September 11, 2000

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: NRC's SEABROOK INSPECTION REPORT NO. 05000443/2000-006

Dear Mr. Feigenbaum:

On August 19, 2000, the NRC completed an inspection at your Seabrook Nuclear Power Station. The enclosed report presents the results of this inspection. The results were discussed on August 25, with Mr W. Diprofio and members of your staff.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. The physical protection program was also inspected during this period. This included a revisit by the Operational Safeguards Response Evaluation team to verify, through table-top exercises and contingency drills, the effectiveness of the protective strategy and its implementation.

The NRC identified one issue involving an inadequate procedure for testing the atmospheric steam dump valves, that was evaluated under the risk significance determination process and determined to be of very low safety significance (Green). The issue has been entered into your corrective action program and is discussed in the summary of findings and in the body of the attached inspection report. This issue was determined to involve a violation of NRC requirements. Consistent with the NRC Enforcement Policy, the violation is not cited. If you contest 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 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 Station.

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Sincerely,

/RA/

James C. Linville Chief Projects Branch 6 Division of Reactor Projects

Docket No. 05000443 License No: NPF-86

Enclosure: NRC Inspection Report No. 05000443/2000-006

cc w/encl:

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	05000443	
License No.:	NPF-86	
Report No.:	05000443/2000-006	
Licensee:	North Atlantic Energy Service Corporation	
Facility:	Seabrook Generating Station, Unit 1	
Location:	Post Office Box 300 Seabrook, New Hampshire 03874	
Dates:	July 1 - August 19, 2000	
Inspectors:	Raymond Lorson, Senior Resident Inspector Javier Brand, Resident Inspector Kenneth Jenison, Senior Project Engineer Greg Smith, Senior Physical Security Inspector, DRS Paul Frechette, Physical Security Inspector, DRS	
Approved by:	James Linville, Chief Projects Branch 6 Division of Reactor Projects	

SUMMARY OF FINDINGS

IR 05000443-00-06, on 07/01-08/19/2000; North Atlantic Energy Service Corporation; Seabrook Station; Unit 1. Post-Maintenance Testing.

The report covers a seven week period of resident and security specialist inspection. The significance of issues is indicated by their color (GREEN, WHITE, YELLOW, RED) and was determined by the Significance Determination Process (SDP) in draft inspection Manual Chapter 0609 (see Attachment 1 for a description of the new reactor oversight process).

Cornerstone: Mitigating Systems

• Green. The inspector identified, during post-maintenance testing on the 'C' atmospheric steam dump valve (ASDV), that the reactor operator failed to identify that the valve operated faster than specified. The emergency operating procedures require that the ASDVs operate properly to isolate a faulted steam generator (closed direction) and to provide a method for conducting a primary plant cooldown (open direction). The licensee attributed the valve operating problem to the improper positioning of the ASDV control switch and determined that the test procedure did not provide adequate guidance for performing this activity. The test procedure deficiency had the potential to mask a degraded valve operating condition. The ASDV operated properly during follow-up testing. This issue was considered green in the significance determination process since the actual valve operation was not affected by the test procedure problem. The inspectors identified a non-cited violation for an inadequate test procedure (Section 1R19).

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Report Details

<u>Summary of Plant Status</u>: The plant was operated at approximately 100% power for the duration of the inspection period.

1. REACTOR SAFETY Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R05 <u>Fire Protection</u>

a. Inspection Scope

The inspector toured four areas important to reactor safety to observe that the control of combustible materials and ignition sources, the material condition and line-up of fire protection equipment, and the condition of fire barriers were consistent the Seabrook Station Fire Protection Program document. The areas toured included: the primary auxiliary building, spent fuel pool (SFP) storage building, essential switchgear rooms, and emergency diesel generator (EDG) rooms.

b. Findings

There were no findings identified during this inspection.

1R07 <u>B' Emergency Diesel Generator Heat Exchanger Performance Monitoring</u>

a. <u>Inspection Scope</u>

The inspector reviewed the licensee's program for testing the 'B' EDG heat exchanger capacity. The licensee developed this program in response to NRC Generic Letter 89-13 to demonstrate that the heat exchanger would be capable of removing the projected EDG heat load during design basis conditions. The review was performed to determine whether the licensee had an adequate technical basis to conclude that the heat exchanger would be able to perform its safety-related function.

The inspector observed a 'B' EDG heat exchanger performance test, examined 'B' EDG heat exchanger performance test data, and reviewed the following documents:

- Updated Final Safety Analysis Report (UFSAR) Section 9.5.5.
- A licensee calculation performed to determine the heat exchanger performance during design conditions based on the test data.
- A sensitivity analysis performed to demonstrate that the heat exchanger had adequate margin to compensate for the potential uncertainties associated with the collection of test data.

The inspector also reviewed the following condition reports that were generated during this inspection:

• Condition Report (CR) 00-008925, which discussed a difference between the actual heat exchanger capacity and the UFSAR design value. The difference resulted from the plugging of tubes in the heat exchanger.

- CR 00-09151, which indicated that the programmatic controls for performing the heat exchanger performance testing should be formalized.
- b. <u>Findings</u>

1R12 Maintenance Rule Implementation

a. <u>Inspection Scope</u>

The inspector reviewed problems involving selected in-scope systems, structures, and components (SSCs) to assess the effectiveness of the maintenance rule program. The reviews focused on proper maintenance rule scoping, characterization of failed SSCs, safety significance classifications, 10 CFR 50.65 (a)(1) and (a)(2) classifications, and performance criteria for SSCs classified as (a)(2), or goals and corrective actions for SSCs classified as (a)(1). The inspectors reviewed the licensee's scoping documents, system health reports, corrective actions, and maintenance rule functional failure (MRFF) determinations. The following SSCs were reviewed:

- SFP Cooling system
- Component Cooling Water system
- 4 Kv Electrical system
- EDG and Support Systems
- Service Water (SW) and SW Cooling Tower System

b. Findings

There were no findings identified during this inspection.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspector sampled, through direct observation and/or document review, several emergent maintenance activities to determine whether the licensee properly evaluated and controlled these activities per work management procedure, WM 10.1, "On-Line Maintenance." The inspector also performed an independent evaluation of the effectiveness of troubleshooting activities and the documentation of the problems in the licensee's corrective action and work control systems. The following work activities were reviewed:

- 00W0000848, failure of the standby battery for the SW cooling tower refill pump
- 00W0001245, EDG air system relief valve lifting
- 00W001386, failure of vital inverter 1E

b. Findings

There were no findings identified during this inspection.

1R15 Operability Evaluation

.1 Service Water Pump Evaluation

a. Inspection Scope

The inspector reviewed final operability determination (OD) 98-14, Revision 1 which had been developed to address a pump shaft and bearing degradation problem (discussed in NRC Inspection Report 99-04). In addition to OD 98-14 review, the inspector examined SW pump shaft vibrational data, and interviewed engineering personnel to determine whether the licensee had an adequate technical basis for concluding that the SW pumps were operable.

b. Findings

There were no findings identified during this inspection.

- .2 Power Range Nuclear Instrument Channel Comparator Alarm
- a. Inspection Scope

The inspector reviewed the technical adequacy of the licensee's response to and evaluation of a power range nuclear instrument channel comparator alarm that occurred on July 26. The licensee determined (discussed in CR 00-08879) that the power range nuclear instruments were operating properly and attributed the alarm to a reactor vessel lower plenum anomaly.

The inspector reviewed a vendor memorandum dated September 27, 1995, which indicated that this anomaly would have a minor impact on the departure from nucleate boiling ratio (DNBR) margin for fuel cycles four and five. The inspector discussed this issue with the Reactor Engineering Manager who indicated that the anomaly would also have a similar minor impact on the DNBR margin for fuel cycles six and seven.

b. Findings

There were no findings identified during this inspection.

1R16 Operator Workarounds

a. Inspection Scope

The inspector reviewed the operator work-around list and operator logs to evaluate the potential impacts on the operators' ability to implement abnormal or emergency operating procedures. The inspector also walked down the control room panels, evaluated alarmed conditions and interviewed control room operators to ensure that applicable control room deficiencies were captured in the licensee's work-around list. The criteria contained in licensee procedures for compensatory measures, on line maintenance prioritization, on line risk evaluation, and work control as they pertained to operator workarounds were also reviewed.

b. Findings

There were no findings identified during this inspection.

1R17 Permanent Modifications

- .1 Emergency Diesel Generator Air Compressor
- a. Inspection Scope

The inspector reviewed a permanent modification to the EDG air starting system. The inspector verified that the materials, seismic qualification, and functional properties of the backup air compressors and associated piping and wiring were appropriate for the intended application. The associated equipment response time and annunciator response and operating procedures were also verified to be appropriate under accident/event conditions. The licensee's safety evaluation, calculations and design basis updates were reviewed to ensure that they were updated and technically accurate.

The inspector reviewed test data, engineering calculations, and instrument calibration data to determine whether the EDG backup air compressor met design and licensing bases requirements. The test scope and acceptance criteria were reviewed to determine if they were technically adequate, had clear acceptance criteria, and demonstrated the equipment's capability to perform in the conditions established by its design basis. The range and accuracy of test equipment was evaluated. This inspection sample included a review of the following documents:

- Design Change Request (DCR) 94-012, EDG air compressor
- Maintenance procedure, RM24601001, "Maintenance Test of the EDG Backup Air Compressor"
- Operations procedure, OX1026.04, "Operating Procedure for EDG Backup Air Compressor"

b. Findings

There were no findings identified during this inspection.

.2 Control Building Air Conditioning Compressor

a. Inspection Scope

The inspector reviewed the vendor test package (qualification report QR-055010-2) for the recently installed safety-related control building air conditioning (CBA) compressors. The CBA compressors were installed per DCR 98-0039 to improve the reliability of the CBA system. The inspector reviewed the qualification report to determine whether the pre-installation testing demonstrated that the CBA units could remove the design basis heat load from the control room. Additionally, the inspector reviewed the licensee's response to several test anomalies that were identified by the vendor.

b. Findings

There were no findings identified during this inspection.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspector reviewed the post-maintenance test package, operating procedures OX1430.04, "Main Steam System Valve Operability Tests and OX1456.81, "Operability Testing of IST Valves," and observed a portion of the post-maintenance testing following the replacement of the regulating air supply valve diaphragm for atmospheric steam dump valve MS-PV-3003.

b. Findings

The inspector observed that the valve operated faster in the opening direction than specified in the test acceptance criteria in procedure OX1456.81. The reactor operator did not recognize this equipment operating problem and verbally reported that the valve operated properly. The inspector questioned the valve operating problem and the licensee subsequently attributed the valve operating problem to improper positioning of the MS-PV-3003 control switch. The licensee re-performed the testing with the control switch in the correct position and the valve operated satisfactory.

The licensee initiated CR 00-8390 to review this condition and determined that operations procedure OX1430.04 did not provide adequate guidance regarding positioning of the control switch during the testing. The licensee revised the procedure to correct this problem. The ASDV valves are required by the emergency operating procedures to operate properly in both the open (to perform a primary plant cooldown) and closed (to isolate a faulted steam generator) directions. The test procedural deficiency discussed above had the potential to mask a degraded ASDV operating condition. The failure to provide adequate controls for testing the ASDV was considered

a green finding in the significance determination process since the valve was found to operate properly during the subsequent testing.

Technical Specification 6.7.1, requires, in part, that written procedures be implemented for activities described in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33, requires, in part, that written procedures be developed for surveillance testing of safety-related components. Contrary to the above, the licensee did not implement an adequate procedure for testing MS-PV-3003. This is a violation of TS 6.7.1. This low risk, licensee corrected, violation is being treated as a non-cited violation consistent with the NRC enforcement policy. (NCV 00-06-01)

The post-maintenance test package did not provide explicit direction to operate valve MS-PV-3003 from the manual-automatic station. This was necessary to ensure that the maintenance activities were effective. The operator reported that the valve had been operated successfully from the manual-automatic station during the testing. The licensee initiated CR 00-08638 to review this concern. The inspector noted that the proper testing had been performed and did not consider the test package issue a violation.

1R20 Refueling and Outage Activities

a. <u>Inspection Scope</u>

The inspector performed a review of the licensee's new fuel receipt inspection for conformance to the applicable procedure, and witnessed activities associated with this evolution. The inspector also performed independent visual inspections on four new fuel assemblies and their respective shipping containers.

b. Findings

There were no findings identified during this inspection.

1R22 Surveillance Testing

a. Inspection Scope

The inspector observed surveillance testing of the solid state protection system (SSPS) and the turbine driven emergency feedwater pump monthly valve alignment surveillance, to verify that the systems and components were capable of performing their intended safety function, to verify operational readiness, and to ensure compliance with required technical specifications (TS) and surveillance procedures. The following documents were also reviewed for this inspection.

- Procedure IX1680.921, Solid State Protection system (SSPS) Train A Actuation Logic, Revision 8, Change 5.
- Procedure OX1436.02, Turbine Driven Emergency Feedwater Pump quarterly and 18 Month Surveillance test and Monthly Valve Alignment, Revision 8, Change 6.
- RTS-00RI05578005, SSPS Train A Actuation Logic Test

- RTS-R003053009, Turbine Driven Emergency Feedwater Pump Monthly Valve Alignment.
- b. <u>Findings</u>

1R23 Temporary Plant Modifications

a. <u>Inspection Scope</u>

The inspector reviewed several open and closed temporary modifications, including the 10 CFR 50.59 safety evaluations, the individual and aggregate impact of the temporary modifications on operator actions and the on-line risk assessment, the potential impact on the applicable system design basis and/or FSAR chapter 15 analysis assumptions, operator training (when appropriate), temporary drawing changes and system operability/availability. The inspector also verified control room operator aids and equipment tags associated with selected temporary modifications. The criteria contained in licensee procedures for compensatory measures, on line maintenance prioritization, on line risk evaluation, and work control, as they pertained to temporary modifications, were also reviewed. The temporary modifications were reviewed for the following systems: containment spray, primary component cooling water, post-accident sampling, 120 volt, vital AC, and the EDGs.

b. Findings

There were no findings identified.

3. SAFEGUARDS Cornerstone: Physical Protection

- 3PP1 Access Authorization Program (71130.01)
- a. Inspection Scope

The following activities were conducted to determine the effectiveness of the licensee's behavior observation portion of the personnel screening and fitness-for-duty programs:

Five supervisors representing the Maintenance, Site Support Services, Work Control & Outage, Craft Supervision and Instrumentation & Control Departments were interviewed, on August 1 and 3, 2000, regarding their understanding of behavior observation responsibilities and the ability to recognize aberrant behavior traits. Two (2) Access Authorization/ Fitness-for-Duty self-assessments, an audit, and event reports and loggable events for the four previous quarters were reviewed, during this inspection. On August 1 and 3, 2000, five (5) individuals, who perform escort duties, were interviewed to establish their knowledge level of those duties. Behavior observation training procedures and records were also reviewed.

b. Findings

3PP2 Access Control (71130.02)

a. <u>Inspection Scope</u>

The following activities were conducted during the period July 31 - August 4, 2000 to verify that the licensee had effective site access controls, and equipment in place designed to detect and prevent the introduction of contraband (firearms, explosives, incendiary devices) into the protected area:

A random sample of ten (10) percent of personnel, granted unescorted access to the protected and vital areas, was checked to assure that they were properly screened, identified and authorized. Site access control activities were observed, including personnel and package processing through the search equipment at the access point during peak ingress periods on August 1 and 2, 2000, and vehicle searches, on July 31, 2000. On August 1, 2000, testing of all access control equipment; including metal detectors, explosive material detectors, and X-ray examination equipment, was observed. The Access Control event log, an audit, and three (3) maintenance work requests were also reviewed.

b. Findings

There were no findings identified during this inspection.

3PP3 Operational Safeguards Response Evaluation (OSRE) (81110)

a. <u>Inspection Scope</u>

This inspection was conducted to validate the licensee's recently revised protective strategy. During the original OSRE, conducted January 10-13, 2000, a flaw was identified in the protective strategy. At that time, the licensee took immediate action and modified the strategy; however, the OSRE team was unable to thoroughly evaluate the modified strategy and the protective strategy evaluation was considered incomplete. During the licensee's validation process for the modified strategy after the OSRE, it was determined that additional modifications were necessary. The additional modifications were made and the licensee adapted the modified protective strategy after a validation process was completed.

The purpose of this inspection was to evaluate the licensee's protective strategy and its implementation. The inspection consisted of:

- A briefing and site tour to review responder deployment positions and plant modifications made to harden defensive positions and increase adversary time-lines.
- The conduct of four table-top, time-line exercises to verify effectiveness of the protective strategy and the contingency response team.

- The conduct of two Force-on-Force drills to validate the licensee's ability to effectively execute the protective strategy.
- b. <u>Findings</u>

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspector reviewed the accuracy and completeness of several of the licensee's performance indicators (PI) data. Specifically, the Safety System Functional Failures PI, the Transients and Unplanned Scrams PIs and the Safety System Unavailability PI for the charging, emergency feedwater, residual heat removal, and emergency AC power systems were verified and validated. The review included a comparison of the data to confirmatory plant records, operating logs, and procedures. Additionally, the inspector interviewed applicable licensee personnel and evaluated the licensee's data collection techniques for these PIs.

Additionally, the inspectors reviewed the licensee's programs for gathering and submitting data for the Fitness-for-Duty, Personnel Screening, and Protected Area Security Equipment Performance Indicators. The review included the licensee's tracking and trending reports, personnel interviews and security event reports for the Performance Indicator data submitted from the second quarter of 1997 through the first quarter of 2000.

c. Findings

There were no findings identified during this inspection.

4OA3 Event Follow-up

- .1 (Closed) LER 50-443/00-004: Manual Reactor Trip and ESF Actuation Due to a Steam Generator Low-Low Level Condition. This event was discussed in Inspection Report 2000-05. No new information was provided in the LER. This LER is closed.
- .2 (Closed) LER 50-443/00-002: Control Room Emergency Makeup Air and Filtration System Inoperable. This LER was a minor issue and is closed.
- 40A4 Other

<u>(Closed) IFI 50-443/00201-01</u>: Evaluation of the licensee's protective strategy incomplete. See Section 3PP3 for details of the completed evaluation of the licensee's protective strategy.

40A5 Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. Diprofio and other members of licensee management on August 4, 2000 (following the conclusion of the physical security inspection), and on August 25, 2000, following completion of the period. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Diprofio, Unit Director

- J. Grillo, Assistant Station Director
- G. StPierre, Operations Manager
- T. Nichols, Technical Support Manager
- D. Sherwin, Maintenance Manager
- J. Pandolfo, Security Manager
- P. Ryan, Security Supervisor
- E. Moore, Security Supervisor
- J. Marchi, Audit Manager
- A. Schultz, Security Training
- M. Ossing, NRC Coordinator

NRC PERSONNEL

R. Lorson, Senior Resident Inspector

D. Orrik, NRR, Security Specialist

PARTIAL LIST OF DOCUMENTS REVIEWED

FFD/CBO Supervisor Training

Nuclear Oversight Audit 00-A04-02, "Physical Security", May, 2000 Access Authorization, Fitness For Duty, and Licensed Operator Medical Exams Programs Security Loggable event report, 10/99-5/00

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened:

NCV 00-06-01: Failure to Develop an Test Adequate Procedure for the Atmospheric Steam Dump Valve

Closed:

LER 50-443/00-004:	Manual Reactor Trip and ESF Actuation Due to a Steam Generator Low-
	Level Indication
LER 50-443/00-005:	Control Room Emergency Make-Up Air and Filtration System Inoperable
IFI 50-443/00201-01:	Evaluation of the licensee's protective strategy incomplete
NCV 00-06-01:	Failure to Develop an Adequate Test Procedure for the Atmospheric
	Steam Dump Valve

LIST OF ACRONYMS USED

ASDV	Atmospheric Steam Dump Valve
CBA	Control Building Air Conditioning System
CR	Condition Report
DCR	Design Change Request
DNBR	Departure From Nucleate Boiling Ratio
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
LER	Licensee Event Report
MRFF	Maintenance Rule Functional Failure
OD	Operability Determination
PI	Performance Indicator
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SSC	Systems, Structures, and Components
SW	Service Water
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report

Attachment 1

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

Radiation Safety

Safeguards Physical Protection

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness
- Occupational
- Public

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.