

NORTHEAST UTILITIES

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 HOLYOKE WATER POWER COMPANY
 NORTHEAST UTILITIES SERVICE COMPANY
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April 3, 1991

Docket No. 50-423

B13787

Re: 10CFR50.90
 10CFR50.91

U.S. Nuclear Regulatory Commission
 Attention: Document Control Desk
 Washington, DC 20555

Reference: (1) E. J. Mrocza letter to the U.S. Nuclear Regulatory Commission, Proposed Revision to Technical Specifications--Hydrogen Recombiner, dated January 18, 1991.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
 Proposed Revision to Technical Specifications
 Hydrogen Recombiners
Request for Emergency Authorization and Approval

In a letter dated January 18, 1991 (Reference [1]), Northeast Nuclear Energy Company (NNECO) proposed to amend Operating License NPF-49 by revising the Millstone Unit No. 3 Technical Specifications regarding the surveillance requirements for the hydrogen recombiners. The purpose of this letter is to request that the NRC staff process the above-referenced license amendment request on an emergency basis in accordance with 10CFR50.91(a)(5). As discussed below, this request involves no significant hazards consideration, and failure to act promptly would prevent start-up of the plant from the present refueling outage. Plant start-up (i.e., criticality) is currently scheduled for April 6, 1991. Alternatively, it is requested that a temporary waiver of compliance from Technical Specification Section 4.6.4.2.b.4 be granted until the Staff acts on the emergency amendment. The justification for emergency authorization and approval is provided below.

Background

The proposed amendment request (Reference [1]) revises the surveillance requirements for the hydrogen recombiners based upon new technical information received from the blower manufacturer, M-D Pneumatics. This information indicates that the flow versus containment pressure curve should be replaced by a series of equations. The new equations use actual inlet pressure and temperature and the pressure rise across the blowers to predict the actual blower flow rate. Thus, a considerably more accurate flow acceptance determination can be made. The Millstone Unit No. 3 Technical Specification Figure 3.6-2 (Amendment No. 47) is based on the pressure-flow curves supplied by the manufacturer which assumed a standard condition (70°F and atmospheric pressure) at the blower outlet.

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On March 27, 1991, as a part of the 18-month surveillance test, a functional test of the Millstone Unit No. 3 hydrogen recombiner (A) was performed using the acceptance criteria included in Section 4.6.4.2.b.4 (License Amendment No. 47). The test results indicate that the hydrogen recombiner is capable of delivering a flow rate of approximately 74.5 scfm at a containment pressure of 14.77 psia. This represents a failure to meet the acceptance criteria of Technical Specification Figure 3.6-2 by approximately 2 scfm. On March 29, 1991, when the same test was repeated, the hydrogen recombiner (A) passed the acceptance criteria of Technical Specification Figure 3.6-2. The blower put out a minimum flow rate of 74.3 scfm at a containment pressure of 14.5 psia, while the acceptance criterion was 74 scfm. On March 31, 1991, the same functional test was performed on the redundant hydrogen recombiner (B) to verify its operability. The test data indicated that the hydrogen recombiner (B) failed to meet the acceptance criteria of Technical Specification Figure 3.6-2, giving a flow rate of approximately 72.5 scfm against an acceptance criterion of 76.5 scfm at a containment pressure of 14.8 psia. On April 2, 1991, NNECO performed the same test again on the hydrogen recombiner (B). The test results indicate that the hydrogen recombiner (B) is capable of delivering a flow rate of approximately 73.6 scfm at 14.725 psia whereas the required flow rate is 75 scfm.

Figure 3.6-2 was developed using generic information for this type of blower. Since the issuance of Amendment No. 47, new technical information was received from the blower manufacturer, M-D Pneumatics, which indicates that the flow versus containment pressure curve should be replaced by a series of equations for increased accuracy. These equations use actual temperatures and pressures to calculate the recombiner flow. The equations provided by the blower manufacturer are provided in Attachment 1, and are the basis for the proposed Surveillance 4.6.4.2.b.5 included in the proposed amendment request (Reference [1]). Using the proposed acceptance criteria, the blower performance is acceptable. Specifically, the expected performance of the 'B' blower in an accident condition would be over 49 scfm, whereas the required flow rate to maintain hydrogen levels below 4 percent is 40.5 scfm. This method of testing ensures a performance level for hydrogen recombiners which meets the requirement of the design basis analysis.

Based on these test results, NNECO could not verify the operability of both the hydrogen recombiners using the acceptance criteria included in Technical Specification Figure 3.6-2. Therefore, on April 2, 1991, NNECO informed the Staff of the current situation and our plan to request that the NRC Staff process the previously docketed license amendment on an emergency basis.

Justification for Emergency License Amendment Request

Pursuant to 10CFR50.91(a)(5), NNECO hereby requests NRC Staff approval of the license amendment submitted on January 18, 1991 (Reference [1]), on an emergency basis. Emergency approval is appropriate because "an emergency situation exists, in that failure to act in a timely way would result in . . . prevention of . . . increase in power output up to the plant's licensed power

level," the situation could not have been avoided, and because the proposed amendment does not involve a significant hazards consideration (SHC).

Presently, Millstone Unit No. 3 is in Mode 5 because the plant was shut down for a refueling outage on February 2, 1991. Emergency authorization is required to permit timely resumption of operation (i.e., criticality) which is currently scheduled for April 6, 1991. Since the issuance of Amendment No. 47, new technical information was received from the blower manufacturer, M-D Pneumatics, which indicates the flow versus containment pressure curve can be replaced by a series of equations for increased accuracy. These equations use actual inlet pressure and temperature and pressure rise across the blowers to predict the blower flow rates. Thus, a considerably more accurate flow acceptance determination can be made. Therefore, pursuant to 10CFR50.90, on January 18, 1991, NNECO submitted a license amendment request to the Staff. Based on a discussion with your Staff, we understand the license amendment request has not been noticed in the Federal Register as of this date. A normal license amendment request requires a 30-day notice period in the Federal Register. Accordingly, there is insufficient time to process a normal license amendment in time for start-up of the plant beginning April 6, 1991. Since the submittal of the proposed amendment to the Staff on January 18, 1991, NNECO has been in frequent contact with the NRC Project Manager to continue expediting the review and approval process.

Further, the requested emergency authorization is appropriate because this amendment request does not involve an SHC. Therefore, NNECO requests that this amendment request be approved to support the start-up of the plant. Alternatively, it is requested that a temporary waiver of compliance from Technical Specification 4.6.4.2.b.4 be granted until the Staff acts on the proposed amendment.

Temporary Waiver of Compliance

NNECO hereby requests a temporary waiver of compliance from Technical Specification Section 4.6.4.2.b.4 until the license amendment submitted via Reference (1) is issued by the NRC Staff. In support of this request, NNECO provides the following information:

o Requirements for Which a Waiver is Requested

NNECO is requesting, if necessary, a waiver from Technical Specification 4.6.4.2.b.4 (regarding recombiner system functional test using containment atmospheric air) until an emergency license amendment, as described herein, can be processed and issued.

o Discussion of Circumstances Surrounding the Situation/Need for Prompt Action/Why the Situation Could Not Be Avoided

The need to request this waiver could not have reasonably been avoided by NNECO. On January 18, 1991, NNECO submitted a proposed change to the Technical Specifications that would revise the surveillance requirement

by replacing the flow versus containment pressure curve with a series of equations using actual inlet pressure and temperature and pressure rise across the blowers to predict blower flow rate. In January, NNECO believed that adequate time was available to disposition this license amendment without the need for expedient treatment.

o Discussion of Compensatory Actions

The hydrogen recombiner system is not normally in operation. The design basis analysis shows that containment hydrogen concentration remains below 4 percent during a loss-of-coolant accident if the recombiners are started within 24 hours of the accident.

The results of the test performed per the proposed Surveillance 4.6.4.2.b.5 have confirmed that no unacceptable level of degradation has occurred in the blower performance. This ensures a performance level of hydrogen recombiners which meets the requirement of the design basis analysis. Therefore, there are no additional compensatory actions required during the time frame this waiver of compliance would be in effect.

o Safety Significance and Potential Consequences of Request

The purpose of this letter is to allow Millstone Unit No. 3 to continue power ascension from the current Mode 5 to Mode 1.

o Discussion Justifying the Duration of the Request

The temporary waiver of compliance is being requested, if necessary, from the time period from April 6, 1991, until the license amendment request submitted via Reference (1) is processed and issued. Issuance of the requested amendment would allow the 18-month surveillance test to be conducted utilizing a series of equations that are based on actual inlet air pressure and temperature and pressure rise across the blowers to predict blower flow rate. Had this new surveillance technique been used on March 27, 29, 31, or April 2, 1991, when the surveillance was performed, we would have met the acceptance criteria of the surveillance.

o Basis for the No SHC Determination

The requested temporary waiver of compliance does not constitute an SHC for the same reasons documented in the license amendment request submitted to the NRC on January 18, 1991 (Reference [1]).

o Basis for No Irreversible Environmental Consequences

The proposed temporary waiver of compliance has no environmental impact since the waiver simply allows Millstone Unit No. 3 to continue power ascension to Mode 1 while the NRC processes a license amendment for the hydrogen recombiner 18-month surveillance requirement. Protective

U.S. Nuclear Regulatory Commission
B13787/Page 5
April 3, 1991

boundaries are not directly affected in that postaccident containment response capabilities remain unchanged.

Significant Hazards Consideration

As documented in the January 18, 1991, letter, NNECO concluded that this license amendment request does not constitute an SHC.

Conclusion

NNECO has concluded that it is appropriate and necessary that the January 18, 1991, license amendment request be processed on an emergency basis for the following reasons:

- o The amendment request is needed to permit the start-up and continued operation of the plant.
- o The license amendment does not constitute an SHC.
- o NNECO made every effort to process this request in a timely manner to avoid this situation.

We also wish to emphasize our conclusion that this proposed amendment involves no undue safety risk nor irreversible environmental consequences. We are therefore requesting this action to allow the start-up and continue operation of the plant, an action which is in the best interest of the health and safety of the public, our customers, and our shareholders.

Based on the information contained in this submittal and the environmental assessment for Millstone Unit No. 3, there are no significant radiological or nonradiological impacts associated with the proposed actions, and the proposed license amendment will not have a significant effect on the quality of the human environment.

In accordance with 10CFR50.91(b), NNECO will provide the State of Connecticut with a copy of this request via electronic mail to ensure their awareness of this request.

We believe the above information provides a complete basis for approval of the requested amendment. We will continue to keep you informed on matters relevant to this request.

Docket No. 50-423
B13787

Attachment 1

Millstone Nuclear Power Station, Unit No. 3
Hydrogen Recombiner Blower Equations

April 1991

Millstone Nuclear Power Station, Unit No. 3
Hydrogen Recombiner Blower Equations

d.

and record the following information:

Pcont--Containment--Average of 3LMS*P934, 935, 936, and 937

Pout--From 3HCS-PI1A or B

Tc--Containment temperature

Pin--Measure with a new inlet gauge or calculate from Equation 2a below

scfm measured--See Procedure/Form 3613A.3-1

ΔP_f --From Table 2 (attached)

2. Equations to calculate as found slip constant

a. $P_{in} = P_{containment} - \Delta P_f$

b. Effective Pressure Rise EPR

$$EPR = \left(\frac{P_{out}}{P_{in}} * 14.7 \right) - 14.7$$

c. Gas Slip Correction Factor (GSCF)

$$GSCF = \left(\frac{14.7}{P_{in}} * \frac{T_c + 460}{528} \right)^{1/2}$$

d. Slip RPM

$$= A * (EPR)^{1/2} * GSCF$$

e. Actual Inlet CFM

$$ACFM = 0.28 (3550 \text{ RPM} - \text{Slip RPM})$$

f. Standard CFM

$$\text{scfm} = ACFM \frac{P_{in}}{14.7} * \frac{528}{T_c + 460}$$

g. Adjusted Flow Rate

$$\text{scfm adjusted} = (\text{scfm} * 0.95) \text{ should equal (scfm-measured accuracy range)}$$

h. Calculating A by substituting the above equations into g

$$A = \frac{3550 - \left(\left[\frac{\text{scfm}_{\text{measured}} - \text{Accuracy}}{0.028 * 0.95} \right] * \left[\frac{14.7}{P_{\text{in}}} * \frac{T_c + 460}{528} \right] \right)}{\left(\left[\frac{P_{\text{out}}}{P_{\text{in}}} * 14.7 \right] - 14.7 \right)^{1/2} * \left(\frac{14.7}{P_{\text{in}}} * \frac{T_c + 460}{528} \right)^{1/2}}$$

3. Equations to calculate postaccident flow rate using A calculated in Step 2.

a. Effective Pressure Rise EPR

$$\text{EPR} = 2.01$$

b. Gas Slip Correction Factor (GSCF)

$$\text{GSCF} = 1.234$$

c. Slip RPM

$$= A * (\text{EPR})^{1/2} * \text{GSCF}$$

d. Actual Inlet CFM

$$\text{ACFM} = .028 (3550 \text{ RPM} - \text{Slip RPM})$$

e. Standard CFM

$$\text{scfm} = \text{ACFM} 0.6568$$

f. Postaccident Minimum Flow Rate

$$\text{Postaccident scfm Minimum} = \text{scfm} * 0.95$$

g. Acceptance Flow Rate

$$\text{Postaccident scfm minimum} > 40.5 \text{ scfm.}$$

Table 1 Accuracy Range (Ref. 2)

| <u>scfm (measured)</u> | <u>Accuracy Range</u> |
|------------------------|-----------------------|
| 40 to 50 | 5.8 scfm |
| 50 to 80 | 4.7 scfm |

Table 2 Inlet Piping Friction Loss

| <u>scfm Measured (unadjusted)</u> | <u>ΔP_f (psi)</u> |
|---------------------------------------|--------------------------------------|
| 30 | .21 |
| 40 | .31 |
| 50 | .52 |
| 60 | .73 |
| 70 | .98 |
| 80 | 1.28 |

- References:
1. Calculation 90 RPS-722GM, "Flow Acceptance Criteria for 3HCS*RBNR 1A/B Blowers 3HCS*G1A/B."
 2. Calculation PA 90-LOE-0132GE, "Hydrogen Recombiner Flow Error Analysis."