North Atlantic

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The Northeast Utilities System

December 21, 2001

Docket No. 50-443

NYN-01105

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Seabrook Station
License Amendment Request 01-07
"Changes To Certain Technical Specifications Associated With Response Time Testing"

North Atlantic Energy Service Corporation (North Atlantic) has enclosed herein License Amendment Request (LAR) 01-07. License Amendment Request 01-07 is submitted pursuant to the requirements of 10 CFR 50.90 and 10 CFR 50.4.

LAR 01-07 proposes changes to the Seabrook Station Technical Specifications (TS) 3/4.3.1, "Reactor Trip System Instrumentation," and TS 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and the associated Bases. The proposed changes will revise TS Surveillance Requirements (SR) 4.3.1.2 and 4.3.2.2 to allow verification in lieu of demonstration (i.e., measurement/testing) of response time associated with certain pressure sensors, differential pressure sensors, Process Protection racks, Nuclear Instrumentation, and Logic Systems. The proposal is in accordance with the basis and methodologies outlined in WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," and WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests."

The Station Operation Review Committee and the Nuclear Safety Audit Review Committee have reviewed LAR 01-07.

As discussed in the enclosed LAR Section IV, the proposed change does not involve a significant hazard consideration pursuant to 10 CFR 50.92. A copy of this letter and the enclosed LAR has been forwarded to the New Hampshire State Liaison Officer pursuant to 10 CFR 50.91(b). North Atlantic requests NRC Staff review of LAR 01-07, and issuance of a license amendment by March 30, 2002 (see Section V enclosed).

A001

Rec'd 01/23/02

North Atlantic has determined that LAR 01-07 meets the criterion of 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement (see Section VI enclosed).

Should you have any questions regarding this letter, please contact Mr. James M. Peschel, Manager - Regulatory Programs, at (603) 773-7194.

Very truly yours,
NORTH ATLANTIC ENERGY SERVICE CORP.

Joe M. Vargas
Director - Engineering

cc: H. J. Miller, NRC Region I Administrator
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North Atlantic

SEABROOK STATION UNIT 1

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

License Amendment Request 01-07,
"Changes To Certain Technical Specifications Associated With Response Time Testing"

This License Amendment Request is submitted by North Atlantic Energy Service Corporation pursuant to 10CFR50.90. The following information is enclosed in support of this License Amendment Request:

- Section I - Introduction and Safety Assessment for Proposed Changes
- Section II - Markup of Proposed Changes
- Section III - Retype of Proposed Changes
- Section IV - Determination of Significant Hazards for Proposed Changes
- Section V - Proposed Schedule for License Amendment Issuance And Effectiveness
- Section VI - Environmental Impact Assessment

I, Joe M. Vargas, Director - Engineering of North Atlantic Energy Service Corporation hereby affirm that the information and statements contained within this License Amendment Request are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Joe M. Vargas
Director - Engineering

Sworn and Subscribed
before me this
21st day of December, 2001

Marilyn R. Sullivan
Notary Public

SECTION I

INTRODUCTION AND SAFETY ASSESSMENT FOR PROPOSED CHANGES

I. INTRODUCTION AND SAFETY ASSESSMENT OF PROPOSED CHANGES

A. Introduction and Description of Change

License Amendment Request (LAR) 01-07 propose changes to the Seabrook Station Technical Specifications (TS) 3/4.3.1, "Reactor Trip System Instrumentation," and TS 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and the associated Bases. The proposed changes will revise TS Surveillance Requirements (SR) 4.3.1.2 and 4.3.2.2 to allow verification in lieu of demonstration (i.e., measurement/testing) of response time associated with certain pressure sensors, differential pressure sensors, Process Protection racks, Nuclear Instrumentation, and Logic Systems. The proposal is in accordance with the basis and methodologies outlined in WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" (Reference 1), and WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" (Reference 2).

Specifically, the proposed changes to SR 4.3.1.2 and 4.3.2.2 will replace the words "demonstrated," "testing" and "tested" with the words "verified" and "verification." The basis for the proposed changes will be incorporated into Bases Sections B 3/4.3.1 and B 3/4.3.2.

The TS changes proposed herein would afford North Atlantic operational flexibility by eliminating the periodic requirement for response time testing (RTT) of certain components and systems. North Atlantic estimates an average of 381 workhours savings each refueling outage by eliminating the periodic requirement for RTT of certain components and systems. In addition, elimination for periodic RTT of certain components and systems provides additional benefits such as: 1) decreasing the possibility of inadvertent engineering safety features actuations and plant trips thus plant safety is improved, 2) increasing the availability of equipment because components are no longer removed from service for testing, and 3) decreasing radiation exposure to technicians who must access transmitters in radiation fields.

The TS Bases associated with the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) Instrumentation states "Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined." Given this guidance and the complexity of testing an entire instrument channel from the sensor to the final device, plant surveillance procedures typically test a channel in several segments. Three segments in most plant test methodologies are the instrument sensor, the process rack and the trip logic. Separate procedures using specialized test equipment are typically used for testing within these segments.

During the review of Reference 2, the NRC staff raised several questions which the Westinghouse Owners Group (WOG) responded to. As part of this response, the following statement was subsequently added to the NUREG-1431 definitions of "Reactor Trip System Response Time" and "Engineered Safety Features (ESF) Response Time:"

> "In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC."

The above statement has already been incorporated in North Atlantic's recent LAR 01-05 submittal (Reference 3). Therefore, to eliminate redundancy, this statement will not be part of this LAR.

B. Evaluation of Proposed Changes

The proposed changes will eliminate the periodic requirement to physically measure RTS and ESFAS channel response times and allow response times to be verified by summing allocated times for certain sensors, the process protection system, the nuclear instrumentation system, and the logic system. For those devices where RTT will continue to be performed, the measurements will be verified against the acceptance criteria determined by North Atlantic to ensure the response times remain within safety analysis limits.

Justification for the proposed TS changes is addressed herein in two parts: (1) to eliminate certain pressure sensor RTT in accordance with Reference 1, and (2) to eliminate certain protection channel RTT in accordance with Reference 2.

WCAP-13632-P-A, Revision 2 (Reference 1)

Reference 1 provides the technical justification for deletion of periodic response time testing of selected pressure sensing instruments. The program described in Reference 1, utilizes the methods contained in EPRI Report NP-7243, Revision 1, "Investigation of Response Time Testing Requirements," for justifying elimination of periodic response time testing surveillance requirements on certain pressure and differential pressure sensors. The EPRI report justifies the elimination of periodic response time testing based on Failure Modes and Effects Analysis (FMEA) that show that component degradation that impacts pressure sensor response time will be detected in other routine tests such as calibration tests. The report concludes that sensor RTT is redundant to other technical specification surveillance requirements such as sensor calibrations. The EPRI report only applies to those specific sensors included in the FMEA.

To address other sensors installed in Westinghouse designed plants, Westinghouse performed a similarity analysis to sensors in EPRI Report NP-7243, Revision 1, or a FMEA to provide justification for elimination of periodic response time testing requirements for those sensors not addressed in the EPRI report.

The sensors currently installed at Seabrook Station are:

- Rosemount 1153DB — Emergency Feedwater Flow
- Rosemount 1153GB — Steamline Pressure
- Rosemount 1154DP — Steam Generator Water Level
- Rosemount 1154GP — Pressurizer Pressure
- Tobar 32DP2 — Reactor Coolant Flow
- Tobar 32PA2 — Steamline Pressure
- Westinghouse Barton 752 — Containment Pressure
- Westinghouse Veritrak 76DP1 — Reactor Coolant Flow
- Westinghouse Veritrak 76PG1 — Steamline Pressure

The basis for eliminating periodic response time testing for each sensor is discussed in Reference 1 and/or EPRI Report NP-7243, Revision 1. These reports provide justification that any sensor failure that significantly degrades response time will be detectable during surveillance testing such as calibration and channel checks.

Reference 1 states that the response time to be allocated in place of response times obtained through actual measurement during the period of verification may be obtained from:

(1) Historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests),

(2) In-place, onsite, or offsite (e.g., vendor) test measurements, or

(3) Utilizing vendor engineering specifications.

North Atlantic intends to adopt the conservative Westinghouse Equipment Specification response time values listed in Table 9-1 of Reference 1 for applicable transmitters installed. However, for Rosemount 1153DB, 1153GB, 1154DP, and 1154GP transmitters not evaluated by Reference 1, North Atlantic will use response times based on actual transmitter performance. For channel response time calculations, conservative values of 0.200 sec. for DB, GB and GP units; and 0.600 sec. for DP units have been applied.

EPRI Report NP-7243, Revision 1 provides recommendations for modifying the RTT program for pressure and differential pressure sensors. The EPRI recommendations will be adopted at Seabrook Station through applicable plant procedure revisions. The following exceptions/limitations will be incorporated into applicable plant documentation:

(a) A hydraulic response time test must be performed prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value;

(b) For transmitters and switches that use capillary tubes, a response time test must be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes;

(c) If variable damping is used*, a method to assure that the potentiometer is at the required setting and cannot be inadvertently changed must be implemented, or a

* Seabrook Station currently has no pressure transmitters with variable damping installed in any RPS or ESFAS application for which RTT is required; therefore, no Seabrook Station procedure changes or enhanced administrative controls are required. If in the future, a pressure transmitter with variable damping capability is used, then North Atlantic will implement procedure changes and/or establish appropriate administrative controls to assure the variable damping potentiometer cannot be inadvertently changed. Examples of such administrative controls may include use of pressure transmitters that are factory set and hermetically sealed to prohibit tampering or in situ application of a tamper seal (or sealant) on the potentiometer to secure and give a visual indication of the potentiometer position.

hydraulic response time test of the sensor must be performed following each calibration; and

(d) Perform periodic drift monitoring for Model 1151, 1152, 1153 and 1154 Rosemount pressure and differential pressure transmitters, for which response time testing elimination is implemented, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4 and continue to remain in full compliance with any prior commitments to NRC Bulletin 90-01, Supplement 1, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount."

Seabrook Station may complete the following actions as an alternative to performing periodic drift monitoring of Rosemount transmitters:

(1) Assure that operators and technicians are aware of the Rosemount transmitter loss of fill-oil issue and make provisions to assure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters; and

(2) Review and revise surveillance testing procedures, if necessary, to assure that calibrations will be performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

With respect to item (d), North Atlantic is currently performing drift monitoring for Model 1153 and 1154 Rosemount pressure and differential pressure transmitters in accordance with the guidance contained in Rosemount Technical Bulletin No. 4 and North Atlantic is in full compliance with any prior commitments to NRC Bulletin 90-01, Supplement 1. Currently no Model 1151 and 1152 Rosemount pressure and differential pressure transmitters are installed at Seabrook Station. However, North Atlantic is considering sub-items (1) and (2) and may implement them at a future date.

In consideration of other response time test procedures used at Seabrook Station the Resistance Temperature Detectors (RTDs) are not encompassed by this analysis as presented and will continue to be periodically tested.

WCAP-14036-P-A, Revision 1 (Reference 2)

Reference 2 provides the technical justification for deletion of periodic response time testing of signal conditioning and logic equipment. The program described in Reference 2 is based upon a FMEA to provide justification for elimination of periodic response time testing requirements for systems utilized in the derivation of a reactor trip or safeguards actuation function from the sensor output up to the input of the final device (breaker, valve, etc.). The WOG supplemented the FMEA by actual testing of system cards with a simulation of degraded components in selected areas to provide validation of the failure analysis and to document baseline response times. For functions that use several cards, the total time was obtained by summing the response time of each card. For relays, manufacturer response time information was used. Based on the analysis performed, bounding generic rack response time allocations applicable to the protection functions were generated. These bounding response times were combined in the most limiting protection function string for each group of protection functions. Additional margin was included for each group. The result of this work is tabulated in Table 8-1 of Reference 2.

The FMEA presented in WCAP-14036-P-A, Revision 2, is applicable to the following Seabrook Station systems:

- Process Protection System — Westinghouse / 7300
- Nuclear Instrumentation System — Westinghouse / Nuclear Instrumentation System (NIS)
- Logic System — Westinghouse / Solid State Protection System (SSPS)

The justification basis for eliminating periodic response time testing for these systems, as discussed in Reference 2, is as follows:

(1) That any failure that significantly degrades response time will be detectable during surveillance testing such as calibration and channel checks, or

(2) The total response time allocation will be modified to include an allowance for those failures that are not specifically detectable by these tests.

North Atlantic has confirmed that the FMEA presented in Reference 2 is applicable to and valid for the equipment actually installed at Seabrook Station. Furthermore, North Atlantic has determined that with the use of the generic response times, the overall plant-specific system response times remain within the Seabrook Station safety analysis limits. Therefore, the TSs are being revised to indicate that the system response time shall be verified utilizing system response times justified by the methodology described in Reference 2. North Atlantic will use allocations for system response times either from the bounding criteria in Reference 2 or from the summation of individual components within a specific channel, as appropriate. Seabrook Station response time allocations are delineated in Table I.B-1 for the RTS and in Table I.B-2 for the ESFAS. The following is a description of Seabrook Station specific exceptions to the presentation of response times as sequenced in Reference 2:

1. Existing response time test methods proceduralized at Seabrook Station were taken into account when evaluating time lines for each function. In existing Seabrook Station procedures, the final actuated device response time includes the master and slave relays of the SSPS. Since response times of the final actuated devices are not exempted from response time tests, these components of the SSPS will continue to be tested along with their applicable final actuated equipment, thus North Atlantic has chosen not to apply the total analyzed response time for the SSPS. For the SSPS portion of the protection functions, North Atlantic has applied only the analyzed FMEA value for the input relay and a conservative value (with respect to Reference 2) for the SSPS logic.

2. In consideration of other response time test procedures used at Seabrook Station the following functions are not encompassed by this analysis as presented and will continue to be periodically tested. These functions are:

   - Reactor Trip on Reactor Coolant Pump Undervoltage,
   - Reactor Trip on Reactor Coolant Pump Underfrequency,
   - Diesel Generator Start on Loss of Offsite Power, and
   - Control Building Air Emergency Fan/Filter Actuation on Control Room High Radiation.

C. Safety Assessment Conclusion of Proposed Changes

North Atlantic concludes that based upon the above discussion, as well as the "Determination of Significant Hazards for Proposed Changes," presented in Section IV, that the proposed changes do not adversely affect or endanger the health or safety of the general public or involve a significant safety hazard.

D. References

1. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

2. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," October 6, 1998.

3. North Atlantic Letter NYN-01050, License Amendment Request 01-05, "Administrative Changes To The Technical Specification Definitions," August 6, 2001.

TABLE I.B-1

Reactor Trip System (RTS) Response Time Allocations

RTS Function	Sensor (Sec.)	7300 Process Cabinet (Sec.)	Input Relay / Logic (Sec.) (Note 1)
NIS PR High & Low SP	(Note 2)	0.065 (Note 3)	0.020 / 0.01
NIS PR High Positive Rate	(Note 2)	0.300 (Note 4)	0.020 / 0.01
NIS PR High Negative Rate	(Note 2)	0.200 (Note 3)	0.020 / 0.01
OTΔT, OPΔT / T_{avg}	(Note 5)	0.400	0.020 / 0.01
Pressurizer Pressure Low & High	0.200	0.100	0.020 / 0.01
Reactor Coolant Flow Low	0.400	0.100	0.020 / 0.01
S/G Level Low-Low	0.200	0.100	0.020 / 0.01
RCP Undervoltage	(Note 6)	---	---
RCP Underfrequency	(Note 6)	---	---

Notes:

1. For the Input Relays, the response time allocation is 0.020 sec. for normally energized relays.

2. Nuclear Instrumentation detectors are not response time tested.

3. Westinghouse Nuclear Instrumentation Cabinet time allocation from WCAP-14036-P-A, Revision 1 (Reference 2).

4. Westinghouse Nuclear Instrumentation Cabinet time allocation from Seabrook Station Plant Data.

5. Periodic response time testing of the Resistance Temperature Detectors (RTDs) will continue.

6. Periodic response time testing of these functions will continue.

TABLE I.B-2

Engineered Safety Features Actuation System (ESFAS) Response Time Allocations

ESFAS Function	Sensor (Sec.)	7300 Process Cabinet (Sec.)	Input Relay / Logic (Sec.) (Note 1)
Containment Pressure HI-1	0.400	0.100	0.020 / 0.01
Pressurizer Pressure Low	0.200	0.100	0.020 / 0.01
Steam Pressure Low	0.200	0.100	0.020 / 0.01
Containment Pressure HI-3	0.400	0.100	0.026 / 0.01
Containment Pressure HI-2	0.400	0.100	0.020 / 0.01
Steam Line Hi Negative Rate	0.400	0.100	0.020 / 0.01
S/G Level HI-HI	0.200	0.100	0.020 / 0.01
S/G Level Low-Low	0.200	0.100	0.020 / 0.01
Emergency Feedwater Flow	0.200	0.100	0.020 / 0.01
RWST Level Low-Low	0.400	0.100	0.026 / 0.01
LOP Diesel Generator Start	(Note 2)	---	---
CBA Actuation on Control Room HI Radiation	(Note 2)	---	---

Notes:

1. For the Input Relays, the response time allocation is 0.020 sec. for normally energized relays, and 0.026 sec. for normally de-energized relays.

2. Periodic response time testing of these functions will continue.

SECTION II

MARKUP OF PROPOSED CHANGES

Refer to the attached markup of the proposed changes to the Technical Specifications. The attached markup reflects the currently issued revision of the Technical Specifications listed below. Pending Technical Specifications or Technical Specification changes issued subsequent to this submittal are not reflected in the enclosed markup.

The following Technical Specification changes are included in the attached markup:

Technical Specification	Title	Page
3/4.3.1	Reactor Trip System Instrumentation	3/4 3-1
3/4.3.1	Engineered Safety Features Actuation System Instrumentation	3/4 3-15
Bases 3/4.3.1 and 3/4.3.2	Reactor Trip System and Engineered Safety Features Actuation System Instrumentation	B 3/4 3-2

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each Reactor Trip System instrumentation channel and interlock and the automatic trip logic shall be demonstrated OPERABLE by the performance of the Reactor Trip System Instrumentation Surveillance Requirements specified in Table 4.3-1.

4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each Reactor trip function shall be ~~demonstrated~~ to be within its limit at least once per 18 months. Each ~~test~~ shall include at least one train such that both trains are ~~tested~~ at least once per 36 months and one channel per function such that all channels are ~~tested~~ at least once every N times 18 months where N is the total number of redundant channels in a specific Reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

verified

verification

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by performance of the ESFAS Instrumentation Surveillance Requirements specified in Table 4.3-2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be ~~demonstrated~~ verified to be within the limit at least once per 18 months. Each ~~test~~ verification shall include at least one train such that both trains are ~~tested~~ verified at least once per 36 months and one channel per function such that all channels are ~~tested~~ verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (Continued)

uncertainties of the instrumentation to measure the process variable and the uncertainties in calibrating the instrumentation. In Equation 2.2-1, $Z + R\ S \leq TA$, the interactive effects of the errors in the rack and the sensor, and the "as measured" values of the errors are considered. Z, as specified in Table 3.3-4, in percent span, is the statistical summation of errors assumed in the analysis excluding those associated with the sensor and rack drift and the accuracy of their measurement. TA or Total Allowance is the difference, in percent span; R or Rack Error is the "as measured" deviation, in the percent span, for the affected channel from the specified Trip Setpoint. S or Sensor Error is either the "as measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-4, in percent span, from the analysis assumptions. Use of Equation 2.2-1 allows for a sensor drift factor, an increased rack drift factor, and provides a threshold value for REPORTABLE EVENTS.

The methodology to derive the Trip Setpoints is based upon combining all of the uncertainties in the channels. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensor and rack instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes. Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

~~The measurement of response time at the specified frequencies provides assurance that the Reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response time.~~

At the end of the injection phase of a LOCA, the RWST will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sumps. The low head residual heat removal (RHR) pumps and containment spray pumps draw the water from the containment recirculation sumps, the RHR pumps pump the water through the RHR heat exchangers, inject the water back into the RCS, and upon manual alignment supply the cooled water to the other ECCS pumps. Switchover from the RWST to

INSERT 4

INSERT A
(Sheet 1 of 4)

The verification of response time at the specified frequencies provides assurance that the reactor trip and the engineered safety features actuation associated with each channel is completed within the time limit assumed in the safety analysis. No credit is taken in the analysis for those channels with response times indicated as not applicable (i.e., N.A.).

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from:

(1) Historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests);

(2) Inplace, onsite, or offsite (e.g., vendor) test measurements; or

(3) Utilizing vendor engineering specifications.

WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in WCAP-13632-P-A, Revision 2. Response time verification for other sensor types not covered by WCAP-13632-P-A, Revision 2, must be demonstrated by test.

In consideration of other response time test procedures used at Seabrook Station the Resistance Temperature Detectors (RTDs) are not encompassed by this analysis as presented and will continue to be periodically tested.

For those sensors covered by WCAP-13632-P-A, Revision 2, the following actions must be implemented:

(a) A hydraulic response time test must be performed prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value;

(b) For transmitters and switches that use capillary tubes, a response time test must be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes;

INSERT A
(Sheet 2 of 4)

(c) If variable damping is used*, a method to assure that the potentiometer is at the required setting and cannot be inadvertently changed must be implemented, or a hydraulic response time test of the sensor must be performed following each calibration; and

(d) Performing periodic drift monitoring for Model 1151, 1152, 1153 and 1154 Rosemount pressure and differential pressure transmitters, for which response time testing elimination is implemented, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4 and continue to remain in full compliance with any prior commitments to NRC Bulletin 90-01, Supplement 1, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount." Seabrook Station may complete the following actions as an alternative to performing periodic drift monitoring of Rosemount transmitters:

(1) Assure that operators and technicians are aware of the Rosemount transmitter loss of fill-oil issue and will make provisions to assure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters; and

(2) Review and revise surveillance testing procedures, if necessary, to assure that calibrations will be performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time.

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* Seabrook Station currently has no pressure transmitters with variable damping installed in any RPS or ESFAS application for which RTT is required; therefore, no Seabrook Station procedure changes or enhanced administrative controls are required. If in the future, a pressure transmitter with variable damping capability is used, then either procedure changes will be implemented and/or appropriate administrative controls will be established to assure the variable damping potentiometer cannot be inadvertently changed. Examples of such administrative controls may include use of pressure transmitters that are factory set and hermetically sealed to prohibit tampering or in situ application of a tamper seal (or sealant) on the potentiometer to secure and give a visual indication of the potentiometer position.

INSERT A
(Sheet 3 of 4)

Table 8-1 of WCAP-14036-P-A, Revision 1, presents bounding generic system response time allocations. These bounding response times were used in the response times evaluated for each protection function at Seabrook Station. Current response time testing procedures require dividing the Solid State Protection System (SSPS) response times instead of applying the SSPS response time as a total string value. Future procedure changes may negate this redistribution if overall channel response time conforms to the WCAP-14036-P-A, Revision 1 methodology and remains compliant with accident analysis. The following current exceptions to WCAP-14036-P-A, Revision 1 time allocations apply to Seabrook Station:

1. Seabrook Station procedures include the master and slave relays of the SSPS when response time testing the final actuated device. Since response times of the final actuated devices are not exempted from response time tests, these components of the SSPS will continue to be tested along with their applicable final actuated equipment. For the SSPS portion of the protection functions, only the analyzed FMEA value for the input relay and a conservative value for the SSPS logic has been applied.

2. In consideration of other response time test procedures used at Seabrook the following functions are not encompassed by this analysis as presented in WCAP-14036-P-A, Revision 1 and will continue to be periodically tested. These functions are:

   - Reactor Trip on Reactor Coolant Pump Undervoltage
   - Reactor Trip on Reactor Coolant Pump Underfrequency
   - Diesel Generator Start on Loss of Offsite Power
   - Control Building Air Emergency Fan/Filter Actuation on Control Room High Radiation

The allocations for sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in WCAP-14036-P-A, Revision 1 may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

INSERT A
(Sheet 4 of 4)

The Seabrook Station sensor functions to which the basis and methodology of WCAP-13632-P-A, Revision 2 has been applied are:

- Steam Generator Water Level
- Pressurizer Pressure
- Steamline Pressure
- Containment Pressure
- Reactor Coolant Flow
- Emergency Feedwater Flow

The Seabrook Station systems to which the basis and methodology of WCAP-14036-P-A, Revision 1 has been applied are:

- Process Protection System
- Nuclear Instrumentation System
- Logic System

SECTION III

RETYPE OF PROPOSED CHANGES

Refer to the attached retype of the proposed changes to the Technical Specifications. The attached retype reflects the currently issued version of the Technical Specifications. Pending Technical Specification changes or Technical Specification changes issued subsequent to this submittal are not reflected in the enclosed retype. The enclosed retype should be checked for continuity with Technical Specifications prior to issuance.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each Reactor Trip System instrumentation channel and interlock and the automatic trip logic shall be demonstrated OPERABLE by the performance of the Reactor Trip System Instrumentation Surveillance Requirements specified in Table 4.3-1.

4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each Reactor trip function shall be verified to be within its limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific Reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by the performance of the ESFAS Instrumentation Surveillance Requirements specified in Table 4.3-2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

uncertainties of the instrumentation to measure the process variable and the uncertainties in calibrating the instrumentation. In Equation 2.2-1, $Z + R\ S \leq TA$, the interactive effects of the errors in the rack and the sensor, and the "as measured" values of the errors are considered. Z, as specified in Table 3.3-4, in percent span, is the statistical summation of errors assumed in the analysis excluding those associated with the sensor and rack drift and the accuracy of their measurement. TA or Total Allowance is the difference, in percent span; R or Rack Error is the "as measured" deviation, in the percent span, for the affected channel from the specified Trip Setpoint. S or Sensor Error is either the "as measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-4, in percent span, from the analysis assumptions. Use of Equation 2.2-1 allows for a sensor drift factor, an increased rack drift factor, and provides a threshold value for REPORTABLE EVENTS.

The methodology to derive the Trip Setpoints is based upon combining all of the uncertainties in the channels. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensor and rack instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes. Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

The verification of response time at the specified frequencies provides assurance that the reactor trip and the engineered safety features actuation associated with each channel is completed within the time limit assumed in the safety analysis. No credit is taken in the analysis for those channels with response times indicated as not applicable (i.e., N.A.).

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from:

(1) Historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests);

(2) Inplace, onsite, or offsite (e.g., vendor) test measurements; or

(3) Utilizing vendor engineering specifications.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in WCAP-13632-P-A, Revision 2. Response time verification for other sensor types not covered by WCAP-13632-P-A, Revision 2, must be demonstrated by test.

In consideration of other response time test procedures used at Seabrook Station the Resistance Temperature Detectors (RTDs) are not encompassed by this analysis as presented and will continue to be periodically tested.

For those sensors covered by WCAP-13632-P-A, Revision 2, the following actions must be implemented:

(a) A hydraulic response time test must be performed prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value;

(b) For transmitters and switches that use capillary tubes, a response time test must be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes;

(c) If variable damping is used*, a method to assure that the potentiometer is at the required setting and cannot be inadvertently changed must be implemented, or a hydraulic response time test of the sensor must be performed following each calibration; and

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* Seabrook Station currently has no pressure transmitters with variable damping installed in any RPS or ESFAS application for which RTT is required; therefore, no Seabrook Station procedure changes or enhanced administrative controls are required. If in the future, a pressure transmitter with variable damping capability is used, then either procedure changes will be implemented and/or appropriate administrative controls will be established to assure the variable damping potentiometer cannot be inadvertently changed. Examples of such administrative controls may include use of pressure transmitters that are factory set and hermetically sealed to prohibit tampering or in situ application of a tamper seal (or sealant) on the potentiometer to secure and give a visual indication of the potentiometer position.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

(d) Performing periodic drift monitoring for Model 1151, 1152, 1153 and 1154 Rosemount pressure and differential pressure transmitters, for which response time testing elimination is implemented, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4 and continue to remain in full compliance with any prior commitments to NRC Bulletin 90-01, Supplement 1, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount." Seabrook Station may complete the following actions as an alternative to performing periodic drift monitoring of Rosemount transmitters:

(1) Assure that operators and technicians are aware of the Rosemount transmitter loss of fill-oil issue and will make provisions to assure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters; and

(2) Review and revise surveillance testing procedures, if necessary, to assure that calibrations will be performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time.

Table 8-1 of WCAP-14036-P-A, Revision 1, presents bounding generic system response time allocations. These bounding response times were used in the response times evaluated for each protection function at Seabrook Station. Current response time testing procedures require dividing the Solid State Protection System (SSPS) response times instead of applying the SSPS response time as a total string value. Future procedure changes may negate this redistribution if overall channel response time conforms to the WCAP-14036-P-A, Revision 1 methodology and remains compliant with accident analysis. The following current exceptions to WCAP-14036-P-A, Revision 1 time allocations apply to Seabrook Station:

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

1. Seabrook Station procedures include the master and slave relays of the SSPS when response time testing the final actuated device. Since response times of the final actuated devices are not exempted from response time tests, these components of the SSPS will continue to be tested along with their applicable final actuated equipment. For the SSPS portion of the protection functions, only the analyzed FMEA value for the input relay and a conservative value for the SSPS logic has been applied.

2. In consideration of other response time test procedures used at Seabrook the following functions are not encompassed by this analysis as presented in WCAP-14036-P-A, Revision 1 and will continue to be periodically tested. These functions are:

   - Reactor Trip on Reactor Coolant Pump Undervoltage
   - Reactor Trip on Reactor Coolant Pump Underfrequency
   - Diesel Generator Start on Loss of Offsite Power
   - Control Building Air Emergency Fan/Filter Actuation on Control Room High Radiation

The allocations for sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in WCAP-14036-P-A, Revision 1 may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

The Seabrook Station sensor functions to which the basis and methodology of WCAP-13632-P-A, Revision 2 has been applied are:

- Steam Generator Water Level
- Pressurizer Pressure
- Steamline Pressure
- Containment Pressure
- Reactor Coolant Flow

The Seabrook Station systems to which the basis and methodology of WCAP-14036-P-A, Revision 1 has been applied are:

- Process Protection System
- Nuclear Instrumentation System
- Logic System

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

At the end of the injection phase of a LOCA, the RWST will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sumps. The low head residual heat removal (RHR) pumps and containment spray pumps draw the water from the containment recirculation sumps, the RHR pumps pump the water through the RHR heat exchangers, inject the water back into the RCS, and upon manual alignment supply the cooled water to the other ECCS pumps. Switchover from the RWST to the containment recirculation sumps must occur before the RWST empties to prevent damage to the ECCS pumps and a loss of core cooling capability. For similar reasons, switchover must not occur before there is sufficient water in the containment sump to provide sufficient net positive suction head (NPSH) to support ECCS pump operation. Furthermore, early switchover must not occur to ensure that sufficient borated water is injected from the RWST. This ensures the reactor remains shut down in the recirculation mode. To satisfy these requirements, the RWST Level Low-Low Allowable Value/Trip Setpoint has both upper and lower limits. The lower limit ensures switchover occurs before the RWST empties to prevent ECCS pump damage while the upper limit ensures the reactor remains shut down and that there is adequate water inventory in the containment recirculation sumps to provide ECCS pump suction.

The Engineered Safety Features Actuation System senses selected plant parameters and determines whether or not predetermined limits are being exceeded. If they are, the signals are combined into logic matrices sensitive to combinations indicative of various accidents, events, and transients. Once the required logic combination is completed, the system sends actuation signals to those Engineered Safety Features components whose aggregate function best serves the requirements of the condition. As an example, the following actions may be initiated by the Engineered Safety Features Actuation System to mitigate the consequences of a steam line break or loss-of-coolant accident: (1) Safety

SECTION IV

DETERMINATION OF SIGNIFICANT HAZARDS FOR PROPOSED CHANGES

IV. DETERMINATION OF SIGNIFICANT HAZARDS FOR PROPOSED CHANGES

License Amendment Request (LAR) 01-07 propose changes to the Seabrook Station Technical Specifications (TS) 3/4.3.1, "Reactor Trip System Instrumentation," and TS 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and its associated Bases. The proposed changes will revise TS Surveillance Requirements (SR) 4.3.1.2 and 4.3.2.2 to allow verification in lieu of demonstration (i.e., measurement/testing) of response time associated with certain pressure sensors, differential pressure sensors, Process Protection racks, Nuclear Instrumentation, and Logic Systems. The proposal is in accordance with the basis and methodologies outlined in WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," and WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests."

In accordance with 10 CFR 50.92, North Atlantic has concluded that the proposed changes do not involve a significant hazards consideration (SHC). The basis for the conclusion that the proposed changes do not involve a SHC is as follows:

1. *The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.*

   The proposed changes to TS 3/4.3.1 and TS 3/4.3.2 do not result in a condition where the design, material, and construction standards that were applicable prior to the proposed changes are altered. The same Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) instrumentation is being used; the response time allocations/modeling assumptions in the Seabrook Station UFSAR analyses are still the same; only the method of verifying time response is changed. The proposed change will not modify any system interface and will not increase the probability or consequences of an accident previously evaluated since these events are independent of this change.

   The proposed changes do not affect the source term, containment isolation or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated in the Seabrook Station UFSAR. Further, the proposed changes do not increase the types and amounts of radioactive effluent that may be released offsite, nor significantly increase individual or cumulative occupational/public radiation exposures.

   Therefore, it is concluded that these proposed revisions to TS 3/4.3.1 and TS 3/4.3.2 do not involve a significant increase in the probability or consequence of an accident previously evaluated.

2. *The proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.*

The proposed changes to TS 3/4.3.1 and TS 3/4.3.2 do not alter the performance of the pressure and differential pressure sensors used in the plant protection systems, nor do the proposed changes alter the performance of the Process Protection racks, Nuclear Instrumentation, and Logic Systems used in the plant protection systems. The sensors will still have their response time verified by test before placing the sensor in operational service and after any maintenance that could affect response time; and the plant protection systems will still have response time verified by test before being placed in operational service.

For the pressure and differential pressure sensors; and for the Process Protection racks, the Nuclear Instrumentation, and the Logic Systems; changing the method of periodically verifying instrument response from time response testing to calibration and channel checks (assuring equipment operability) will not create any new accident initiators or scenarios.

The periodic calibration of the pressure and differential pressure sensors will detect significant degradation in the sensor response characteristic.

The periodic calibration of the Process Protection racks, the Nuclear Instrumentation, and the Logic Systems will continue to be used to detect significant degradation that could cause the response time characteristic to exceed the total allowance. The total time response allowance for each function bounds degradation that cannot be detected by the periodic surveillance.

Thus, these proposed revisions to TS 3/4.3.1 and TS 3/4.3.2 do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *The proposed changes do not involve a significant reduction in the margin of safety.*

The proposed changes to TS 3/4.3.1 and TS 3/4.3.2 do not affect the total system response time assumed in the Seabrook Station UFSAR analyses. The periodic system response time verification method for the pressure and differential pressure transmitters; and the periodic system response time verification method for the Process Protection racks, the Nuclear Instrumentation, and the Logic Systems, is modified to allow use of actual test data or engineering data. The method of verification will continue to provide assurance that the total system response is within that defined in Seabrook Station UFSAR analyses.

For the pressure and differential pressure sensors, calibration tests will detect degradation, which might significantly affect sensor response time.

For the Process Protection racks, the Nuclear Instrumentation, and the Logic Systems calibration tests will continue to be performed which would detect significant degradation which might cause the response time to exceed the total allowance. The total time response allowance for each function bounds degradation that cannot be detected by the periodic surveillance.

Thus, it is concluded that these proposed revisions to TS 3/4.3.1 and TS 3/4.3.2 do not involve a significant reduction in a margin of safety.

Based on the above evaluation, North Atlantic concludes that the proposed changes to TS 3/4.3.1 and TS 3/4.3.2 do not constitute a significant hazard.

SECTIONS V AND VI

PROPOSED SCHEDULE FOR LICENSE AMENDMENT ISSUANCE AND EFFECTIVENESS

AND

ENVIRONMENTAL IMPACT ASSESSMENT

V. PROPOSED SCHEDULE FOR LICENSE AMENDMENT ISSUANCE AND EFFECTIVENESS

North Atlantic requests NRC review of License Amendment Request 01-07, and issuance of a license amendment by March 29, 2002, having immediate effectiveness and implementation within 60 days. Issuance of a license amendment by the requested date would afford North Atlantic the flexibility for planning of technical resources in support of Seabrook Station's upcoming refueling outage currently scheduled in May 2002.

VI. ENVIRONMENTAL IMPACT ASSESSMENT

North Atlantic has reviewed the proposed license amendment against the criteria of 10 CFR 51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor increase the types and amounts of effluent that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, North Atlantic concludes that the proposed changes meet the criterion delineated in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.