

**North
Atlantic**

North Atlantic Energy Service Corporation
P.O. Box 300
Seabrook, NH 03874
(603) 474-9521

The Northeast Utilities System

July 11, 1997

Docket No. 50-443
NYN-97082

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

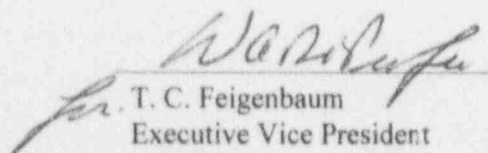
Seabrook Station
Diesel Generator Special Report

Enclosed is North Atlantic Energy Service Corporation's, (North Atlantic) report documenting the Emergency Diesel Generator (EDG) failures experienced during Seabrook Station's fifth refueling outage (OR05) inspection and maintenance activities. This report is submitted in accordance with Technical Specification Surveillance Requirement 4.8.1.1.3 and Technical Specification 6.8.2, Special Reports.

Should you have any additional questions regarding this response, please contact Mr. Terry L. Harpster, Director of Licensing Services, at (603) 773-7765.

Very truly yours,

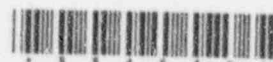
NORTH ATLANTIC ENERGY SERVICE CORP.



T. C. Feigenbaum
Executive Vice President
and Chief Nuclear Officer

cc: H. J. Miller, Regional Administrator
A. W. De Agezio, Sr. Project Manager
D. M. Silk, NRC Senior Resident Inspector

9707160141 970711
PDR ADOCK 05000443
S PDR



1/1
Tezz

DIESEL GENERATOR SPECIAL REPORT

Seabrook Station Emergency Diesel Generator 1A

The following Diesel Generator Special Report documents six start / load failures of Emergency Diesel Generator 1A (EDG-1A) during the period of June 13 to June 15, 1997. EDG inspection and maintenance activities are conducted at Seabrook Station at least once every 18 months as required by Technical Specification Surveillance Requirement 4.8.1.1.2f.1). This report is provided pursuant to Technical Specification Surveillance Requirement 4.8.1.1.3 and Technical Specification 6.8.2. The failures have been determined to be non-valid test failures. Seabrook Station Technical Specification 3/4.8.1.1 identifies Regulatory Guide 1.108, Revision 1, dated August 1977, "Periodic Testing of Diesel Generator Units Used as Onsite Electrical Power Systems at Nuclear Power Plants" as the basis for determining valid or non-valid test failures. At the time of the events described in this report the plant was in Mode 0 during Seabrook Station's fifth refueling outage, OR05. EDG-1A was inoperable between the period of May 30 and June 19, 1997, having been taken out of service for maintenance activities. EDG-1B, the opposite train Emergency Diesel Generator, was operable during this period.

EDG-1A TEST FAILURES

Non-valid Test Failure #1 June 13, 1997

EDG-1A was started to continue the on-going troubleshooting of the governor control system to investigate the inability of the electronic governor (EGA) to engage during an unloaded maintenance run the previous day. The engine was shutdown prior to loading because engine speed was being controlled at 62.5 Hz by the mechanical governor (EGB) with no speed control available. This was attributed to additional test leads of temporary instrumentation connected to the governor system causing mal-operation of the electronic governor. This failure is a non-valid test failure in accordance with Regulatory Guide 1.108 Section C.2.e.(7) because this was an on-going troubleshooting run to ascertain the scope of the problem associated with the governor control system. Also the manual engine shutdown is attributed to additional test leads of temporary instrumentation used in the troubleshooting activities. The additional test leads and temporary test instrumentation were inspected, reconfigured and adjusted.

Non-valid Test Failure #2 June 13, 1997

EDG-1A was started for an initial load run. This was the first run with load since EDG-1A was removed from service on May 30, 1997 to perform manufacturer recommended diesel generator general inspection and corrective maintenance activities which also included replacement of the mechanical governor (EGB) and the thermostatic control unit ("power pills") associated with lube oil temperature control valve, 1DG-V29A. This run was in support of observing general operation of the diesel generator and on-going maintenance troubleshooting activities associated with the electronic governor and temporary instrumentation installation. EDG-1A was started then loaded to 6000 kW. After running loaded for approximately 45 minutes, engine lube oil temperature was observed to be high at 162°F at which time an attempt to manually reduce load, remotely, was made. Remote operation to reduce load was unsuccessful. During the process of establishing local control to reduce load EDG-1A tripped on high lube oil temperature (trip setpoint: 167°F). The lube oil thermostatic temperature control valve 1DG-

V29A was subsequently dismantled with no obvious indications of malfunction observed, however, for prudence, the power pills associated with the valve were changed out.

The problem associated with loss of load control is not considered a failure, whether valid or non-valid, since it was associated with on-going troubleshooting activities of the governor that was being conducted under an approved maintenance plan as a troubleshooting activity. The tripping of EDG-1A on high lube oil temperature has been determined as a non-valid test failure since the maintenance plan specified a retest following replacement of the power pills during the major engine overhaul. Applying the guidance of Regulatory Guide 1.108 Sections C.2.e.(7), this failure is a non-valid test failure because the diesel was being run in a troubleshooting maintenance mode. The diesel run was not intended to establish final diesel operability. A refueling outage related maintenance plan prepared beforehand with subsequent scope changes in support of this troubleshooting specified the performance of a maintenance run to check diesel generator operation prior to the performance of an operability surveillance test. The operability surveillance test is the test performed to verify problem correction.

The cause of this failure was indeterminate as of June 13, 1997 since troubleshooting activities were still on-going.

Non-valid Test Failure #3 June 13, 1997

EDG-1A was started and loaded to continue troubleshooting activities. At approximately 2400 kW remote load reduction could not be accomplished. The engine was unloaded by overriding the governor via use of the load limit control knob and subsequently shutdown. An investigation discovered that the motor operated pot (MOP) failed to return to the detent position and the low speed auxiliary relay (LSRX) had a dirty contact. The MOP was replaced and the relay contacts were cleaned. Applying the guidance of Regulatory Guide 1.108 Section C.2.e.(7), this failure is a non-valid test failure because the diesel was being run in a troubleshooting maintenance mode to ascertain the scope of the problem associated with the governor control system. The diesel run was not intended to establish final diesel operability nor verify correction of the problems noted.

Non-valid Test Failure #4 June 14, 1997

Following MOP replacement and LSRX relay contact cleaning, EDG-1A was restarted and the MOP was adjusted to the correct frequency to 60 Hz. EDG-1A was subsequently loaded and varied up and down to monitor governor response. It was noted that loading appeared to be sluggish. At approximately 4400 kW remote load reduction could not be accomplished. EGA was putting out an output signal but it appeared that EGB was not responding. The engine was unloaded by overriding the governor via use of the local load limit control knob and then shutdown. Because of the early engine shutdown there was insufficient time to assess lube oil temperature response. The engine was subsequently restarted briefly to further assess the governor problems. A decision was made to swap out the mechanical governor based on the poor response. Applying the guidance of Regulatory Guide 1.108 Section C.2.e.(7), this failure is a non-valid test failure because the diesel was being run in a troubleshooting maintenance mode to ascertain the scope of the problem associated with the governor control system. The diesel run was not intended to establish final diesel operability nor verify correction of the problems noted.

Non-valid Test Failure #5 June 15, 1997

Following replacement of the mechanical governor (EGB), EDG-1A was started for adjustment of the mechanical governor stops and mechanical needle valve to control "hunting" and subsequently shutdown. Following the adjustments, EDG-1A was restarted and loaded / unloaded at various load ranges. It was noted that load was swinging between 3500 to 5000 kW and then began an uncontrolled load increase. At 6500 kW the engine was tripped to terminate the uncontrolled load increase. Applying the guidance of Regulatory Guide 1.108 Section C.2.e.(7), this failure is a non-valid test failure because the diesel was being run in a troubleshooting maintenance mode to ascertain the scope of the problem associated with the governor control system. The diesel run was not intended to establish final diesel operability nor verify correction of the problems noted.

Non-valid Test Failure #6 June 15, 1997

The engine was restarted to conduct further detailed testing to verify fuel pump performance, obtain engine balancing data for future adjustments, and observe operation of the governor and various input signals. No irregularities in operation were observed. Following this run, EDG-1A was restarted and tripped on overspeed at start. Review of test traces showed erratic / no output from the electronic governor (EGA) to the mechanical governor (EGB). Subsequent investigation found that two screws associated with the leads on EGA output were loose, most likely caused by the installation / removal of test equipment leads during maintenance and troubleshooting activities. Following tightening of the screws the engine was restarted and loaded / unloaded successfully. The overspeed trip is considered to be a non-valid test failure in accordance with guidance of Regulatory Guide 1.108 Section C.2.e.(7), because the diesel was being run in a troubleshooting maintenance mode to ascertain the scope of the problem associated with the governor control system. The diesel run was not intended to establish final diesel operability nor verify correction of the problems noted.

Subsequent EDG-1A Operation

Following the successful load run on June 15, 1997 several more maintenance runs were conducted with no test failures occurring. A successful 110% (approx. 6700 kW) load run on EDG-1A was performed on June 17, 1997. Following this run EDG-1A was declared "functionally available" (not operable). At 1656 hrs. June 17, 1997 EDG-1A was restarted for commencement of the 24 hour surveillance run. This run actually continued for approximately 40 hours, to avert any potential loss of power condition while the plant was at mid-loop condition. Following the completion of mid-loop activities, EDG-1A was shutdown and then restarted within 5 minutes under hot engine conditions. At 1806 hrs. June 19, 1997 EDG-1A was restarted for a four hour "operability run". Following paperwork closeout EDG-1A was declared OPERABLE at 0450 on June 20, 1997.

Required Test Interval Schedule

The failures reported have all been determined to be non-valid test failures. In accordance with Technical Specification Table 4.8.1, the number of failures in last 20 valid tests on a per diesel generator basis is ≤ 1 (actually 1 that occurred on 9/20/96), and the number of failures in the last 100 valid tests on a per diesel generator basis is ≤ 5 (actually 2, occurred 12/16/92 & 9/20/96). Therefore, a change in surveillance test frequency for EDG-1A is not warranted nor required.

Diesel Unavailability Time

The total time EDG-1A was "functionally unavailable" as a result of the scheduled maintenance outage and the subsequent troubleshooting and repairs was approximately four hundred thirty six (436) hours. The time EDG-1A was "functionally available" until declared OPERABLE was approximately sixty (60) hours.