April 30, 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 REPORT 05000443/2001-003

Dear Mr. Feigenbaum:

On March 31, 2001, the NRC completed an inspection at the Seabrook nuclear power station. The enclosed report documents the inspection findings which were discussed on April 13, 2001, with Mr G. St. Pierre and other members of your staff.

No findings of significance were identified.

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

Sincerely,

/RA/
Curtis J. Cowgill, Chief
Projects Branch 6
Division of Reactor Projects

Docket No. 05000443
License No: NPF-86

Enclosure: NRC Inspection Report No. 05000443/2001-003

Attachment: Supplemental Information

cc w/encl:
B. D. Kenyon, President and Chief Executive Officer
J. M. Peschel, Manager - Regulatory Programs
G. St. Pierre, Station Director - Seabrook Station
D. Roy, 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 and Chief Executive Office, BayCorp Holdings, LTD
R. Hallisey, Director, Dept. of Public Health, Commonwealth of Massachusetts
M. Metcalf, Seacoast Anti-Pollution League
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
S. Comley, Executive Director, We the People of the United States
W. Meinert, Nuclear Engineer
S. Allen, Polestar Applied Technology, Incorporated
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DATE	04/30/01		04/30/01						

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	05000443
License No.:	NPF-86
Report No.:	05000443/2001-003
Licensee:	North Atlantic Energy Service Corporation
Facility:	Seabrook Generating Station, Unit 1
Location:	Post Office Box 300 Seabrook, New Hampshire 03874
Dates:	February 18, 2001 - March 31, 2001
Inspectors:	Russell Arrighi, Acting Senior Resident Inspector Javier Brand, Resident Inspector Thomas Moslak, Health Physicist
Approved by:	Curtis J. Cowgill, Chief Project Branch 6 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000443-01-03; on 2/18 - 3/31/2001, North Atlantic Energy Service Corporation; Seabrook Station; Unit 1. Resident Inspection Report.

The inspection was conducted by the resident staff and a health physicist specialist. 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) . 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. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Violations

There were no violations identified by the licensee during this inspection.

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Report Details

Summary of Plant Status: The plant was operating at approximately 100% power since the beginning of the period until March 5, 2001, when the plant experienced a momentary loss of power to the station buses, resulting in a main turbine trip and subsequent reactor trip. The momentary power loss was caused by arcing (shorting) of the 345 KV "B" phase bushings, due to snow build-up. Emergency Operating Procedure E-0, "Reactor Trip or Safety Injection" was entered and a discretionary Unusual Event was declared. On March 15, operators performed a reactor start-up; reactor power was limited to 70% due to main condenser tube leaks. On March 20, operators initiated a plant shutdown from 70% to 18% power, and took the main turbine off-line, due to controller problems in the turbine electro-hydraulic control system. The plant returned to 100% power operation on March 26.

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

1R04 Equipment Alignment

a. Inspection Scope

.1 Complete Walkdown (71111.04)

The inspectors performed a complete walkdown of the accessible portions of the safety injection (SI) system. The walkdown involved reviews of the system's operating procedure (OS1005.05), piping and instrument drawing (1-SI-B20446), and an in-plant verification of system alignment. The inspectors also reviewed the SI system performance report, open work orders, operations work around list and condition reports to assess any outstanding SI equipment and/or component deficiencies. The inspectors confirmed that the system was properly aligned to support normal and emergency plant operations.

.2 Partial Walkdown (71111.04)

The inspectors walked down critical portions of the "A" and "B" emergency diesel generators (EDGs) and the control room following the March 5 Unit trip. The inspector also performed a documentation review and partial system walkdown of the 345 KV termination yard, the 345 KV switchyard, and the relay room to verify equipment alignment and material condition of the 345 KV switchgear. This included a review of the unit auxiliary transformers (UATs) and reserve auxiliary transformers (RATs). Documents reviewed included: procedure OS1046.04, "345 KV Operations", Revision 5, and ECA-0.0, "Loss of All AC Power," Revision 23A.

The inspectors performed the following system walkdowns to ensure that the redundant systems were properly aligned in accordance with plant procedures and system drawings. The inspectors also observed whether any material deficiencies where present that could challenge the operability of the redundant train:

- During the "B" EDG planned maintenance outage, the inspectors performed partial system alignment checks of the "A" EDG and the turbine driven

emergency feedwater (TDEFW) pump which are required to be available whenever the "A" EDG is out of service.

- The inspectors performed a partial system walkdown of the service water (SW) cooling tower system while the ocean SW system was secured to support replacement of the "A" ocean SW pump.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope (71111.05A)

On March 27, 2001, the inspector observed an unannounced fire drill on the 25 foot elevation on the primary auxiliary building (PAB) in a plant area determined to be risk significant by the licensee's fire risk analysis. The purpose of the inspection was to monitor the fire brigade's use of personal protective equipment and fire fighting equipment, to verify that the fire fighting pre-plan procedures and appropriate fire fighting techniques were used, and to verify that the fire brigade leader's directions were thorough, clear and effective.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope (71111.11)

On March 22, 2001, the inspector observed the performance of an operations crew in the plant simulator to ensure the crew met the event scenario objectives and performed the critical tasks. The training scenario tested operator response to an event that involved several equipment problems including: a dropped rod, an anticipated transient without scram event, and the failure of a power operated relief valve. The inspector verified proper use of emergency procedures, crew communications, command and control, and verified that the post scenario critique included a discussion of any relevant lessons learned. The inspector verified that identified deficiencies during the scenario were discussed with the crew to enhance future performance. Additionally, the inspector reviewed whether the event classification and off-site agency notifications were consistent with NUREG 1022, "Event Reporting Guidelines," and emergency response procedures, ER 1.1, "Classification of Emergencies," and ER 1.2, "Emergency Plan Activation."

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope (71111.12)

The inspector reviewed problems involving selected in-scope systems, structures, and components (SSC) to assess the effectiveness of the maintenance rule program. The review focused on proper maintenance rule scoping, characterization of failed SSCs, and 10 CFR 50.65 (a)(1) and a(2) classifications. The inspector reviewed the licensee's scoping documents, system health reports, condition reports (CR), and maintenance rule functional failure (MRFF) determinations. The following SSCs were reviewed:

- Proper classification of equipment failures for the SI system during the previous 24 months. Various condition reports were reviewed including CR 00.06501 (Failure of SI pump, SI-P-6A, to start).

- The inspector reviewed CR 01-02315, and CR 01-02120, which included the MRFF determination and event evaluation and corrective actions for an emergency feedwater (EFW) pump turbine overspeed trip that occurred on March 5, during the Unit trip. The licensee determined that the overspeed trip of the TDEFW pump was a MRFF and changed the classification of the EFW system to category (a)(1) per the maintenance rule.

- The inspector reviewed the implementation of the maintenance rule for the SW system which is classified as category (a)(1) per the maintenance rule due to premature failures of the pumps. The review included: the identification and resolution of maintenance rule related problems, the characterization of system failures, and the appropriateness of the goals and plans to restore the system to the category (a)(2) , "acceptable performance" status. The inspector verified that the licensee recovery plan to systematically replace all six SW pumps was being implemented.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope (71111.15)

The inspectors reviewed the following open operability determinations (ODs) to ensure that the identified conditions did not adversely affect safety system operability or plant safety.

- OD98-06, SW pump P-110A stainless steel bolts, nuts, and shaft threads, crevice corrosion.

- OD 98-08, Bent spent fuel pool cooling pump P-10A, trust bearing probe.

- OD 98-014, Degradation of the chromium oxide coating applied to the service water pumps (SW P-41A, 41B, 41C), in the bearing journal area.

- OD 98-015, Erratic operation of the component cooling water (CCW) check valve CC-V-98, and excessive leakage past CCW valves CC-V944, 945,946, and 947.

- OD 01-01536, Degradation of the actuator "O" ring for the main feedwater isolation valves.

- OD 01-01544, Failure to perform required stud inspections of the residual heat removal cold legs injection isolation checks valves RH-15 and RH-30, after replacement, due to body to bonnet leakage.

In addition, the inspectors reviewed preliminary operability determination OD 01-02671. This OD evaluated a condition identified by the inspectors following the March 5 trip of the TDEFW pump. The issue involved water venting out of two high point vent lines connecting to two out of three independent drain pots. The drain pots are designed to remove condensate generated after the steam supply valves open and prior to pump start, to prevent a water slug from entering the TDEFW pump, which could cause a turbine overspeed. The vents enhance pipe heat-up and condensate formation, and are designed to vent condensate in the event of a drain system failure. The inspectors also reviewed Technical Reports TR-7239-1, "Seabrook EFW Pump Turbine Supply Line Condensate Removal Study for Larger Orifice Areas," dated February 6, 1990, and TR-7239-2, Revision 0, "Seabrook EFW Pump Turbine Supply Line Condensate Distribution With Larger Orifice Areas," dated March 27, 1990. The OD determined that the excess water was due to leakage past the two steam supply valves MS-V393 and 394, and that no operability concern existed because the third steam drain pot and associated steam traps were sufficient to handle any additional condensing steam resulting from the leaking steam supply valves. The OD concluded that this issue was not the cause for the TDEFW pump overspeed trip that occurred on March 5, 2001.

b. Findings

No findings of significance were identified

1R19 Post-Maintenance Testing

a. Inspection Scope (71111.19)

The inspectors reviewed the scope of the post-maintenance test activities, attended several pre-evolution briefings, reviewed the test data, interviewed plant personnel, and/or observed portions of the test activities following the completion of several maintenance activities including:

- Replacement of the "A" and "D" SW pumps,
- Replacement of the TDEFW pump rotor and pump mechanical seals,

- Inspection and replacement of the electric driven emergency feedwater pump bearings,
- Starter inspection of containment building spray (CBS) valve CBS-V47, and
- Inspection of SW-V139 valve actuator.

b. Findings

No findings of significance were identified.

Emergency preparedness (EP)

1EP6 Drill Evaluation

a. Inspection Scope (71114.06)

The inspectors observed portions of the March 28, 2001, combined functional drill 01-01 to evaluate the drill conduct and adequacy of the licensee's critique. The inspectors focused on the event classification and notification, and communication of priorities among the emergency response organization. Through observation of the critique, the inspectors verified that identified problems were entered into the licensee's corrective action program.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS2 ALARA Planning and Controls

a. Inspection Scope (71121.02)

During the period March 26-30, 2001, the inspectors conducted the following activities to determine the effectiveness of administrative, operational, and engineering controls to minimize and equalize personnel exposure for tasks conducted during power operations.

The inspectors reviewed pertinent information regarding cumulative exposure history for the past eighteen months, current exposure trends, and ongoing activities in order to assess the licensee's effectiveness in establishing exposure goals and keeping actual exposure as low as is reasonably achievable.

The inspectors reviewed the following post-job ALARA Reviews (AR) associated with activities conducted during the November 2000 refueling outage for the adequacy of lessons to be learned and applied in future outages:

- AR 00-01, Reactor vessel disassembly/reassembly

- AR 00-02, Steam generator eddy current testing & tube plugging
- AR 00-03, Steam generator secondary side maintenance
- AR 00-09, Fuel handling
- AR 00-16, Scaffolding installation & removal

The inspectors evaluated the exposure controls specified in ALARA Evaluations for recently completed jobs and for jobs scheduled to be performed later this year. Included in this evaluation were Work Requests (WR) WR99W003029, Charging pump lube oil pressure switch replacement, WR00W000328, remove/inspect B-residual heat removal pump motor bearing, WR99RM12040002, inspect activator on flow control valve 610, and Design Change Request (DCR) DCR 99-018, cut/cap supply & return to letdown monitor & remove booster pump.

Independent radiological surveys were performed in areas of the Primary Auxiliary Building, Decay Heat Vaults, and Waste Processing Building to confirm posted survey results and assess the adequacy of radiation work permits and associated controls. Included in these measurements was a contamination survey of the B-Safety Injection Pump Room.

The inspectors inventoried keys to locked high radiation areas and, during plant tours, verified that these areas were properly secured and posted.

Individual exposure records were reviewed for completed tasks and for those currently in progress. Interviews were conducted with an Instrumentation & Control Department supervisor and the Fix-It-Now (FIN) Team supervisor to assess departmental efforts to minimize and equalize dose to their respective staffs.

Performance was observed of selected work groups preparing for a containment entry, during power operations. The inspector attended the pre-entry job briefing on March 29, 2001, reviewed the RWP (01-R-10), and interviewed selected workers to evaluate their knowledge of radiological controls applied to their tasks.

The inspectors attended a Condition Report Review Committee meeting on March 28, 2001, and a Radiation Safety Committee meeting on March 29, 2001, to evaluate the licensee's threshold for identifying problems regarding implementation of the radiation protection plan and the promptness and effectiveness of the resulting corrective actions. Additionally, selected CRs were evaluated against the criteria contained in 10 CFR 20, site Technical Specifications, and site procedures to determine the regulatory significance of the identified problem. Included in this review were CRs: 00-14278, 01-00510, 01-01871, 01-02161, 00-00190, 01-02040, 01-00181, 01-00228, 01-00636, 01-00449, 01-01063, 01-01195, 01-01804, 01-00979, 01-00457, 01-00641, 01-01591, and 01-00768.

In evaluating the effectiveness of the licensee's problem identification and resolution program, the inspector reviewed a Nuclear Oversight Departmental audit (00-A01-01) and recent Heath Physics Departmental self-assessments.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

Occupational Exposure Control Effectiveness (71151)

a. Inspection Scope

The inspectors selectively examined records used by the licensee to identify occurrences involving locked high radiation areas, very high radiation areas, and unplanned personnel exposures. The information contained in these records was compared against the criteria contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 0, to verify that all conditions that met the NEI criteria were recognized, identified, and reported as a performance indicator. The records reviewed included CRs and various ARs addressing individual and collective exposures.

b. Findings

No findings of significance were identified.

OA3 Event Follow-Up

Reactor Trip

a. Inspection Scope

The inspectors reviewed the licensee's response to the reactor trip that occurred on March 5, 2001. The plant trip was due to a momentary loss of AC power to the station buses, during a severe snow storm. The momentary loss of power was caused by arcing (flashover) from line to ground across the 345 KV "B" phase bushings. The inspector examined plant alarm and process data to evaluate the response of plant equipment to the trip, observed operator performance shortly following the trip, and reviewed the licensee's immediate actions to address equipment problems that occurred during the event.

b. Findings

No findings of significance were identified.

4OA5 Other

The inspectors reviewed the Institute of Nuclear Power Operations (INPO) report that documented the results of the two week INPO inspection conducted in June 2000.

4OA6 Meetings, including Exit

The inspectors presented the inspection results to Mr. G St. Pierre on April 13, 2001, following the conclusion of the period. Additionally, the inspectors met with members of licensee management following the conclusion of the ALARA radiation protection inspection. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials evaluated during the inspection were considered proprietary. No proprietary information was identified.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

M. Campbell, Rad Technical Specialist, Planning
W. Cash, Health Physics Department Manager
W. Cox, Radiological Technical Specialist
M. DeBay, Asst. Operations Manager
J. Grillo, Assistant Station Director
P. Harvey, Chemistry Department Manager
R. Hickok, NRC Coordinator
W. Leland, Chemistry/Health Physics Manager
W. Meyer, Jr, Health Physics Technician
T. Nichols, Technical Support Manager
J. Pandolfo, Security Manager
M. Perkins, Health Physics Technician
B. Plummer, Operations Manager
D. Robinson, Chemistry Department Supervisor
D. Sherwin, Maintenance Manager
J. Sobotka, Regulatory Compliance Supervisor
G. St. Pierre, Station Director
R. Sterritt, Radiation Technical Specialist, ALARA

b. List of Items Opened, Closed and Discussed

None

c. List of Documents Reviewed

Generation and Control of Radiation Work Permits	HN 0958.13
Administrative Guidelines for Health Physics Instrumentation	HD0963.02
Personnel Survey & Decontamination Techniques	HD0958.03
Job Pre-planning and Review for Radiation Exposure Control	RP 15.1

Radiation Safety Committee Meeting 00-04 Minutes
Radiation Safety Committee Meeting 00-03 Minutes
Radiation Safety Committee Meeting 01-01 Handouts
Health Physics Self-Assessment Report - HP Condition Report Trend Analysis (00-0312)
Health Physics Self-Assessment Report - ORO7 Electronic Dosimetry (00-0307)
Health Physics Self-Assessment Report - HP Condition Report Trend Analysis (01-0011)
Nuclear Oversight Audit No. 00-A10-02, ORO7 Outage Audit, Radiation Protection Program
EPRI Source Term measurement Trend Report (Outages 1 through 7)

d. List of Acronyms

ALARA	As Low As is Reasonably Achievable
AR	ALARA Reviews
CR	Condition Report
CBS	Containment Building Spray System
CCW	Component Cooling Water
DCR	Design Change Request
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
EP	Emergency Preparedness
FIN	Fix-It-Now
INPO	Institute of Nuclear Power Operations
MRFF	Maintenance Rule Functional Failure
NEI	Nuclear Energy Institute
OD	Operability Determinations
PAB	Primary Auxiliary Building
PARS	Publicly Available Records
RAT	Reserve Auxiliary Transformer
RWP	Radiation Work Permit
SDP	Significance Determination Process
SI	Safety Injection
SSC	Structure, System, or Component
SW	Service Water
TDEFW	Turbine Driven Emergency Feedwater
UAT	Unit Auxiliary Transformer
WR	Work Requests