Exciter/Regulator, Schematic Control Chassis, Rev. E.
9-1121-03-910, Basler Electric Rectifier Chassis “A” Schematic, Revision A.
9-1121-03-920, Basler Electric Outline Drawing Rectifier Chassis “A”, Revision C.
9-1121-04-910, Basler Electric Rectifier Chassis “B” Schematic, Revision A.
9-1121-04-920, Basler Electric Outline Drawing Rectifier Chassis “B”, Revision C.
01761044, Electrical Schematic EDG Control: Sh 1, Rev 23; Sh 6, Rev 32; Sh 7, Rev. 21
01761387, Diesel Generator Control Panel, Sheet 2, Revision 13.

Condition Reports

CR 02-11795, Station’s Interpretation of TS 3.8.1.1 Action Statement b.
CR 02-11896 CR 02-01106 CR 02-05519 CR 02-05315 CR 02-11649 CR 02-06326
CR 02-13236 CR 01-11123 CR 02-08433 CR 02-11586 CR 01-10979 CR 02-01106

Work Orders

WO 0208011, EDG B Operability Surveillance
WO 0223644, Investigate/Repair EDG 1B Voltage Regulator and kVAR Loading Cycling
WO 0224544, D/G 1A Monthly Operability Surveillance
WO 0223739 WO 0222334 WO 0211910 WO 0223644 WO 0224591 WO 0224592
WO 0223718 WO 0223733 WO 0211910 WO 0224541 WO 0224542 WO 0224544
WO 0222334 WO 0223739

CHRONOLOGY OF EVENTS

Wednesday July 24, 2002

4:04 P.M. Emergency diesel generator (EDG) "B" started for monthly surveillance test (EDG rectifier bank 1 in service)

4:13 P.M. EDG "B" output breaker closed

4:43 P.M. EDG "B" at full load (approximately 5,900 KW)

7:45 P.M. Oscillation of EDG "B" VAR loading observed (3,200 to 4,100 kVAR)

9:00 P.M. Operators began unloading EDG "B." VAR load noted to be steady at below 4,500 KW but oscillation was repeatable at above 4,500 KW.

9:51 P.M. EDG "B" unloaded, output breaker opened, and normal shutdown completed

11:02 P.M. Plant entered Technical Specification LCO 3.8.1.1 for EDG "B" inoperable (Actions Statements b and d applicable)

11:17 P.M. Operators completed AC power source weekly operability verification (TS 3.8.1.1, Action b.)

Required systems and subsystems dependent on "A" EDG verified operable (TS 3.8.1.1, Action d.1)

Steam driven emergency feedwater pump verified operable (TS 3.8.1.1, Action d.2)

Thursday July 25, 2002

5:45 A.M. AC power source weekly operability verification completed

12:56 P.M. AC power source weekly operability verification completed

7:57 P.M. AC power source weekly operability verification completed

Friday July 26, 2002

2:57 A.M. AC power source weekly operability verification completed

4:00 A.M. Management meeting held

6:02 A.M. EDG "B" started for troubleshooting activities (EDG rectifier bank 1 in service)

7:15 A.M. EDG "B" at Full Load (Approximately 5,900 kW)

Oscillation of EDG VAR load observed

Thermography shows two hot spots in EDG “B” panel

8:45 A. M. EDG B Shutdown due to VAR Loading oscillation

10:06 A.M. AC power source weekly operability verification completed

5:00 P.M. AC power source weekly operability verification completed

7:50 P.M. Management review completed for post-maintenance restart of EDG “B”

8:59 P.M. EDG “B” Started
(Rectifier bank 2 in service)

9:50 P.M. EDG “B” output breaker could not be closed from the main control board
(later determined to be due to Synch Check Relay, DG 25Y, failure)

11:39 P.M. EDG “B” Breaker Closed
(Following replacement of Sync Check Relay)

Saturday July 27, 2002

12:01 A.M. AC power source weekly operability verification completed

12:10 A.M. EDG “B” at Full load (Approximately 5,900 KW

4:24 A.M. EDG “B” unloaded, breaker opened

4:35 A.M. EDG “B” Shutdown and declared functional

5:41 A.M. EDG “B” Started

6:24 A.M. EDG “B” at Full Load

7:07 A.M. AC power source weekly operability verification completed

7:35 A.M. EDG “B” declared operable

7:55 A.M. EDG “B” shutdown

Operators exited Tech. Spec. 3.8.1.1

July 30, 2002

MEMORANDUM TO: James C. Linville, Team Manager
Special Inspection

Jimi T. Yerokun, Team Leader
Special Inspection

FROM: Wayne D. Lanning, Director **/RA/**
Division of Reactor Safety

SUBJECT: SPECIAL INSPECTION CHARTER - SEABROOK NUCLEAR POWER STATION

A special inspection has been established to inspect and assess the plant's response to a failure of "B" Emergency Diesel Generator (EDG) that occurred at Seabrook Nuclear Power Station on July 24, 2002. The special inspection team will include:

Manager:	James C. Linville, Deputy Director, DRS
Leader:	Jimi T. Yerokun, Senior Reactor Inspector, DRS
Members:	Leonard S. Cheung, Senior Resident Inspector, DRP
	James M. Trapp, Senior Reactor Analyst, DRS
	(In-office support)

The objectives of the special inspection are to assess the licensee's root cause evaluation and corrective actions, independently evaluate the risk significance of the failure of the "B" EDG, and determine possible generic implications.

The special inspection was initiated in accordance with NRC Management Directive 8.3, NRC Incident Investigation Program and coordinated with NRR and NSIR. The inspection will be performed in accordance with the guidance of Inspection Procedure 93812, Special Inspection. The report will be issued within 45 days following the exit for the inspection. If you have questions regarding the objectives of the attached charter, please contact James Linville at (610) 337-5129.

Attachment: Special Inspection Charter

Special Inspection Charter
Seabrook Nuclear Power Station
Failure of the “B” Emergency Diesel Generator

The objectives of the inspection are to determine the facts surrounding the failure of the “B” EDG that occurred at Seabrook Nuclear Power Station on July 24, 2002. Specifically, the team should:

1. Assess the adequacy of the licensee’s immediate actions and evaluation of the “B” emergency diesel generator (EDG) failure during the surveillance test, including compliance with Technical Specifications, adequacy of operability evaluations, and evaluation of potential common cause failures.

2. Assess the adequacy of the licensee’s corrective actions and extent of condition review for degraded conditions identified prior to the failure.

3. Independently evaluate the risk significance of the failure of the “B” EDG and confirm the adequacy of the licensee’s risk evaluation through consultation with regional and headquarters Senior Reactor Analysts.

4. Determine possible generic implications associated with the failure of the “B” EDG.

6. Document the inspection findings and conclusions in an inspection report within 45 days of the exit meeting for the inspection.