

September 3, 2002

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

SUBJECT: SEABROOK STATION - NRC TRIENNIAL FIRE PROTECTION INSPECTION
REPORT NO. 50-443/02-009

Dear Mr. Feigenbaum:

On July 26, 2002, NRC completed a triennial fire protection team inspection at your Seabrook Generating Station. The enclosed report documents the inspection findings which were discussed at an exit meeting on July 26, 2002, with Mr. J. Peschel and other members of the North Atlantic Energy Service Company staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's regulations and with the conditions of your license. The purpose of the inspection was to evaluate your post-fire safe shutdown capability and fire protection program. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings of significance were identified.

This inspection was a reduced scope inspection in accordance with the March 23, 2001, revision to IP 71111.05, "Fire Protection." Issues regarding equipment malfunction due to fire-induced failures of associated circuits were not specifically inspected as a result of the criteria for review of fire-induced circuit failures currently being the subject of a voluntary industry initiative.

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Sincerely,

/RA/

James C. Linville, Chief
Electrical Branch
Division of Reactor Safety

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

Enclosure: NRC Inspection Report 50-443/02-009

cc w/encl:

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Ted C. Feigenbaum

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-443

License No: NPF-86

Report No: 50-443/02-009

Licensee: North Atlantic Energy Service Company

Facility: Seabrook Station

Location: P.O. Box 300
Seabrook, NH 03874

Dates: July 8-12 and 22-26, 2002

Inspectors: R. Fuhrmeister, Sr. Reactor Inspector, DRS
L. Cheung, Sr. Reactor Inspector, DRS
J. Yerokun, Sr. Reactor Inspector, DRS

Approved By: James C. Linville, Chief
Electrical Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000443/02-009, on 7/8-12/02 and 7/22-26/02. Seabrook Station. Fire Protection.

The inspection was conducted by a team composed of regional specialists. The team 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).

This inspection was a reduced scope inspection in accordance with the March 23, 2001, revision to IP 71111.05, "Fire Protection." Issues regarding equipment malfunction due to fire-induced failures of associated circuits were not inspected. Criteria for review of fire-induced circuit failures are currently the subject of a voluntary industry initiative. The definition of associated circuits of concern used was that contained in the March 22, 1982, memorandum from Mattson to Eisenhut, which clarified the requests for information made in Generic Letter 81-12.

A. Inspector Identified Findings

Cornerstone: Initiating Events

- The team identified no significant findings.

Cornerstone: Mitigating Systems

- The team identified no significant findings.

Report Details

Background

This report presents the results of a triennial fire protection team inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05, "Fire Protection." The objective of the inspection was to assess whether North Atlantic Energy Service Company (NAESCO) has implemented an adequate fire protection program and that post-fire safe shut down capabilities have been established and are being properly maintained. The following fire areas were selected for detailed review based on risk insights from the Seabrook Station Probabilistic Safety Study:

- Turbine Building
- Main Control Room
- Primary Auxiliary Building, Component Cooling Water Pump Area
- Switchgear Room "A"

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1. REACTOR SAFETY **Cornerstones: Initiating Events, Mitigating Systems**

1R05 Fire Protection (71111.05)

.1 Programmatic Controls

a. Inspection Scope

During tours of the facility, the team observed the material condition of fire protection systems and equipment, the storage of permanent and transient combustible materials, and control of ignition sources. The team also observed equipment used for safe shutdown from the main control room (MCR), at the "A" Switchgear room and at the emergency diesel generator (EDG) "A" room.

b. Findings

No findings of significance were identified.

.2 Passive Fire Barriers

a. Inspection Scope

During tours of the facility, the team evaluated the material condition of fire walls, fire doors, and fire barrier penetration seals to ensure that NAESCo was maintaining the passive features in a state of readiness.

The team randomly selected two fire barrier penetration seals for detail inspection to verify proper installation and qualification. The team reviewed associated design drawings, test reports, and engineering analyses. The team compared the observed in-situ seal configurations to the design drawings and tested configurations. Additionally, the team compared the penetration seal ratings with the ratings of the barriers in which they were installed. This was accomplished to verify that the licensee had installed the selected penetration seals in accordance with their design and licensing bases.

The team also reviewed the test report for the three hour rated fire wall erected between the "A" and "B" switchgear rooms. The team observed the material condition of the wall, and penetrations through the wall.

b. Findings

No findings of significance were identified.

.3 Fire Detection Systems

a. Inspection Scope

The team performed a walkdown of the selected fire areas to verify the existence and adequacy of fire detection systems in the selected fire areas. In addition, the team reviewed surveillance procedures and smoke/heat detection installation system drawings to verify the adequacy and frequency of fire detection component testing. This review was performed to ensure that the fire detection systems for the selected fire areas met their design and licensing bases.

b. Findings

No findings of significance were identified.

.4 Fixed Fire Suppression Systems and Equipment

a. Inspection Scope

The team evaluated the material condition of the automatic sprinkler systems in the target areas. The team evaluated the system installation against the requirements of NFPA 13 sprinkler systems installation. The team also evaluated the adequacy of the water supplies for the sprinkler systems.

b. Findings

No findings of significance were identified.

.5 Manual Fire Suppression Capability

a. Inspection Scope

The team walked down selected standpipe systems and portable fire extinguishers to determine the material condition of manual fire fighting systems. Electric fire pump flow, diesel fire pump flow, and pressure tests were also reviewed by the team to ensure the pumps were meeting design requirements. Additionally, the team reviewed recent fire main loop flow tests and a standpipe calculation to ensure adequate flow and pressure could be delivered to hose and sprinkler systems. The team reviewed the pre-fire plans for the target fire areas to verify accuracy of the plans versus the installed fire protection features in the selected fire areas. The team reviewed fire brigade training program and lesson plans.

The team inspected the fire brigade's protective ensembles, self-contained breathing apparatus (SCBA), portable communications equipment and various other fire brigade equipment to determine material condition and operational readiness of equipment for fire fighting.

b. Findings

No findings of significance were identified.

.6 Safe Shutdown Capability

a. Inspection Scope

The team reviewed the Updated Final Safety Analysis Report (UFSAR), the Fire Hazards Analysis (FHA), Design Basis Documents (DBD), and the Safe Shutdown Analysis, to evaluate the methods and equipment used to achieve hot shutdown following postulated fires in the selected fire areas. The following areas were selected for review:

- Control Building - El. 75 ft. - 0 inches, Fire area CB-F-3A-A, Main Control Room
- Control Building - El. 21 ft. - 6 inches, Fire area CB-F-1A-A, Train A Switchgear Room
- Primary Auxiliary Building, Fire Area PAB-F-2C-Z
- Turbine Building, Fire Areas TB-F-1A-Z, TB-F-1C-Z, TB-F-2-Z, TB-F-3-Z

The team further reviewed piping and instrumentation drawings (P&IDs) for post-fire safe shutdown systems to determine required components for establishing flow paths and to identify equipment required to isolate flow diversion paths. The team verified that systems necessary to assure the safe shutdown functions of reactivity control, reactor coolant makeup and reactor heat removal, as well as the process monitoring instrumentation were protected or independent from the selected areas.

The team reviewed system flow diagrams, electrical schematics and one line diagrams to evaluate the adequacy of the alternate shutdown transfer and isolation capability for safe shutdown control functions.

The team performed field walk-downs to validate the equipment locations considered in the analysis and to evaluate the protection of the equipment from the effects of fires.

The team reviewed the procedures associated with shutdown following a fire, to confirm the availability of selected components required for different fire scenarios. The procedures reviewed are listed in the supplemental information.

The team reviewed preventive maintenance and testing procedures and the maintenance records for the Appendix R circuit breakers to determine if the licensee was appropriately maintaining them in a state of readiness. These procedures were reviewed to determine if the circuit breakers that provide electrical power and provide protection to post-fire safe shutdown components could operate when called upon.

b. Findings

No findings of significance were identified.

.7 Safe Shutdown Analyses

a. Inspection Scope

The team reviewed Seabrook Appendix R Safe Shutdown Capability, Revision 5 to assess the adequacy of the methodology applied in the analysis for assuring that circuits required for safe shutdown were identified and protected. The team also reviewed the electrical one line diagrams, control panel diagrams, control circuit schematic diagrams, cable tray designations, remote shutdown panel and isolation circuit drawings, fire zone/area arrangements drawings, panel and rack diagrams, design and operating procedures, circuit breaker coordination curves, coordination calculations, and modifications, to verify the conclusions of selected sections of the safe shutdown analysis and to ensure that procedures, equipment, and fire barriers are in place so that the post-fire capability exists to safely shut down the plant. The review was conducted focusing on the following areas:

- Control Building - El. 75 ft. - 0 inches, Fire area CB-F-3A-A, Main Control Room
- Control Building - El. 21 ft. - 6 inches, Fire area CB-F-1A-A, Train A Switchgear Room
- Primary Auxiliary Building, Fire Area PAB-F-2C-Z
- Turbine Building, Fire Areas TB-F-1A-Z, TB-F-1C-Z, TB-F-2-Z, TB-F-3-Z

The team also walked down portions of cable routing to confirm that the cables required for safe shutdown would not be impacted by postulated fires in the areas.

Due to the issuance of Change Notice 00-020 against Inspection Procedure 71111.05, "Fire Protection," the team did not review associated circuit issues during this inspection.

This change notice has suspended this review pending completion of an industry initiative in this area.

b. Findings

No findings of significance were identified.

.8 Operational Implementation of Post-Fire Safe Shutdown Capability

a. Inspection Scope

The team reviewed post-fire shutdown procedures that would be used to achieve safe shutdown during a fire in any one of the selected areas to determine if appropriate information is provided to plant staff to perform required actions to achieve and maintain safe shutdown. This review included a comparison of the procedures with the safe shutdown analysis to ensure that the actions assumed in the safe shutdown analysis were included in the procedures.

The team also reviewed the test procedure and test results of the remote safe shutdown system to determine if the licensee had adequately demonstrated the operability of the remote shutdown system to be used following an evacuation of the control room.

b. Findings

No findings of significance were identified.

.9 Post-Fire Safe Shutdown Emergency Lighting and Communications

a. Inspection Scope

The team observed the placement and aim of independent battery-powered emergency lighting units throughout the plant to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation for post-fire safe shutdown.

b. Findings

No findings of significance were identified.

.10 Electrical Raceway Fire Barrier Systems (ERFBS)

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design and installation of the ERFBS. In addition, the team reviewed the qualification test information and NRC Information Notices relating to the ERFBS material.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team reviewed a sample of open condition reports (CRs), and those closed within the past year, which had been issued for fire protection program and equipment problems identified by NAESCo personnel. The purpose of the reviews was to evaluate the ability of NAESCo to identify and correct fire protection problems.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

The inspectors presented their preliminary inspection results to Mr. J. Peschel and other members of the NAESCo staff at an exit meeting on July 26, 2002.

The inspectors asked whether any materials examined during the inspection should be considered proprietary. Proprietary documents were returned to NAESCo at the end of the inspection.

PARTIAL LIST OF PERSONS CONTACTED

North Atlantic Energy Service Company

J. Peschel, Regulatory Programs Manager
D. Roy, Training Manager
S. Folsom, Nuclear Oversight Manager
V. Pascucci, assistant Oversight Manager
M. DeBay, Assistant Operations Manager
M. Kiley, Assistant Maintenance Manager
R. LeGrand, Work Control and Outage Manager
M. Lewis, Modifications and projects Manager
D. Conti, Fire Protection Supervisor
R. Hickok, NRC Coordinator
R. Fanning, Senior Reactor Operator
E. Trump, Fire Protection Engineer
R. Jamison, Electrical Engineer

Nuclear Regulatory Commission

G. Dentel, Senior Resident inspector
J. Brand, Resident Inspector
M. Barillas, Reactor Inspector
J. Linville, Chief, Electrical Branch
A. Patel, Engineer Intern

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

DBD	Design Basis Document
EDG	Emergency Diesel Generator
ERFBS	Electrical Raceway Fire Barrier System
FHA	Fire Hazards Analysis
MCR	Main Control Room
NAESCo	North Atlantic Energy Service Company
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
P&ID	Piping and Instrumentation Drawing
SCBA	Self Contained Breathing Apparatus
SDP	Significance Determination Process
UFSAR	Updated Final Safety Analysis Report

LIST OF DOCUMENTS REVIEWED

Fire Protection Program Documents

Updated Final Safety Analysis Report, Section 9.5.1
FP2.1, Rev. 5, Change 2, Control of Ignition Sources
FP2.2, Rev. 06, Change 02, Control of Combustible Materials
FP 2.3, Rev. 3, Change 2, Fire Protection Equipment Operation and Disablement
FP 2.4, Rev. 04, Fire Watches and Fire Patrols
FP2.5, Rev. 05, Change 01, Control of Portable Heaters
FP 2.8, Rev. 00, Change 02, Fire Detection Isolation for General Nuisance Alarms
FP 3.1, Rev. 01, Change 06, Fire Protection Maintenance and Surveillance Testing
FP 4.1, Rev. 06, Change 02, Fire Protection Training and Qualification
FP 5.1, Rev. 04, Fire Brigade Response
FP 5.2, Rev. 03, Ready Areas and Pre-Fire Strategies

Piping and Instrumentation Drawings

PID 1-SW-B20794, Service Water Nuclear Detail, Revision 28
PID 1-SW-B20795, Service Water Nuclear Detail, Revision 34
PID 1-RC-B20840, Reactor Coolant System Overview, Revision 6
PID 1-CS-B20725, Chemical & Volume Control Charging System Detail, Revision 23
PID 1-CS-B20722, Chemical & Volume Control System Heat Exchangers Detail, Revision 9
PID 1-CS-B20726, Chemical & Volume Control System Seal Water Detail, Revision 19
PID 1-CBS-B20233, Containment Spray System, Revision 26
PID 1-FW-B20686, Feedwater System Details, Revision 11
PID 1-FW-B20688, Emergency Feedwater System Details, Revision 17
PID 1-RC-B20846, Reactor Coolant System Pressurizer, Revision n13

Control Circuit Schematics

9763-F-500093, Control Building Remote Safe Shutdown Control Panel MM-CP-108A, Revision 16.
9763-F-500375, Control Building Remote Safe Shutdown Control Panel MM-CP-108B, Revision 16.
1-NHY-506199, CC-HX E-17A Control Loop Diagram, Revision 17.
1-NHY-506198, CC-HX E-17B Control Loop Diagram, Revision 18.

Design Drawings

1-NHY-506634, Control Loop Diagram, RC-Letdown Isolation Valves, Revision 11
1-NHY-503804, Logic Diagram, RC-Letdown Isolation Valve, LCV-459 Train "A," Revision 4
1-NHY-503752, Logic Diagram, RC-Letdown Isolation Valve, LCV-460, Train "A," Revision 6
1-NHY-310002, Unit Electrical Distribution One Line Diagram, Revision 32.
1-NHY-310007, 4160V Switchgear Bus 1-E5 One Line Diagram, Revision 18.
1-NHY-310008, 4160V Switchgear Bus 1-E6 One Line Diagram, Revision 17.
1-NHY-310013, 480V Unit Substation Buses 51 & 52 One Line Diagram, Revision 18.
1-NHY-310014, 480V Unit Substation Buses 61 & 62 One Line Diagram, Revision 17.
Penetration Seal 1-CB-021-CB101-1015
Penetration Seal 1-CB-021-CB101-1016
Foreign Print 4491D, Bisco Typical Installation Drawings

Conduit Wrap Drawing JKM/JB-1
Conduit Wrap Drawing JKM/JB-2
Conduit Wrap Drawing JKU/JB-1
Conduit Wrap Drawing JKU/JB-2
Foreign Print 4860D, 3M Conduit Wrap Package

Equipment Location Drawings

9763-F-310765, Primary Auxiliary Building Elev 25' North Exposed Conduit Layout Plan, Revision 28.
9763-F-310763, Primary Auxiliary Building Elev 7' North Exposed Conduit Layout Plan, Revision 32.

Engineering Evaluations/Modifications/Safety Evaluations/Change Requests

Fire Protection of Safe Shutdown Capability, 10 CFR 50, Appendix R, Safe Shutdown Capability, Revision 5.
Engineering Evaluation 87-024, Rev. 1, Basis for Not Requiring Door Closures on Selected Fire Doors
Engineering Evaluation 97-41, Rev. 0, Fire Detector Inspection Frequencies
Engineering Evaluation 95-30, Fire Damper Inspection Requirements
Engineering Evaluation 96-07, Evaluation of Installed 3M Fire Wrap to NRC Information Notice 95-52
Engineering Evaluation SS-EE-97-0006, Rev 00, Evaluation of Cure Time for Silicone Foam Air Seals
Engineering Evaluation SS-EE-97-007, Rev. 00, Evaluation of Protective Floor Matting and Floor Coverings Throughout the Station
Engineering Evaluation SS-EV-970011, Rev. 00, Combustible Materials Storage Containers
Engineering Evaluation SS-EV-970012, Rev. 00, Fire Protection Evaluation Criteria for Permanent Combustible Storage Locations
Engineering Evaluation SS-EV-980005, Rev. 00, Fire Protection Evaluation of Through Bolting Material on Rated Block Walls
Engineering Evaluation EE-00003, Rev. 00, Fire Protection Evaluation, Long Term Storage of RCP Motor in Fuel Storage Building

Work Orders

WO 0214763
WO 0214880
WO 0214871

Calculations

9763-3-ED-00-23-F, Medium Voltage Protection Relay Coordination and Miscellaneous Relay Settings, Revision 4.
9763-3-ED-00-31-F, 480 V Breaker Coordination, Revision 2.

Procedures

OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 09
OS1200.01, Safe Shutdown and Cooldown from the Main Control Room, Revision 07
OS1200.02, Safe Shutdown and Cooldown from the Remote Safe Shutdown Facilities, Rev. 07
OS1200.00A, FHA for Affected Area/Zone - Appendix A, Revision 05
LX0558.01, 4160 V Breaker Inspection, Testing and PM, Revision 1.
LX0557.02, 60 Month PM of 480 V US Breakers, Revision 2.
OX1400.02, Remote Safe Shutdown System 18 Month Operability Check, Revision 6.

Corrective Action Program Documents

CR 02-11588, Procedure Logic and Human Factors Problem
CR-02-06487, Valve MS-PV-3003 Could Not Maintain in Open Position, May 6, 2002.
CR-02-07212, MS-PV-3003-04 (SOV) Failed, May 11, 2002.
CR-02-07328, Inadequate Retest Specified for MS-PV-3003.
CR 01-02407, Combustible Material Control Problems

Test Reports

Foreign Print 4225V, Fire Test Configuration for a Three-Hour Rated SF-60 Seal
Foreign Print 4214V, Fire Test Utilizing Bisco SF-60 Where Cable Trays Exist
Interam Fire Barrier - Heat Absorbing Mat Type E50A
FP-18382, ASTM E119-83 Standard Methods of Fire Tests of Building Construction and
Materials of Metal Siding Partition Wall Assembly

Miscellaneous Documents

DBD-FP-01, Design Basis Document (Appendix 'R' Emergency Lighting)