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Ted C. Feigenbaum
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NYN-92143

October 16, 1992

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

References: Facility Operating License No. NPF-86, Docket No. 50-443

Subject: Licensee Event Report (LER) No. 92-019-00: Delta T/Tavg Protection Channel
Operational Test

Gentlemen:

Enclosed please find Licensee Event Report (LER) No. 92-019-00 for Seabrook Station. This submittal documents an event which was identified on September 16, 1992 and is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B).

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521, extension 3772.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Ted C. Feigenbaum".
Ted C. Feigenbaum

TCF:MJM/ss

Enclosure NRC Forms 366, 366A

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October 16, 1992
Page two

cc: Mr. Thomas T. Martin
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United States Nuclear Regulatory Commission
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) SEABROOK STATION										DOCKET NUMBER (2) 0 5 0 0 0 1 4 3										PAGE (3) 1 OF 0 4																																
TITLE (4) Delta T/Tavg Protection Channel Operational Test																																																				
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MONTH			DAY			YEAR			YEAR			SEQUENTIAL NUMBER			REVISION NUMBER			MONTH			DAY			YEAR			FACILITY NAMES										DOCKET NUMBER(S)															
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NAME Mr. James M. Peschel, Regulatory Compliance Manager, ext. 3772																				TELEPHONE NUMBER AREA CODE 6 1 0 3										4 7 4 1 - 1 9 5 1 2 1																						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																				
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X YES (If yes, complete EXPECTED SUBMISSION DATE)																				NO										EXPECTED SUBMISSION DATE (15)										MONTH DAY YEAR 1 2 1 6 9 2												

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On September 16, 1992, North Atlantic Energy Service Corporation (North Atlantic) determined that the existing method for performing the required Analog Channel Operational Test (ACOT) of the Loop Delta Temperature/Average Loop Temperature Protection Channels [JC] is not adequate. The NRA card, which converts the ohmic value from the reactor coolant system RTDs to a proportional voltage, in each of the four channels has not been included in the ACOTs. A simulated signal, using a decade box, is injected as close to the RTDs as practical as required by Technical Specifications. However, the decade box was adjusted to verify trip bistable setpoints were within tolerance without comparing the ohmic value of the decade box with the output voltage of the NRA card to ensure the NRA card drift was within an acceptable tolerance.

There are two Seabrook Station Technical Specifications which are affected by this event. Technical Specification Surveillance 4.3.1.1 requires, in part, that an Analog Channel Operational Test (ACOT) be performed on the Overtemperature ΔT reactor trip and the Overpower ΔT reactor trip at least once every quarter while in Modes 1 and 2 on a staggered test basis. Technical Specification Surveillance Requirement 4.3.2.1 requires, in part that an ACOT be performed on the feedwater isolation on low Tavg coincident with a reactor trip channels at least once per month while in Modes 1 and 2. Successful performance of specified surveillances demonstrates the OPERABILITY of the associated instrumentation, interlocks, and automatic trip logics.

North Atlantic is performing a thorough evaluation of this condition and will provide this information in a supplement to this report.

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TEXT (If more space is required, use additional NRC Form 3664's) (17)

DESCRIPTION OF EVENT

The narrow range Reactor Coolant System Hot leg and Cold leg Resistance Temperature Detectors (RTD) are used in the loop delta temperature (ΔT) and average loop temperature (Tavg) channels. These parameters are used in the Overtemperature ΔT and Overpower ΔT reactor trips. There are four channels of ΔT and Tavg, one for each loop, with protective action occurring when at least two of the four channels indicate a ΔT or Tavg value which exceeds their setpoint.

There are two Seabrook Station Technical Specifications which are affected by this event. Technical Specification Surveillance 4.3.1.1 requires, in part, that a channel calibration be performed on the Overtemperature ΔT reactor trip and the Overpower ΔT reactor trip at least once every 18 months, with an Analog Channel Operational Test (ACOT) performed at least once per quarter on a staggered test basis while in Modes 1 and 2. Technical Specification Surveillance Requirement 4.3.2.1 requires, in part that a channel calibration be performed of the feedwater isolation on low Tavg coincident with a reactor trip channel at least once every 18 months, with an ACOT performed at least once per month while in Modes 1 and 2. Successful performance of specified surveillances demonstrates the OPERABILITY of the associated instrumentation, interlocks, and automatic trip logics.

On September 16, 1992 North Atlantic personnel determined that the Station Procedures for performing the ACOTs on the ΔT /Tavg Protection Channels did not test the complete loop. The Technical Specification definition of an Analog Channel Operational Test is as follows:

An ANALOG CHANNEL OPERATIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY of alarm, interlock and/or trip functions. The ANALOG CHANNEL OPERATIONAL TEST shall include adjustments, as necessary, of the alarm, interlock and/or Trip Setpoints such that the Setpoints are within the required range and accuracy.

The Station Procedures did in fact direct the signal injection (i.e., a decade box) to be at a point which was as close to the sensor as practicable. However, the data reference point was at the output of the NRA cards (the circuits which convert the resistance values of the Reactor Coolant System RTDs to a proportional voltage) instead of at the input. The decade box was adjusted to yield the desired output voltage as measured by a digital voltmeter at the output of the NRA card. The ohm value of the decade box was not considered or recorded. Thus, while the channels were verified to operate properly with a simulated voltage as measured at the output of the NRA card, the ACOT method used did not verify that the NRA card accurately produced a representative voltage for a simulated resistance. Channel calibrations of the ΔT /Tavg protection channels included the NRA cards.

Since the NRA cards were not tested as part of the monthly operational test of the ΔT /Tavg Protection Channels, an ACOT as defined in the Technical

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SEABROOK STATION

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EXT. IF NRC FORM 366A IS REQUIRED, USE ADDITIONAL NRC FORM 366A-2 (1/77)

Specifications was not fully accomplished. Since the plant has been operating without portions of Technical Specification Surveillance Requirements 4.3.1.1 and 4.3.2.1 being fully accomplished, this condition is being reported in accordance with 10 CFR 50.73(a)(2); (b) as operation prohibited by the plant's Technical Specifications.

SAFETY CONSEQUENCES

The engineering evaluation of the safety consequences for $\Delta T/T_{avg}$ protection channels is continuing. Calibration of the $\Delta T/T_{avg}$ channels is required by Technical Specifications to be performed at least once every 18 months, with ACOTs performed in between calibrations to verify channel operability. However, because the ACOTs were not performed, the operability of the $\Delta T/T_{avg}$ channels was not demonstrated as required by Technical Specifications. The required calibrations were fully performed, including verification that NRA cards were within their specified tolerance. Maintenance history records were reviewed to identify all calibrations which were performed on the four $\Delta T/T_{avg}$ protection channels. This included calibrations scheduled during refueling outages to meet the 18 month criteria specified by Technical Specifications and calibrations performed as a retest for work requests which investigated indications that a channel may have drifted outside its calibration tolerance (e.g. a deviation alarm or a Main Control Board indication on one channel which was different than the other three). Evaluation of the data from calibrations to determine whether the channel would have exceeded its analysis value is continuing. Preliminary reviews indicate that sufficient margin existed in the setpoint uncertainty calculation to account for the drift of the instrumentation which was observed when the calibration was performed. North Atlantic has performed a channel calibration on all of the $\Delta T/T_{avg}$ protection channels and revised Station Procedures IX1662.420, IX1662.421, IX1662.422, and IX1662.423, "Delta T/Tavg Protection Channel Operational Test", to require verification that the NRA cards are within the required tolerance in future ACOTs.

ROOT CAUSE

The root cause of this condition has not yet been determined. North Atlantic is performing a thorough evaluation of this condition and will provide this information in a supplement to this report.

CORRECTIVE ACTIONS

Station Procedures IX1662.420, IX1662.421, IX1662.422, and IX1662.423, "Delta T/Tavg Protection Channel Operational Test", have been revised to require comparing the specified simulated resistance value generated by the decade box with the output voltage of the NRA card and verifying that the output voltage is within the required tolerance. These procedures are available for review at Seabrook Station. Additional corrective actions identified during the ongoing evaluation of this condition will be included in a supplement to this report. It is expected that this report will be submitted to the NRC by December 16, 1992.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/95

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TEXT (If more space is required, use additional NRC Form 366A (1/17))

PLANT CONDITIONS

The plant was in Mode 6, with a reactor coolant system temperature of 105°F and with pressure at 0 psig. However, the condition identified in this report existed during previous full power operation.

North Atlantic has reported other instances where instrumentation required by plant Technical Specifications was not adequately tested in Licensee Event Reports 92-004-00, 92-008-00, and 92-009-00.