November 9, 2001

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 STATION - NRC INSPECTION REPORTS 50-443/01-012 and 50-443/01-013

Dear Mr. Feigenbaum:

On September 28, 2001, the NRC completed two inspections at the Seabrook nuclear power station, NRC inspections 50-443/01-012 and 50-443/01-013. The enclosed reports present the results of these inspections. The results were discussed with you and members of your staff on September 28, 2001.

NRC inspection report 50-443/01-012 documents the annual baseline inspection of your activities related to the identification and resolution of problems, your compliance with the Commission's rules and regulations, and the conditions of your operating license. Within these areas, the inspection involved selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The team concluded that, based on the samples reviewed, the overall implementation of the corrective action program at Seabrook Station was acceptable. They were adequately identifying problems, and the actions taken for the condition reports were generally acceptable to correct the problem and prevent recurrence. However, some examples were identified in which problems were not thoroughly evaluated to determine the cause or appropriately broad to address the extent of condition. Additionally, as identified during NRC Special Inspections 50-443/00-011 and 01-005, the failures to evaluate problems in sufficient detail contributed to the failures of the B emergency diesel generator and turbine-driven emergency feed pump.

Also, on September 28, 2001, the NRC completed a supplemental inspection at the Seabrook nuclear power station per Inspection Procedure 95001. The purpose of the supplemental inspection was to review North Atlantic Energy Service Corporation's evaluation and corrective actions associated with the failure of the B emergency diesel generator on November 1, 2000. The NRC had previously issued a Notice of Violation and an associated finding of low to moderate risk significance (White) by letter, dated June 29, 2001, based on performance issues involving the failure to identify and take appropriate corrective actions for degraded conditions for the B diesel generator.

The NRC determined that your staff's evaluations of the failed diesel generator were adequate to identify the probable causes of the piston liner failure and appropriately broad in scope to identify the extent of the problems with testing and maintaining the diesel generators. The NRC further determined that your completed and planned corrective actions address the causes identified in your evaluations. Based on your overall acceptable performance in addressing the inoperable diesel generator, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Based on the adequacy of your evaluations, corrective actions, and the information contained in your letter dated July 27, 2001, the referenced Notice of Violation has been closed.

Based on the results of the two inspections, one issue of very low safety significance (Green) was identified. This issue was determined to involve a violation of NRC requirements. However, because of the very low safety significance involved and because the issue has been entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation, in accordance with Section VI.A of the Enforcement Policy. If you deny this Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Seabrook facility.

In accordance with 10CFR2.790 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 the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.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 50-443/2001-12, Annual Baseline Inspection for the Identification and Resolution of Problems
2. NRC Inspection Report 50-443/2001-13, Supplemental Inspection due to a Finding of Low to Moderate Safety Significance (White) Regarding the 1B Diesel Generator Failure in November 2000

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
D. E. Carriere, Director, Production Services
W. J. Quinlan, Esquire, Assistant General Counsel
W. Fogg, 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., Vice President/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
S. Allen, Polestar Applied Technology, Incorporated
R. Shadis, New England Coalition Staff

Distribution w/encls: **(VIA EMAIL)**
H. Miller, RA
J. Wiggins, DRA
R. Jenkins, RI EDO Coordinator
E. Adensam, NRR (ridsnrrdlpmlpdi)
G. Wunder, PM, NRR
W. Lanning, DRS
R. Crlenjak, DRS
R. Conte, DRS
J. Caruso, DRS
D. Lew, DRS
C. Cowgill, DRP
R. Summers, DRP
K. Jenison, DRP
T. Haverkamp, DRP
G. Dentel, SRI - Seabrook
J. Brand, RI - Seabrook
Region I Docket Room (with concurrences)

DOCUMENT NAME: G:\OSB\CARUSO\SEABROOKPI&R01-12AND01-13.WPD
After declaring this document "An Official Agency Record" it **will** be released to the Public.
To receive a copy of this document, indicate in the box: "**C**" = Copy without attachment/enclosure "**E**" = Copy with attachment/enclosure "**N**" = No copy

OFFICE	RI/DRS	RI/DRS/SRA	RI/DRP	RI/DRS	RI/DRP	RI/DRS	RI/DRS
NAME	JCaruso	JTrapp	RSummers	JLinville	CCowgill	DLew	WLanning
DATE	11/06/01	11/ 07/01	11/07/01	11/07/01	11/08/01	11/09/01	11/09/01

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-443
License No:	NPF-86
Report No:	50-443/01-12
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Station
Location:	Seabrook, NH 03874
Dates:	September 10-28, 2001
Inspectors:	John Caruso, Senior Operations Engineer Javier Brand, Resident Inspector Mel Gray, Reactor Inspector
Approved by:	David C. Lew, Chief Performance Evaluation Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000443-01-12, on 09/10-28/01; North Atlantic Energy Service Corporation; Seabrook Station; Unit 1, annual baseline inspection of the identification and resolution of problems. A violation was identified regarding problem evaluation.

The inspection was conducted by two regional inspectors and one resident inspector. One Green finding of very low safety significance was identified during this inspection and was classified as a non-cited violation. The issue was evaluated using the significance determination process. The significance of most findings is indicated by their color (Green, White, Yellow, or 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/NRR/OVERSIGHT/index.html.

Identification and Resolution of Problems

The team concluded that, based on the samples reviewed, the overall implementation of the corrective action program at Seabrook Station was acceptable. The licensee was identifying problems at an appropriate level and entering them into their corrective action program. The backlog of corrective actions appeared to be appropriately managed, and the actions taken for the identified problems were generally adequate to correct the problem and prevent recurrence. The licensee's evaluation of problems were generally of adequate depth to identify the causes and appropriately broad in considering the extent of condition. However, some examples were identified in which problems were not thoroughly evaluated to determine the cause or appropriately broad to address the extent of condition. One example, involving residual heat removal motor material deficiencies, was determined to be a Green finding. Additionally, as identified during NRC Special Inspections 50-443/00-011 and 01-005, the failures to evaluate problems in sufficient detail contributed to the failures of the B emergency diesel generator and turbine driven emergency feed pump.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. A non-cited violation of 10 CFR 50 Appendix B, Criterion XVI regarding the failure to determine the cause of material deficiencies associated with the "A" Residual Heat Removal (RHR) pump motor leads, and identify and take corrective actions to preclude recurrence. These material deficiencies included a normally torqued lug found to be finger tight and about half the strands to a motor lead found to be severed.

  The finding was determined to be of very low safety significance (Green) since these material deficiencies did not result in the loss of RHR train safety function, the "A" RHR pump continued to meet periodic surveillance test requirements, and the team did not identify other similar conditions on safety related motors.

Report Details

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution (71152)

a. Effectiveness of Problem Identification

(1) Inspection Scope

The team reviewed the licensee's corrective action program (CAP) procedures to understand the licensee's program for problem identification. The licensee identifies problems by initiating condition reports (CRs). Condition reports identifying problems are subsequently screened for operability, categorized by significance level (A through D) and assigned to personnel to evaluate the problem. Significance levels "A", "B" and "C" CRs are written to document conditions adverse to quality. Significance level "D" CRs are used to track action items for conditions that are not adverse to quality. The team noted that the licensee is on track to initiate approximately 12,000 CRs this year. The majority of these CRs were significance level "D", which track requests for engineering services or other business related requests.

The team selected and reviewed a sample of condition reports at each significance level to determine the licensee's threshold for problem identification. These samples are listed in Attachment 1. The samples were generally chosen to cover the time frame from the last problem identification inspection in August 2000 to the present. The team observed daily meetings where licensee personnel screened incoming condition reports.

The team reviewed items from the licensee's operating, maintenance, engineering, and quality assessment processes to determine if personnel were appropriately initiating CRs when problems were identified via these processes. For selected risk significant systems, the team reviewed applicable system health reports, work requests, plant register entries, and recurring maintenance task sheets. For these selected systems, the team also interviewed the cognizant system engineers and walked down portions of these systems.

(2) Findings

The team noted that the CAP was the licensee's primary process for identifying and resolving problems. The team determined that the licensee was identifying problems and entering them into the CAP at an appropriate threshold. However, the team identified two minor problems, which were not previously identified, involving snow loading of diesel air handling filters and diesel generator brush monitoring. These were minor problems when characterized using the group 1 and 2 questions (Appendix B of NRC Manual Chapter 0610*), and therefore, the SDP was not applied; however, these examples provide insights into the licensee's CAP performance and are being documented to support the team's assessment in this area.

The team identified a minor problem, where the licensee missed opportunities to identify a deficiency in the severe weather procedure and the guidance provided for potential snow loading of the diesel air handling (DAH) system roll-up filters. During a severe snow storm in March 2001, the DAH non-safety related roll-up filters were identified to have snow loading, potentially causing differential pressure problems in the diesel building. Operators took appropriate action to cut the filter media to maintain air intake flow. This problem had previously been identified on the primary auxiliary building and waste building roll-up filters, and was adequately addressed in the severe weather operating procedure for these filters. However, the severe weather operating procedure did not previously address the potential for snow loading of the DAH roll-up filters. The team questioned whether a CR had been initiated for this unexpected condition. In response, the licensee initiated CR#01-09579 to track an action to revise the severe weather procedure to ensure the DAH roll-up filters were monitored.

The team identified a minor problem, where the licensee missed opportunities to identify that diesel generator brush performance had not been monitored as expected. The licensee initiated CR#01-00714 in January 2001 to identify and address a minor arcing problem with the "B" diesel generator brushes. The licensee's corrective action was to reinitiate a recurring task sheet (RTS) to monitor the brushes during the monthly diesel engine surveillance test run. When the team requested the completed RTS, the licensee determined that the RTS sheets had not been consistently issued each month to coincide with the monthly diesel engine test. Consequently, the arcing condition was monitored intermittently. In response to this problem, the licensee initiated CR#01-09454 to track action to revise the monthly diesel engine surveillance procedures to include steps to monitor generator brush performance. The team noted the arcing problem continued to be characterized as minor or non-existent and did not affect diesel operation.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The team selected a sample of CRs, covering significance levels "A" through "D", to determine whether the licensee was properly evaluating and resolving problems adverse to quality. The sample was selected using risk insights from the licensee's Individual Plant Examination study. For each CR selected, the team reviewed the appropriateness of the assigned significance level, the scope and depth of the licensee's apparent or root cause evaluation and the priority assigned to evaluating the problem. The licensee's investigation into the extent of each problem was also reviewed. Some CRs were selected that evaluated problems involving previously identified NRC Violations. The team also reviewed the licensee's operability and reportability assessments completed for these problems.

(2) Issues and Findings

The team concluded the licensee generally prioritized and evaluated issues entered into the CAP in a timely fashion commensurate with the potential risk significance. The team determined the licensee's evaluations were generally of adequate depth to identify the causes and were appropriately broad in considering the extent of the condition. The licensee's assessments properly considered operability and reportability requirements. However, some examples were identified where problems were not adequately evaluated to determine cause, or where the extent of the problem was not considered. One example was determined to be a Green finding (i.e., of very low safety significance) and a violation of NRC requirements. The team identified several problems where the licensee did not adequately consider the extent of a condition regarding loose body to bonnet bolting, a transmitter calibration procedure, and with automatic mode of Diesel Air Handling system roll-up filter. These issues were minor when characterized using the group 1 and 2 questions (Appendix B of NRC Manual Chapter 0610*), and therefore, the SDP was not applied; however, these examples provide insights into the licensee's CAP performance and are being documented to support the team's assessment in this area. Additionally, as identified during NRC Special Inspections 50-443/00-011 and 01-005, the failures to evaluate problems in adequate detail contributed to the failures of the B emergency diesel generator and turbine driven emergency feed pump.

- Residual Heat Removal Motor Lead Material Deficiencies

Green. A non-cited violation of 10 CFR 50 Appendix B, Criterion XVI was identified regarding the failure to determine the cause of material deficiencies associated with the "A" RHR pump motor leads.

During the OR7 plant outage in November 2000, licensee maintenance personnel replaced the mechanical seal on the "A" RHR pump. During tagging of the "A" RHR pump motor, personnel identified and documented in Work Request #99W000228 that the Phase C motor terminal lug was found finger tight. This lug is tightened by procedure to 50 inch-pounds. The work request also documented that a few days later in the outage, when personnel intended to reconnect the motor leads, half of the strands on the Phase "C" motor lead were broken and the Phase "B" motor lead conductor had several broken strands. During the inspection the licensee was not able to determine whether the conductor strand deficiencies resulted from maintenance work during the outage or whether the conductors were found in this condition. The work request further documented that the motor terminal box had a minor crack.

The work request included a maintenance support evaluation to repair the motor leads and accept the motor terminal box with minor cracking. Additionally, CR#00-12902 was initiated to document acceptance of the motor terminal box with minor cracking. However, the team determined the licensee did not address causes of the finger tight Phase "C" lug condition, the motor lead conductor material deficiencies, and the terminal box cracking. Consequently, the licensee did not evaluate prior operability, the extent of this problem, or identify corrective actions intended to preclude recurrence of these conditions.

This issue is more than minor since a recurrence of loose RHR motor lugs and severed motor lead strands could credibly impact plant safety by decreasing the reliability of the RHR pump. This issue affects the mitigating systems cornerstone since, absent an identified cause and corrective actions to preclude recurrence, the potential for a recurrence of loose RHR motor lugs and severed motor lead strands could credibly affect the reliability of the RHR pumps to provide low head injection to mitigate the consequences of a loss of coolant accident and ensure long-term reactor core decay heat removal. However, the failure to identify the cause of the RHR motor lead material deficiencies was considered to have a very low safety significance using the SDP Phase 1 assessment screening worksheet. This issue is of very low safety significance (Green) since these material deficiencies did not result in an actual loss of RHR train safety function and the motor lead connectors have been repaired. The "A" RHR pump continued to meet periodic surveillance test requirements and the team did not identify other examples of loose motor lugs on safety related motors. During the inspection, the licensee initiated CR#01-10140 to evaluate this problem within their corrective action program.

10 CFR 50 Appendix B, Criterion XVI, requires that in the case of significant conditions adverse to quality, measures shall assure the cause of the condition is determined and corrective action taken to preclude repetition. The material deficiencies were considered to be significant conditions adverse to quality since they could affect the reliability of electrical power to the "A" RHR motor required to ensure the RHR pump performs its safety related functions. Contrary to this requirement, the licensee failed to determine the cause of the material deficiencies with the "A" RHR pump motor leads and ensure the corrective actions taken will preclude recurrence of these deficiencies. However, because of the very low safety significance and because the issue is in the licensee's corrective action program (CR#01-10140), it is being treated as a non-cited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 50-443/01-12-01**).

- Loose Body to Bonnet Bolting

The team identified an example, where the licensee had not fully evaluated the extent of condition on a licensee identified recurring problem (since 1994) regarding loose body to bonnet bolting on diaphragm type valves. These valves are used in several safety and non-safety systems such as charging, emergency boration flow path, spent fuel, reactor coolant, reactor make-up water, nitrogen gas, and waste liquid. On September 19, 2001, the team identified five similar valves with loose body to bonnet bolting, during a charging system walkdown. One valve had two bolts loose, while the others had only one bolt loose. The team noted that the corrective actions for this repetitive condition were limited to "Broke Fix" only, with some engineering involvement to recommend a method to prevent the bolts from becoming loose.

The licensee performed an evaluation to address the team's concerns under CR#01-09888, and determined that the bolts become loose when the valve rubber diaphragm relaxes due to normal aging or wear. The licensee also determined that the bolt loosening was not an operability concern because all the valves are installed in low pressure applications (max 150 psig). In addition, the licensee reviewed the eight

valves required for safe shutdown of the reactor or accident mitigation and verified that seven of these valves were verified to be properly operating on a quarterly basis; the eighth valve is a normally isolated valve and is verified operational every eighteen months. Evaluation of these eight valves determined that rigid supports are provided and the bolts are not expected to loosen further to the point of catastrophic failure during operation or a seismic event. The licensee has initiated actions to ensure that the system engineers inspect the safety-related diaphragm valves installed in their assigned systems for loose bolting. The team did not identify any examples where loose bolting actually resulted in any plant equipment being inoperable or unavailable. However, the licensee's actions to address this issue are examples of weak extent of condition review and weak implementation of the corrective action process.

- Transmitter Calibration Procedures

The team identified an example, where the licensee's evaluation of a transmitter calibration issue did not adequately consider the potential extent of the problem. In March 2001, the licensee identified a problem with the calibration results for the service water pump discharge pressure transmitters. The licensee initiated CR#01-02820 to evaluate the problem, and concluded that the 250 ohm resistor installed in accordance with licensee's calibration procedure increased the total loop resistance greater than that specified by the power supply manufacturer, and resulted in calibration problems at the upper end of the transmitter span. The licensee took corrective action to revise the service water calibration procedures to use a smaller resistor.

The team questioned whether the licensee's evaluation considered the potential for this problem to occur in other transmitters in a similar configuration with the same procedure requirements. The licensee initiated CR#01-10207 to review other procedures and determined that the "A" and "B" containment sump level transmitters loop configuration is similar to the service water transmitters and the calibration procedure specifies a 250 ohm resister be used. However, the licensee reviewed the most recent containment sump level calibration results and determined they were acceptable. The licensee tracked a corrective action to revise the containment sump level calibration procedures as a preventive measure to specify a smaller resistor during calibration.

- Diesel Air Handling Roll-up Filter Automatic Mode

The team identified an example, where the licensee's evaluation of problems with the DAH roll-up filter control circuit design had not been adequate to allow automatic filter advancement since plant start-up. Consequently licensee operations personnel, on rounds each week, manually advance the roll-up filters in accordance with log instructions. The Seabrook Safety Analysis Report (SAR), Section 9.4.8.2, describes both the DAH filter automatic and manual modes. The filter function to trap dust and particles is non-safety related; however, filter advancement is required to prevent high differential pressure from developing in the diesel area building. The team did not identify any concerns regarding the manual mode of DAH operation implemented by the licensee.

The licensee initiated CR#97-28804 in September 1997 to document that a design change in 1988 to replace the differential pressure switches had not been effective in

restoring the DAH automatic advancement mode; however, this CR was closed without resolving the problem. In May 2001, the licensee initiated a significance level "D" CR to task engineering services to reconsider the problem. As a result of inspector questions regarding the effectiveness of these evaluations, the licensee initiated CR#01-10063 to revise the SAR description of the DAH filters to credit manual mode of operation alone and resolve the issue.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The team reviewed the licensee's corrective actions associated with CRs' to determine whether the actions addressed the identified causes of the problems. The team also reviewed the licensee's timeliness in implementing corrective actions and their effectiveness in preventing recurrence of significant conditions adverse to quality. For selected risk significant systems, the team reviewed the backlog of corrective actions, both tracked within CRs and in work requests, to determine whether there were corrective actions that individually or collectively were of risk significance to plant safety.

(2) Findings

The team determined that the actions taken for the reviewed CRs were adequate to correct each of the problems specified in their evaluations and to prevent recurrence. The team also noted that the licensee appropriately scheduled and tracked these corrective actions to completion. The team did not identify items in the backlog that represented an adverse effect on plant risk. No findings of significance were identified in this area.

d. Assessment of Safety-Conscious Work Environment

(1) Inspection Scope

The team interviewed plant personnel to determine if people were hesitant to use the corrective action program to identify safety problems.

(2) Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented the inspection results to Mr. Ted Feigenbaum, and other members of licensee management, at the conclusion of the inspection on September 28, 2001. The licensee acknowledged the findings presented.

The licensee did not indicate that any of the information presented at the exit meeting was proprietary.

Attachments:
1: Partial List of Personnel Contacted
Items Opened, Closed, and Discussed
List of Acronyms
List of Documents Reviewed

KEY POINTS OF CONTACT

Licensee:

S. Barraclough	Operations Engineer
C. Berry	Corrective Actions Program Manager
M. Carmichael	Oversight Manager
T. Cooper	Maintenance Superintendent
J. Cote	System Engineer
S. Doody	System Engineer
K. Douglas	I&C Superintendent
J. Dupree	Maintenance Superintendent
T. Feigenbaum	Executive Vice President and Chief Nuclear Officer
W. Gagnon	Employee Concerns
M. Harvey	Nuclear Oversight Supervisor
R. Hayden	Maintenance Consultant
R. Hickok	Regulatory Compliance-NRC Coordinator
J. Klempa	System Engineer
A. Kodal	System Engineer
E. Lentz	Corrective Actions Program Specialist
T. Magnes	Procurement Engineering Manager
M. McNamara	Maintenance Supervisor
W. Moore	System Engineer
T. Murphy	Plant Engineering
M. Ossing	PI&R Team Coordinator
V. Pascucci	Nuclear Oversight Supervisor
J. Peschel	Regulatory Programs Manager
S. Perkins-Grew	Emergency Preparedness Manager
E. Pigott	System Engineer
B. Roach	Self-Assessment Program Manager
G. Sessler	System Engineer
R. Sherwin	Maintenance Manager
J. Sobotka	Supervisor - Regulatory Compliance
G. St. Pierre	Station Director
P. Stroup	Manager - Performance Improvement & Project Management
J. Warnack	Procurement Material Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened & Closed

50-443/01-012-01	NCV	Failure to determine the cause of material deficiencies associated with the “A” RHR pump motor leads and identify and take corrective actions to preclude recurrence. (IR Section 4OA2.b)

LIST OF ACRONYMS

CAP	Corrective Action Program
CR	Condition Report
DAH	Diesel Air Handling
I&C	Instrumentation & Controls
NRC	Nuclear Regulatory Commission
RHR	Residual Heat Removal
RTS	Recurring Task Sheet
SAR	Safety Analysis Report

LIST OF DOCUMENTS

ADMINISTRATIVE PROCEDURES AND MANUALS

1. Seabrook Station Operating Experience Manual, Rev.36, 7/2501.
2. Administrative Procedure OE 4.1, “Event Evaluation,” Rev. 8, 7/2001.
3. Administrative Procedure OE 4.3, “Root Cause Analysis,” Rev. 5, 7/20/01.
4. Administrative Procedure OE 4.5, “Operability Determination,” Rev. 7, 6/20/01.
5. Administrative Procedure OE 4.8, “Apparent Cause Evaluation,” Rev. 3, 7/25/01.
6. Administrative Procedure OE 7.1, “Operating Experience Review Program,” Rev. 4, 7/25/01.
7. Seabrook Self-Assessment Manual, Rev. 0, 3/31/00.
8. Seabrook Maintenance Manual, SSMA.
9. Seabrook Work Management Manual, WM.
10. Seabrook Operating Experience Reference, OERE, Rev. 5.
11. MS0519.39, Grinnell Diaphragm Valve Maintenance, Rev. 04.
12. NM 16421, Employee Concern Resolution Program, Rev. 06.

WORK REQUESTS

WR#98W000970
WR#98W000979
WR#99W000228
WR#99W001108
WR#99W001125
WR#00W000696
WR#01W000401
WR#01W001320
WR#01W001425

Recurring Task Sheets (RTS)

RTS 00RI05265001, Reactor Sump "A" Level Calibration, completed 10/23/00
RTS 00RI05266001, Reactor Sump "B" Level Calibration, completed 10/22/00
RTS 01RM45305011, Walkdown of "B" Diesel Generator During Monthly Surveillance
RTS 01RH00033002, Routine Clean-up Of Boric Acid From Various Plant Components

Condition Reports Associated with Non-Cited Violations

CR#00-13520, NCV 50-443/00-08-01
CR#01-04910, NCV 50-443/01-07-01

OTHER

1. I&C (instrumentation & Control) Calibration Procedure IS1672.320, "P-6183 Service Water.
2. Pump P110A Discharge Pressure Loop Calibration," Rev 4, change.
3. I&C Calibration Procedure IX1648.210, "1-LD-L-8332 Containment Building Sump A Level Calibration," Rev 5, change 4.
4. Operational Experience (OE) Item #11962, received March 2, 2001.
5. OE Item #12276, received May 22, 2001.
6. OE Item #10927, received April 25, 2000.
7. Seabrook Equipment/Operational Issues List.
8. Motor/Load List for Motor Control Center 1-EDE-MCC-521.
9. Design Change Request 87-0405, DAH Damper Replacement, November 1987.
10. Diesel Generator Building Air Handling System Performance Report, Issued March 2001.
11. Diesel Generator System Performance Report, Issued April 23, 2001.
12. Residual Heat Removal System Performance Report, Issued April 23, 2001.
13. Self Assessment 01-0270, Significant Level A Effectiveness Reviews, 8/22/01.
14. White Paper, "Emergency Diesel Generator Strainers," provided September 28, 2001.
15. Procedure OS1200.03, "Severe Weather Conditions," Rev. 10, change 3, 5/11/01.
16. Plant Engineering Register, PEG-53, Rev. 01.
17. POD Duty Supervisor/POD Duty Engineer Guidelines, PEG-18, Rev. 00.
18. Equipment Reliability List, PEG-36, Rev. 01.

19. Desktop Guidelines, PEG-19, Rev. 00.
20. Root Cause for Analysis for CR#00-05593.
21. Root Cause for Analysis for CR#01-08917.
22. Root Cause for Analysis for CR 01-02120.
23. Apparent Cause Evaluation for CR 01-08837.
24. Event Evaluation for CR 01-02120;CR 00-5593, action 3, Material Requester Quality Level “0" training notes.
25. Management Review Team Minutes of July 10, 2000.
26. Nuclear Oversight Audit Report No. 01-A05-01.
27. Corrective Action Program; Maintenance Leadership Expectations, dtd August 18, 2001; A Focus on Reliability, Plant Engineering Business Plan.
28. Safety Injection System Performance Report, March 2001.
29. Plant Engineering Action Plan Register for Safety Injection System.
30. Emergency Feedwater System Performance Report, March 2001.
31. Plant Engineering Action Plan Register for Emergency Feedwater System.
32. Nuclear Oversight Monthly Reports for April, May, June and July 2001.
33. Apparent Cause Evaluation for CR#01-06419.
34. Emergency Feedwater (a)(1) Improvement Plan.
35. Primary Component Cooling System Performance Report, March 2001.
36. Action Plan Register for Primary Component Cooling System.
37. Seabrook Station Mid-Cycle Self-Assessment Report (S/A No. 01-0087). Charging System CVCS) Walkdown Report, dated 8/2/01.
38. Containment Air Purge (CAP)/Containment On-line Purge (COP) Report, dated 3/2001.
39. ED/EDE-4.16KV & 13.8KV System Performance Report, dated 3/2001.
40. Containment Building Spray (CBS) Performance Report, dated 3/2001.
41. Service Water Air (SWA) System Performance Report, dated 3/2001.
42. Reactor Coolant (RC) System Performance Report, dated 3/2001.
43. NRC Bulletin No. 87-02, Fastener Testing to Determine Conformance with Applicable Material Specification.
44. NRC Information Notice 94-76, “Recent Failures Of Charging/Safety Injection Pump Shafts.
45. North East Utilities Memo dated June 11, 1990, “Modification of Letter Regarding Tufline Plug Valves”.
46. North East Utilities Memo dated May 11, 1990, “Millstone Nuclear Power Station, Unit No. 3, findings and potential Concerns Regarding Tufline Plug Valves”.
47. Plant Engineering Action Plan Registry, dated 3/24/00, CS-P-2A Temperatures.
48. Corrective Action Program, weekly Ownership & Accountability Health Report, dated 8/28/01.
49. Engineering Evaluation No. 92-39, Xomox Tufline plug Valve Cover Bolt Summary Report, dated November 17,1992.

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	05000443
License No:	NPF-86
Report No:	05000443/2001-013
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Station
Location:	Seabrook, NH 03874
Dates:	September 24-28, 2001
Inspectors:	R. Summers, Senior Project Engineer G. Morris, Reactor Inspector
Approved by:	James C. Linville, Chief Electrical Branch Division of Reactor Safety

SUMMARY OF FINDINGS

Seabrook Station
NRC Inspection Report 50-443/01-013

IR 05000443-01-013, on 9/24 - 9/28/2001; North Atlantic Energy Service Corporation; Seabrook Station; Unit 1. Supplemental Inspection Report.

The inspection was conducted by a region-based senior project engineer and a reactor inspector. The inspection identified no significant findings. The significance of most findings 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 http://www.nrc.gov/NRR/OVERSIGHT/index.html.

Cornerstone: Mitigating Systems

This supplemental inspection was performed by the NRC to assess the licensee’s evaluation associated with the inoperability of the "B" emergency diesel generator, which occurred on November 1, 2000. In NRC Special Inspection Report No. 50-443/00-011, and in a letter to Seabrook from Mr. Hubert Miller, dated June 29, 2001, the NRC identified a violation involving the licensee’s failure to promptly identify and correct conditions adverse to quality that resulted in the “B” diesel generator failure. This performance issue was characterized as having low to moderate risk significance ("White") in the referenced letter. During this supplemental inspection performed in accordance with Inspection Procedure 95001, the inspectors determined that the licensee performed a comprehensive evaluation of the inoperable diesel, including a subsequent failure of the engine No. 5 main bearing, which occurred on December 3, 2000. This additional failure had not been previously reviewed during the NRC Special Inspection. The inoperable diesel was identified by the licensee during the conduct of a surveillance test involving an endurance run of 24 hours. The licensee's evaluation identified that the cause of the No. 7 piston liner failure was uneven thermal expansion causing the piston liner to piston skirt tolerance to diminish to the point that scoring on the liner occurred. This resulted in the failure of the No. 7 cylinder and the crankcase explosion. Relative to the No. 5 main bearing failure, the licensee determined that the most probable causes were either inadequate bearing crush during bearing installation, or a loss of bearing lubricant film during post-repair engine break-in runs. Relative to the performance issue identified by the NRC, the licensee determined that the primary root cause (which can be attributed to the inoperable "B" EDG) was that identified degraded conditions were not properly evaluated for cause, corrective action, and extent of condition. This issue was not limited to the diesel generator and the licensee has taken corrective actions to ensure that identified problems are documented in their corrective action program so that they will be properly evaluated to prevent recurrence.

Due to the licensee's overall acceptable performance in addressing the inoperable diesel generator, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." Based on the adequacy of the licensee's evaluations, corrective actions taken and planned, and the information contained in the

licensee's letter dated July 27, 2001, Notice of Violation (NOV) 50-443/00-011-01 associated with the "B" emergency diesel generator failure has been closed.

Report Details

01 Inspection Scope

This supplemental inspection was performed by the NRC to assess the licensee's evaluation associated with the inoperability of the "B" emergency diesel generator engine (DG-1B) No. 7 piston/ liner failure and subsequent crankcase explosion that occurred on November 1, 2001. A performance issue was described in NRC Special Inspection Report No. 50-443/00-011, dated March 2, 2001, and a subsequent letter from Mr. Hubert Miller, Regional Administrator, NRC Region I Office, dated June 29, 2001. This performance issue is related to the mitigating systems cornerstone in the reactor safety strategic performance area.

The NRC finding and apparent violation involved the licensee's failure to promptly identify and correct conditions adverse to quality that resulted in the "B" diesel generator failure. In the June 29, 2001 letter, the NRC issued a Notice of Violation (NOV) describing the violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, and station procedures governing initiating condition reports for unwanted or unexpected conditions, as well as concluding that the violation was associated with a "White" Significance Determination Process finding. North Atlantic Energy Service Corporation replied to the NOV by letter, dated July 27, 2001, in which the causes and corrective actions taken to prevent recurrence for the violation were identified.

One of the corrective actions implemented following the No. 7 piston failure was a detailed inspection and evaluation of the collateral damage to the diesel engine. The licensee determined that the engine main bearings all exhibited some damage and concluded that the bearings needed to be replaced. Following completing this repair, as well as other maintenance on the diesel, several break in runs for the new bearings were scheduled. During a break in run on December 3, 2000, the No. 5 main bearing catastrophically failed causing significant damage to the engine that subsequently resulted in a complete overhaul. At the time of this main bearing failure, the licensee reopened the event and root cause team reviews being completed for the piston failure and developed additional root causes and corrective actions under a separate condition report, CR 00-13685. The diesel failure of December 3, was not reviewed during NRC Special Inspection, 50-443/00-011. As a result of the interrelated event evaluations and corrective action determinations for the two diesel failures, the inspection scope for this supplemental inspection required a review of both events.

The licensee initiated condition reports for the failure of the "B" EDG during testing on November 1, 2000, the failure of the No. 5 main bearing during post-repair break-in runs on December 3, 2000, and for the NOV issued by the NRC, dated June 29, 2001.

The NRC inspectors reviewed the above listed licensee evaluations of the diesel generator failures per Supplemental Inspection Procedure 95001. Also as part of this scope, the inspectors reviewed aspects of the licensee's corrective actions for the March 5, 2001, partial loss of offsite power event and the "B" emergency diesel generator lube oil system piping coupling failure that occurred during testing on September 19, 2001.

02 Evaluation of Inspection Requirements

02.01 Problem Identification

a. Determination of who (i.e., licensee, self revealing, or NRC) identified the issue, and under what conditions the issue was identified.

The failure of the No. 7 piston on DG-1B on November 1, 2000, was self revealing by the alarms for high crankcase pressure and high vibration alarm. The inspector determined that the licensee appropriately documented the failure in condition report (CR) 00-021215 and LER 50-443/ 00-008. The CR described in appropriate detail the circumstances involved in identifying the failure, and identified 20 action items and 19 daughter CRs.

The inspector determined that the failure of the No. 5 main bearing on DG-1B on December 3, 2000, was licensee identified during a post-overhaul, break-in run of the equipment. The licensee documented the failure in CR 00-13685. The CR identified several action items, including numerous recommendations by the licensee's vendors to prevent recurrence and improve emergency diesel generator performance.

The failure of the licensee staff to identify and evaluate conditions adverse to quality regarding the "B" emergency diesel generator cylinder liners in 1995 and 1999, was identified by the NRC in NRC Special Inspection Report 50-443/00-011. The licensee documented this failure in CR 01-06561 and in a letter to the NRC, dated July 27, 2001. The CR and letter described eight corrective actions and several program enhancements to address long term reliability of safety-related systems, beyond the immediate actions to restore the diesel generator to an operable condition.

b. Determination of how long the issue existed, and prior opportunities for identification.

Relative to the No. 7 piston failure event, the inspector determined the Event Evaluation documented a time line history depicting that the failure of the diesel generator had been developing for a few days (October 29, 2000), as evidenced by the increasing strainer differential pressure and increasing particulate buildup in the lube oil analyses. Regarding prior opportunities to identify the conditions leading to the failure, the licensee agreed with the NRC identified violation involving degraded cylinder liners in 1995 and 1999. As a result, the earlier identified degraded conditions were not evaluated for cause, corrective action and extent of condition.

Relative to the No. 5 main bearing failure event, the licensee determined that three probable causes were all related to initial use of new equipment (all the main bearings were replaced subsequent to the failure of the No. 7 piston) or involved "first time" evolutions, such as applying the appropriate "crush" for a newly installed bearing and conducting a complete flush, fill, and vent of the lube oil system. There were no prior opportunities for identification of this failure.

Relative to the failure to properly identify and evaluate conditions adverse to quality in 1995 and 1999 when cylinder liners were replaced, the licensee's evaluation concluded that the previous corrective action program, as well as the lack of reinforcement of

programmatic expectations after that program had been significantly revised in 1996, led to the failures of staff to properly identify (document in a condition report) and evaluate the condition adverse to quality. The inspector determined that the licensee's evaluation agreed with the NRC Special Inspection finding.

c. Determination of the plant specific risk consequences (as applicable) and compliance concerns associated with the issue.

Relative to the No. 7 piston failure event, the evaluation documented that the failure happened while the reactor was shutdown, all fuel had been removed from the core and stored in the spent fuel pool, and the diesel generator was out of service during surveillance testing. The evaluation also documented that the diesel generator had successfully passed its surveillance the previous month. The licensee concluded in its risk assessment (NYN-01030, dated April 6, 2001), that the event was not significant due to the timing of the failure, as well as their assessment that no fault exposure time was involved with the failure. Since the No. 5 main bearing failure also occurred under similar shutdown conditions, plant specific risk consequences were similar.

The NRC Special Inspection Report 50-443/00-011, also recognized that the actual failure occurred during an outage condition when the affected diesel generator was not required to be operable. However, the NRC concluded, in the letter dated June 29, 2001, which also transmitted the Notice of Violation 50-443/00-011-01, that some fault exposure time was creditable during the operating cycle resulting in the low to moderate risk significance determination. This assessment was acknowledged by the licensee in their response to the NOV in their letter NYN-01059, dated July 27, 2001.

02.02 Root Cause and Extent of Condition Evaluation

a. Evaluation of method(s) (e.g., Events and Casual Factors analysis, Fault Tree analysis, Barrier analysis, Change analysis, MORT) used to identify root cause(s) and contributing cause(s).

For both the No. 7 piston and the No. 5 main bearing failures, the licensee's Event Evaluation used the Kepner-Tregoe Analytical Trouble-shooting process. The Root Cause Analysis for the No. 7 piston failure used the Cause and Effect Diagraming process. No formal Root Cause Analysis was conducted for the No. 5 main bearing failure, however, the event evaluation was very detailed, including Cause and Effect Diagraming and supplemental vendor analyses, including a 3D finite analysis of the failed bearing and an equipment manufacturer analysis of the Seabrook diesel engine loading pattern during the break-in runs. The inspector determined that the licensee employed appropriate systematic methods to identify the root causes and contributing causes of the diesel engine failures.

b. Level of detail of the root cause evaluation.

Regarding the piston and main bearing failures, the Event Evaluation and the Root Cause were identified as Significance Level A (most important). Both evaluations were thorough and comprehensive. The licensee's evaluation identified that the cause of the No. 7 piston liner failure was uneven thermal expansion causing the piston liner to piston skirt tolerance to diminish to the point that scoring on the liner occurred. This resulted in the failure of the No. 7 cylinder and the crankcase explosion. Relative to the No. 5 main bearing failure, the licensee determined that the two most probable causes were either inadequate bearing crush during bearing installation, or a loss of bearing lubricant film during post-repair engine break-in runs. A third possible root cause involved a bearing manufacturing defect. This cause was subsequently determined by the licensee to be very unlikely. As mentioned above, a separate root cause was not completed for the main bearing failure. The licensee determined that the formal root cause analysis that had been previously completed for the piston liner failure had identified the process related causal factors common to both diesel failures and, therefore, the licensee determined a separate root cause analysis for the bearing failure was not necessary. The inspector determined that the decision to not conduct this evaluation was appropriately justified by the licensee.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

There were no prior occurrences of the piston/liner failure and crankcase explosion at the site. (Prior occurrences of degraded liners that were replaced without entering the condition into the corrective action program was identified by the NRC Special Inspection 50-443/00-011 as a performance finding.) The immediate indication of a pending problem on October 29, 2000 was with increasing lube oil strainer differential pressure and greatly increased particulate concentration in the lube oil. Failure to adequately address both of these indications was identified as a contributing cause. The licensee acknowledged that both items should have been resolved prior to the next test. (However, the damage had already been done and failure was unavoidable with the continuing tests.)

The inspector determined that the licensee's analysis, including that described in CR 01-06561, "NRC Violation - White Finding," appropriately included consideration of prior occurrences and knowledge of prior operating experience. Specifically, the prior occasions when the piston liners were replaced without proper identification and evaluation were considered contributing causes.

d. Consideration of potential common cause(s) and extent of condition of the problem.

The licensee evaluations considered the vulnerability of the "A" diesel generator (DG-1A) to the same failure mechanism that faulted the "B" diesel generator and took appropriate corrective actions.

The inspector observed that the licensee's initial evaluations for the diesel generator failures had narrowly focused reviews, such that only immediate corrective and preventive actions for the diesel resulted. Common cause concerns regarding conduct

of corrective maintenance and the need to initiate condition reports for unexpected or unwanted conditions, or extent-of-condition reviews beyond the emergency diesel generator system were not initially developed. The inspector determined that these activities were, however, completed through separate licensee actions resulting from the Equipment Reliability Blue Ribbon Report, CR 01-06822, and NRC Violation - White Finding, CR 01-06561. The inspector also observed that the licensee's extent-of-condition review for one of the contributing causes, involving inadequate operating experience reviews, was not initiated until after the March 2001, partial loss of offsite power event. This contributing cause was documented in CR 01-01837. While noting these observations, the inspector determined that the licensee had adequately addressed potential common causes and the extent-of-condition of the problem.

02.03 Corrective Actions

a. Appropriateness of corrective action(s).

The inspector determined that the licensee identified appropriate corrective actions for each root/contributing cause. As noted above, the inspector observed that some broader corrective actions regarding common cause and extent-of-condition evaluations beyond the diesel generator system were not implemented until after a Self Assessment following the March 2001, partial loss of offsite power event. The inspector also observed that several corrective actions for less significant problems associated with the event were prematurely closed without the work being fully completed. The licensee entered these observations into their corrective action program for evaluation as CR 01-10195 and 01-10202.

b. Prioritization of corrective actions.

The inspector determined that the corrective actions were prioritized with consideration of the risk significance and regulatory compliance. Corrective actions required for immediate resolution of the problem(s) were left in the original Level A condition reports (most significant classification under the licensee's program). Actions that were determined to prevent recurrence were also considered significance Level A. Corrective actions of lesser significance were identified in other lower level condition reports. For example, nineteen daughter condition reports were reviewed by the inspector with significance levels of C or D (least significance) for the No. 7 piston failure event. The inspector identified no concerns with the licensee's prioritization of actions regarding the diesel generator piston failure event. Similar corrective actions were developed for the No. 5 main bearing failure event and the NRC Violation - White Finding CRs. The inspector observed one case regarding a significance level D corrective action for the main bearing failure that should have had a higher priority, involving recommendations made by the equipment manufacturer that were of a preventive nature, including restrictions on use of the auxiliary lube oil pump and use of heavier lube oil. These recommendations were made to ensure an appropriate lubricating film on the bearings was maintained for all operating conditions and to reduce the probability of introducing an air slug into the main bearing casing. These recommendations should have been re-evaluated to have a higher priority, Level A. The licensee entered this observation into their corrective action program and corrected the prioritization in CR 01-10142. Further,

the licensee determined that this condition did not adversely affect the implementation of the corrective action.

c. Establishment of schedule for implementing and completing the corrective actions.

All corrective actions documented in the corrective action process have been assigned completion dates. All of the actions associated with the Level A condition report, except one, have been completed. The one remaining item addresses long term reliability improvement plans for other systems and was scheduled for March 2002.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

Regarding measures to assess the effectiveness of the corrective actions taken or planned, the inspector determined that the licensee has generally developed appropriate tracking methods to ensure completion of the required actions and to evaluate whether the problem recurs. Relative to the main bearing failure, appropriate measures were in place during the diesel overhaul to ensure both adequate bearing crush during installation and lube oil film during the diesel break-in runs. However, the inspector observed that no qualitative measure of effectiveness has been developed for the diesel generator cylinder liner condition. An anticipated qualitative acceptance criteria for cylinder liner polishing has not been supported by the diesel generator manufacturer. Some degree of cylinder liner polishing is an expected condition of normal operation. Too much polishing leads to a loss of lubricant film potentially contributing to uneven thermal expansion of the piston skirt and liner, which caused the piston failure. Currently, the licensee's maintenance procedure acceptance criteria is still based on the manufacturer's representative's judgement and experience. The licensee is working with the diesel generator owners group to establish appropriate quantitative or qualitative acceptance criteria to fully evaluate the effectiveness of the corrective actions.

4. OTHER ACTIVITIES (OA)

4OA4 Other

1. (Closed) NOV 50-443/00-011-01: Inadequate Corrective Actions related to degraded conditions of cylinder liners to DG-1B. Based on the adequacy of the licensee's evaluations, corrective actions, and the information contained in NOV reply letter dated July 27, 2001, NOV 50-443/00-011-01 associated with the "B" diesel generator failure has been closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Ted Feigenbaum, and other members of licensee management, at the conclusion of the inspections on September 28, 2001. The licensee acknowledged the findings presented. This exit meeting also served as the regulatory performance meeting per the NRC Reactor Oversight Process.

The licensee did not indicate that any of the information presented at the exit meeting was proprietary.

(2) SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

B. Beuchel	Event Team Leader
R. Hickok	Regulatory Compliance
G. Kotkowski	Electrical Engineering Supervisor
K. Letourneau	Electrical Design Engineering
M. Ossing	Supervisor, Nuclear Analysis
J. Peschel	Manager, Regulatory Programs
E. Pigott	DG System Engineer
J. Sobotka	Supervisor, Regulatory Compliance
G. St.Pierre	Station Director
J. Vargas	Director, Engineering

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

None

Closed

50-443/00-011-01	NOV	Inadequate Corrective Actions related to degraded conditions of cylinder liners to DG-1B.

LIST OF DOCUMENTS

Licensing Documents

UFSAR	Section 9.5.7, Diesel Generator Lubrication System
UFSAR	Fig. 9.5-13, Sh 2 DG Lube Oil System, Train B
Tech Spec	Section 4.8.1.1.2, Emergency Diesel Generator Surveillance
LAR 01-01	License Amendment Request, Changes to Electrical Power Systems

Condition Reports (CR)

00-00430	“B”DG lube oil temp low00-11909 ‘’B” DG lube oil strainer high dp
00-12025	’B” DG Shutdown on High Vibration on 11/01/2000
00-12126	DG A Lube oil strainer increasing dp Operability Determination
00-12075	“‘B’ DG FOST Particulate
00-12821	“B” DG Scavenging air temperature difference

00-13467-05	Enhance PM for piston scuffing and bore polishing
00-13468	Fuel Oil Strainer and Filter Enhancements
00-13469	Improve Oil Analysis Turn-around Time
00-13515	Evaluate Lube Oil
00-13685	‘’B” DG bearing failure during break-in run on 12/03/2000
01-00075	Provide guidance in T2000
01-00077	Mechanical Maintenance
01-00078	Vendor Support of MM
01-00080	Crankcase Vacuum Alarm
01-00081	DG Surveillance vs Reliability
01-00082	DG started with known problem of high strainer dp
01-00083	Failure to recognize degraded condition may impact operability
01-00084	PM Optimization assumptions
01-00119	Apply Lessons Learned to other Diesels
01-00158	Industry Operating Experience not used
01-00159	EDG lube oil analysis
01-00160	Reliance on internal expertise
01-00161	Cylinder liner inspection Acceptance Criteria
01-00162	Engine run monitoring
01-00165	Trip reports
01-00623	“B” DG Lo Jacket Water Temperature too low
01-00657	DG Rebuild NCR 01-0007
01-01837	Self-Assessment Documentation
01-02115	Failure to adequately address arcing of the 345 kV bushings
01-02138	DG Jacket Water Temp.
01-03114	INPO Guidelines for Decision Making
01-03472	Revise T2000 Dates
01-05030	Root Cause Error (typo)
01-06561	White Finding for DG Event
01-06578	O.E. Program
01-06618	DG Lube Oil System Enhancements
01-06822	Equipment Reliability Improvement Initiatives

Engineering Evaluations (EE)

EE 010001	Rev.0	DG Operability During Cycle 7
EE 01003	Rev.0	Significance Determination for 11/1/00Failure of the “B” DG

Event Evaluations

Associated with CR 00-12025	Emergency Shutdown of DG “1B” and Crankcase explosion
Associated with CR 00-13685	Emergency Shutdown of DG "1B" during loaded break-in run

Root Cause Evaluations

(Associated with CR 00-11909 & 12126 Lube Oil Strainer High DP)
Associated with CR 00-12025 ‘’B” DG Emergency Shutdown
Associated with CR 00-13685 ‘’B” DG bearing failure

Procedures and Guidelines

MS0539.18	EDG Piston and Liner Maintenance, Rev. 03, Chg. 19
MS0539.41	EDG Engine Crankcase Inspection, Rev. 01, Chg. 05
-	Roving NSO Log, Blank, (Rev. 08/09/01)
PEG-17	Plant Engineering Guideline, Station Support, Rev. 01
PEG-33	System/Component Performance Reports, Rev. 02
PEG-46	Long Term System/Component Reliability Plan, Draft
PEG-211	Diesel Generator System Performance Monitoring, Rev. 00, (formally PEG-67)
WM 8.0	Work Control Practices, Rev. 01, Chg. 04

Drawings

NHY-310857	Sh BP6a, DG-1B Auxiliary Lube Oil Pump Schematic Diagram, Rev. 5
NHY-310857	Sh BP6d, DG-1B Auxiliary Lube Oil Pump Control Wiring Diagram, Rev. 1
NYH-503484	DG Auxiliary Lube Oil Pump Logic Diagram, Rev. 5
NYH-503492	DG Shutdown and Start Logic, Rev. 6
NYH-506401	DG-1A Lube Oil System Control Loop Diagram, Rev. 13
NYH-506402	DG-1B Lube Oil System Control Loop Diagram, Rev. 15

Training Materials

L1714C	Degrading Trends in DG Performance, Rev. 11/21/00

Work Orders (WO)

00W001984	As-found Piston and Liner Readings for “B” DG, November 2000

Self-Assessments

01-0180	Expert Panel Equipment Reliability Review for Selected Systems, 3/27/01

Surveillance Data

-	“B” DG Engine Combustion Reports, 1999 and 2000

Vendor Manuals/Documents

P12605100-2	Colt-Pielstick Connecting Rod
NCR 01-0007	Rebuild and Repair of the Seabrook “B” DG (CR 01-00657)

NRC Inspection Reports

50-443/00-011
50-443/01-005

NRC Generic Communications

GL 83-41	Fast Cold Starts of Diesel Generators
GL 94-01	Removal of Accelerated Testing for Emergency Diesel Generators
RG 1.9	Selection, Design, Qualification and Testing of Emergency Diesel Generator Units, Rev. 3

Correspondence

NYN-01018	License Amendment Request 01-01
NYN-01059	Reply to Notice of Violation, July 27, 2001
TeleCon	Notes of 9/27/01 NAESC call with Mobil Lubrication Engineering

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CR	Condition Report
DG/EDG	(Emergency) Diesel Generator
DP	Differential Pressure
EE	Engineering Evaluation
LER	Licensee Event Report
NAESC	North Atlantic Energy Service Corporation
NCR	Non-Conformance Report
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NSO	Nuclear Station Operator
OEP	Operating Experience Program
PEG	Plant Engineering Guideline
PM	Preventive Maintenance
RG	Regulatory Guide
ROP	Reactor Oversight Process
RTS	Repetitive Task Sheets
SDP	Significance Determination Process
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report