

Mr. Martin L. Bowling  
Recovery Officer-Millstone  
Unit No. 2  
Northeast Nuclear Energy Company  
c/o Ms. Patricia A. Loftus  
Director - Regulatory Affairs  
P.O. Box 128  
Waterford, CT 06385

January 23, 1998

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATING TO THE REQUEST  
TO WITHDRAW AN ANTICIPATED TRANSIENT WITHOUT SCRAM (ATWS)  
TEST COMMITMENT-MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2  
(TAC NO. M99614)

Dear Mr. Bowling:

By letter dated September 5, 1997, Northeast Nuclear Energy Company (NNECO) requested approval to withdraw an ATWS test commitment for the Millstone Nuclear Power Station, Unit No. 2. In its letter, NNECO stated that the provisions to test one set of AC Voltage Output Low alarms, Charger Trouble alarms, and DC Bus Under Voltage alarms, at alternate refueling outages, were not implemented. Subsequently, NNECO requested withdrawal of its commitment made on July 25, 1988, to conduct these tests as part of its ATWS modifications.

The staff is currently reviewing the request and has determined that additional information is needed to complete its review. The information needed is identified in the enclosure to this letter.

If you have any questions relating to this request, please contact me at (301) 415-1408.

Sincerely,

Original signed by:

Daniel G. McDonald, Jr., Sr. Project Manager  
Special Projects Office - Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: Request for Additional  
Information

cc w/encl: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

January 23, 1998

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Recovery Officer-Millstone  
Unit No. 2  
Northeast Nuclear Energy Company  
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Director - Regulatory Affairs  
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A handwritten signature in dark ink, appearing to read "Daniel G. McDonald, Jr.", written in a cursive style.

Daniel G. McDonald, Jr., Sr. Project Manager  
Special Projects Office - Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-336

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cc w/encl: See next page

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Northeast Nuclear Energy Company

Millstone Nuclear Power Station  
Unit 2

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REQUEST FOR ADDITIONAL INFORMATION

ATWS COMMITMENT WITHDRAWAL

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

NORTHEAST NUCLEAR ENERGY COMPANY

DOCKET NO. 50-336

Background

The ATWS Rule requires that the equipment/systems installed to prevent and/or mitigate the consequences of ATWS events be electrically independent of the existing reactor protection system (RPS) to minimize the potential for common mode failures (CMFs) that could affect both RPS and ATWS circuits. Electrical independence of the diverse scram system (DSS) from the existing RPS should be provided from the sensor outputs up to and including the final actuation device. The ATWS design at NNECO shares a common power supply between the RPS and DSS which deviates from the staff guidance provided in the supplemental information concerning electrical independence that was published with the ATWS Rule.

In Question 2.a.2 of a letter from the NRC dated June 8, 1985 (Ref 1), the NRC asked NNECO to explain why a CMF affecting the RPS power distribution system, including degraded voltage and frequency conditions, that would compromise both the RPS and the ATWS prevention/mitigation functions, cannot go undetected. Also, if alarms were relied on to provide early detection of degraded voltage and/or frequency conditions, NNECO was requested to identify the specific alarms and their setpoints, along with a discussion of the periodic surveillance testing performed to verify alarm operability.

NNECO responded by stating that the Vital AC power to the four-channel RPS and the four-channel DSS is supplied from four vital inverters. These inverters are equipped with the following local and control room alarms and indications:

1. Input Breaker Trip
2. AC Voltage Output Low (Setpoint of 108 VAC)
3. AC Ground Fault
4. High Temperature (Setpoint of 175 DEG. F.)

The inverters are powered by a station 125 VDC system, which consists of two batteries, three battery chargers, and two battery busses. Each bus powers two inverters which in turn provide the four separate channels of vital 120 volt AC for the four-channel RPS and DSS. The battery bus and battery charger systems are monitored and alarmed for various conditions including:

1. Charger Trouble:
  - a. High Voltage at 150 VDC
  - b. Low Voltage at 120 VDC
2. DC Bus Under Voltage at 126 VDC
3. Ground Alarms
4. Indications are provided for Battery current and voltage, DC bus current and voltage.

In summary NNECO stated that the current practice calls for testing of DC Bus Under voltage alarms at every other outage. "However, revised procedures to be implemented at the next planned refueling outage call for testing one set of **AC Voltage Output Low alarms, Charger Trouble alarms, and DC Bus Under voltage alarms** at alternate refueling outages. This revised procedure ensures that one set of these alarms are tested each outage." On September 5, 1997 (Ref 2), the NRC was informed that provisions to test the above alarms were not implemented and NNECO requested withdrawal of a commitment it made on July 25, 1988 (Ref 3) to conduct the above tests as part of its ATWS modifications.

#### Issue

With a common power supply between the RPS and DSS and the withdrawal of the ATWS commitment, NNECO should provide the following information to demonstrate that CMF of shared power sources will not result in loss of both RPS and DSS prevention/mitigation functions.

#### Questions

1. NNECO stated that "routine inspections performed on the various power distribution components, and the manifestation of degraded voltage and/or frequency conditions by off-normal responses from a variety of systems and indications, these occurrences are considered detectable."

Please verify that, based on the above statement, NNECO has the capability to detect degraded conditions on the power distribution system without reliance on or taking credit for the alarms in question (AC Voltage Output Low alarms, Charger Trouble alarms, and DC Bus Under voltage alarms).

2. NNECO stated that: (a) Degraded conditions on a battery bus or charger would, in the worst case, impact two (out of the four) channels of both the ATWS mitigating system and the RPS and, (b) Degraded conditions on a 125 VDC or 120 Vital AC inverter or panel would, in the worst case, impact one (out of four) channels of both the ATWS mitigating system and the RPS. Neither of these occurrences would prevent the ATWS mitigating system (which includes the DSS) and the RPS from performing their intended functions.

a. Please verify that the likely combination of degraded conditions on battery Bus 201B, which would impact two channels (associated with Vital Bus VA20 and VA40) and, channel A high pressurizer pressure of the RPS in bypass, will not prevent the ATWS mitigating system (which includes the DSS) and the RPS from performing their intended functions.

b. Please verify that the likely combination of degraded conditions on a 125 VDC or 120 Vital AC inverter #2 (Vital Bus VA20), which would impact logic matrices BC, BD, and CD and, channel A high pressurizer pressure of the RPS in bypass, will not prevent the ATWS mitigating system (which includes the DSS) and the RPS from performing their intended functions.



REFERENCES

1. D. H. Jaffe letter to E. J. Mroczka, "Millstone Nuclear Power Station, Unit No. 2, Request for Additional Information," dated June 8, 1988.
2. M. L. Bowling, Jr., letter to U.S. Nuclear Regulatory Commission " ATWS Modification (TAC No. 59114) 'Withdrawal of Commitment,'" dated September 5, 1997.
3. E. J. Mroczka letter to U.S. Nuclear Regulatory Commission " ATWS Modification (TAC No. 59114) ," dated July 25, 1988.