

# NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY  
THE HARTFORD ELECTRIC LIGHT COMPANY  
WESTERN MASSACHUSETTS ELECTRIC COMPANY  
HOLYOKE WATER POWER COMPANY  
NORTHEAST UTILITIES SER. CO. COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

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January 16, 1979

Docket No. 50-336

Director of Nuclear Reactor Regulation  
Attn: Mr. R. Reid, Chief  
Operating Reactors Branch #4  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

References: (1) D. C. Switzer letter to G. Lear dated December 27, 1976.  
(2) D. C. Switzer letter to G. Lear dated July 27, 1977.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2  
Automatic Test Injection

In Reference (1), Northeast Nuclear Energy Company (NNECO) proposed to revise the Technical Specifications to authorize the use of Automatic Test Injection (ATI) to satisfy certain surveillance requirements regarding Engineered Safety Feature Actuation System (ESFAS) instrumentation.

Subsequent to our meeting of April 26, 1977, NNECO docketed Reference (2), which formalized its intent to qualify the use of ATI after having collected one year of operating data on that feature.

Accordingly, NNECO hereby submits Attachment (1), Qualification of Automatic Test Injection, in support of the License Amendment request of Reference (1). Three specific aspects of the performance history of ATI are discussed in support of this proposed change. The inservice availability of ATI to date has been superb; since its initial use in 1975, it has never been out of service. ATI has detected every intentional fault applied to the ESFAS since January, 1977. The inservice performance of ATI has also been flawless; the details of the incidents involved are described in Attachment (1). The synergistic effect of these three items is to render obvious the conclusion that ATI is a comprehensively qualified method of demonstrating compliance with the applicable segment of Technical Specification 4.3.2.1.1. Therefore, NNECO's request of Reference (1) is respectfully reiterated.

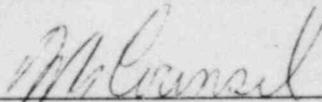
NNECO has also reconfirmed the applicability of the determinations documented in Reference (1) with respect to 10CFR50.59.

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NNECO has reviewed this proposal pursuant to the requirements of 10CFR170, and has determined that no fee is applicable in this instance. The basis for this determination is that this submittal is merely supplementary information regarding the Reference (1) proposal. The original request is unchanged and was docketed well before the effective date of Part 170.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



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W. G. Council  
Vice President

Attachment

ATTACHMENT (1)

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

QUALIFICATION OF AUTOMATIC TEST INJECTION

## MILLSTONE POINT 2

### E.S.F.A.S. Equipment

#### QUALIFICATION OF AUTOMATIC TEST INJECTION (ATI)

Reference (1) D. C. Switzer letter to G. Lear dated December 27, 1976

#### Introduction

Performance of the ATI (designed as an integral part of the E.S.F.A.S.) is discussed, and data is presented to establish the suitability of ATI for performing the surveillance activities identified in the station Technical Specification 4.3.2.1.1.

Analysis of the data obtained provides confirmatory evidence for a high degree of confidence in the ability of the ATI to perform its design function. It is concluded that credit for ATI to perform E.S.F.A.S. required surveillance tests is technically acceptable.

#### Basis for Qualification

This is presented in three parts which evaluate,

- a) The inservice availability of ATI since 1975.
- b) The results of periodic testing performed since January, 1977. This testing also challenges the ATI by intentionally introducing failures in the E.S.F.A.S.
- c) ATI performance in detecting unintentional E.S.F.A.S. failures since 1975.

#### a) Inservice Availability

Concurrent with the first use of the E.S.F.A.S. in 1975, ATI has always been operational. It has performed an indicate only function to alert the operators of possible E.S.F.A.S. problems.

ATI simultaneously interrogates each two channel combination of every four channel protective input every 25 seconds, and establishes the protective functions ability to operate on a two-out-of-four basis at the correct setpoint level. In addition, and with the same time interval, ATI also establishes that the protection setpoints are within tolerance by testing the channels at values outside the setpoint levels.

Since its initial use in 1975 the availability of ATI has been 100%. No component failures have occurred, and it has not been necessary to take the ATI out of service for maintenance or modification.

Full (sensor to final device) functional testing, undertaken at each refueling, has not discovered any failures within the E.S.F.A.S. which should have been identified by ATI. Additionally, we have not found it necessary to institute a test of the ATI itself in order to verify its functional ability.

b) Periodic Testing Since January 1977

Station Test Procedure 2403A, "E.S.F.A.S. Bistable Trip Test and ATI Tests", was modified in January, 1977 to include the intentional application of faults within the E.S.F.A.S. to verify the ability of ATI to detect such faults.

The procedure requires that 28 separate faults (maladjustment of bistable set points) are applied and that for each separate fault the ability of the ATI to detect the failure is verified.

Since January, 1977, procedure 2403A has been performed nineteen times, and in no single instance (532 intentional failures) has the ATI failed to discover the fault applied.

Concurrent with this procedure, the correct protective function of each channel input has also been verified using Manual Test Insertion (described in Reference (1) ), and on no occasion has a fault been discovered using the manual test, which fault should have been detected by the ATI.

c) ATI Inservice Performance

Plant records indicate that since February, 1977, five reports have been made as a result of ATI indicating an E.S.F.A.S. failure.

Report #1, 2/4/77, MR (Maintenance Request) 487-77.

In this report, ATI identified a fault in the protective function for Containment Radiation High. Inspection confirmed this was due to the Containment Radiation output module being in the tripped condition having responded to a radiation high signal. The radiation high set-points are presently the subject of discussion with the NRC staff, however, the ATI operated correctly in identifying that a protective function was holding an actuation module in the tripped condition.

Report #2, 3/12/77, MR 768-77

ATI indicated a problem with Channel 3 of the Pressurizer Pressure protective function.

This was determined to be due to the ATI test signal level being out of adjustment with its respective bistable setpoint. This difference caused the ATI to indicate a failure although the channel was operable.

Report #3, 4/29/77, MR 1202-77

ATI indicated that the AEAS channel B was not responding to the automatic test.

Inspection of the channel discovered a broken ground wire. This had the effect of removing power from a logic module within the channel being tested by the ATI. Removal of power results in the module being unable to respond to either an actuation or ATI signal.

Report #4, 7/13/77, MR 1805-77

ATI indicated a problem with all Pressurizer Pressure channels A, B, C and D.

The problem was found to be incorrect alignment of the ATI test levels with respect to the bistable setpoint levels. The ATI test levels were aligned and the problem cleared.

In this instance the ATI reported a defect although the protective channels were operable.

Report #5, 10/27/78, MR 2617-78

ATI indicated a fault in Fuel Area Exhaust Radiation High, Channel "D".

This was subsequently determined to be due to a manual change in the setpoint of the respective channel bistable without having made an appropriate change in the ATI test signal level. ATI sensed this condition as bistable setpoint drift and in consequence a failure was determined although the channel was operable.

### Conclusions

During the period since 1975, ATI has functioned with remarkable reliability, testing two-out-of-four channels of all protective functions every 25 seconds. The out of service time for maintenance or component replacement has been nil, and ATI has established itself as a most comprehensive evaluative test method. When challenged with several hundred intentionally applied faults, it has never failed to discover and identify the faulted channel within its overall test program.

In the five instances reported where ATI identified a failure, all such operations were subsequently determined to be correct for the situation discovered. In the one instance (report 3) where the channel was discovered not functional, ATI reported this at the time it happened rather than at the next surveillance, as would have been the case with manual testing.

Overall, the performance of the E.S.F.A.S. has been exceptional, especially in regard to failed components. Although this means that ATI has not been required to report numerous degraded or failed conditions, our confidence

in its ability to perform correctly and reliably has been established on the basis of protracted operational availability, data received from test programs, and extraneous failure situations reported immediately when they occurred.

We conclude that ATI is a comprehensively qualified method of demonstrating compliance with the applicable segment of Technical Specification 4.3.2.1.1.

ARR/psn

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