



**Northeast
Nuclear Energy**

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The Northeast Utilities System

APR 19 2000

Docket No. 50-423
B18088

Re: 10 CFR 2.790
10 CFR 50.90

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

**Millstone Nuclear Power Station, Unit No. 3
License Amendment Related to the Supplementary Leakage Collection and
Release System (PLAR 3-98-5), Supplemental Information**

This letter supersedes and replaces a Northeast Nuclear Energy Company (NNECO) letter of the same subject dated April 7, 2000.⁽¹⁾ Proprietary information subject to the nondisclosure provisions of 10 CFR 2.790 was included in the April 7, 2000, letter, but due to a processing error, the part of the material to be withheld and the accompanying affidavit were not properly identified. In addition, a footnote reference was incorrectly stated. Recipients of the April 7, 2000, letter are requested to either destroy it or return it to NNECO to preclude inadvertent disclosure of proprietary information.

This letter contains proprietary information provided by Stone & Webster Engineering Corporation. Pursuant to 10 CFR 2.790, it is requested that the report entitled "Analysis of Containment Mixing Rate During a Design Basis LOCA," (see Enclosure 1 of Attachment 2) describing the Stone & Webster Mixing Model, be withheld from public disclosure. Upon separation of Enclosure 1 of Attachment 2 from this letter, this letter may be decontrolled.

⁽¹⁾ R. P. Necci letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - License Amendment Related to the Supplementary Leakage Collection Release System (PLAR 3-98-5) Supplemental Information," dated April 7, 2000.

APR 19 2000

Background

In a letter dated June 6, 1998,⁽²⁾ NNECO applied for an amendment to the Millstone Unit No. 3 Operating License to reflect changes in the licensing basis for post-accident operation of the Supplementary Leakage Collection and Release System (SLCRS) as described in the Final Safety Analysis Report (FSAR).

The U.S. Nuclear Regulatory Commission (NRC) Staff requested additional information via letters dated August 20, 1998,⁽³⁾ and January 25, 1999.⁽⁴⁾ NNECO provided that information in a letter dated April 5, 1999.⁽⁵⁾ In May 1999, NNECO requested by telephone that the NRC temporarily suspend its review of this license amendment request.

Discussion

The suspension request was prompted by an internally identified concern related to the adequacy of the original Licensing Basis documentation supporting the determination of spray coverage within the free volume of containment. The concern related to the overall qualitative nature of the basis information supporting the original containment sprayed volume determination. Because the containment spray coverage determination is used to establish the iodine removal efficiency of the sprays, it has a direct impact on the associated post-accident dose assessment. For this reason, NNECO believed it prudent to suspend further NRC review of the application until the associated impact on the dose assessment could be determined.

This matter was resolved by developing a formal calculation which accounted for spray pattern geometry, internal structural interference and post LOCA pressure compression effects on overall spray distribution patterns. This analysis subdivides the Millstone Unit No. 3 containment into 3 distinct regions, and then applies the mixing model described in NNECO's response to dated April 5, 1999,⁽⁵⁾ to evaluate inter-region mixing rates. Based on this evaluation, two of the three regions exhibited mixing rates which supported their being combined into a single "effectively" sprayed volume.

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- ⁽²⁾ M. H. Brothers letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - Proposed License Amendment Request SLCRS Bypass Leakage (PLAR 3-98-5)," dated June 6, 1998.
- ⁽³⁾ J. W. Andersen (USNRC) letter to M. L. Bowling, Jr., "Millstone Nuclear Power Station, Unit 3 - Request for Additional Information (TAC No. MA2035)," dated August 20, 1998.
- ⁽⁴⁾ J. W. Andersen (USNRC) letter to M. L. Bowling, Jr., "Millstone Nuclear Power Station, Unit No. 3 - Request for Additional Information (TAC No. MA2035)," dated January 25, 1999.
- ⁽⁵⁾ R. P. Necci letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - License Amendment Related to the Supplementary Leakage Collection and Release System (PLAR 3-98-5), Response to Request for Additional Information," dated April 5, 1999.

Combining this effectively sprayed volume with the remaining direct sprayed volume of the third region, resulted in a "sprayed volume" of containment that was slightly larger than that used in NNECO's earlier analysis.

An evaluation of the impact of these changes on the radiological analyses supporting PLAR 3-98-5 has also been completed. It has been determined that while several of the radiological assessment input parameters require revision, the analyses results and safety conclusions discussed in NNECO's original application remain bounding. This conclusion is based on the fact that the revised methodology employed in the determination of the containment spray coverage continues to support the use of an iodine removal decontamination factor of 200 as was previously applied in the original analysis. Consequently, NNECO requests that the NRC resume its review of the proposed amendment.

In support of this request, NNECO is providing replacement pages and revised responses to update information previously submitted as follows:

1. Attachment 1 - A revised INSERT G for FSAR Table 15.6-9 to replace the associated insert transmitted with the original marked up pages of the Millstone Unit No. 3 FSAR.
2. Attachment 2 - Revised responses to Questions 4 and 5 of the NRC's letter dated January 25, 1999. Enclosure 1 of Attachment 2 provides a description of the Stone and Webster derived Containment Mixing Model, including a description of the application of the mixing model to the determination of the containment sprayed volume. Stone & Webster considers the material provided in Enclosure 1 to be proprietary information, and requests that it be exempt from public disclosure for commercial reasons.
3. Attachment 3 - A replacement page 1 of 2 for FSAR Table 15.0-11. This page has been revised to correct an editorial error that was identified in the original markup associated with the Exclusion Area Boundary (EAB) X/Q values. This change is provided for completeness and is unrelated to the calculation revisions previously described.

Application for Withholding Pursuant to 10 CFR 2.790

Enclosure 1 of Attachment 2, "Analysis of Containment Mixing Rate During a Design Basis LOCA," is proprietary information owned by Stone & Webster Engineering Corporation. As such, NNECO requests that the information contained in this enclosure be withheld from public disclosure pursuant to 10 CFR 2.790(a)(4). The accompanying affidavit is included in Enclosure 1. Upon separation of Enclosure 1 of Attachment 2 from this letter, this letter may be decontrolled.

There are no regulatory commitments contained within this letter.

U.S. Nuclear Regulatory Commission
B18088/Page 4

If you have any questions or comments regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, ext. 2346.

Very truly yours,

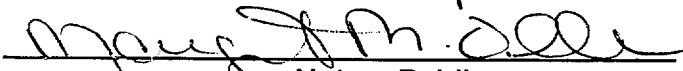
NORTHEAST NUCLEAR ENERGY COMPANY



M. H. Brothers
Vice President - Nuclear Operations

Subscribed and sworn to before me

this 19 day of April, 2000



Notary Public

Date Commission Expires: JUN 30 2004

Attachments (3): New INSERT G for FSAR Table 15.6-9
Revised Responses to NRC Questions
Replacement FSAR Table 15.0-11

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

Director
Bureau of Air Management
Monitoring and Radiation Division
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Docket No. 50-423
B18088

Attachment 1

Millstone Nuclear Power Station, Unit No. 3

License Amendment Related to the Supplementary Leakage Collection and
Release System (PLAR 3-98-5), Supplemental Information
New INSERT G for FSAR Table 15.6-9

INSERT G

11. Length of Time QSS is in Operation:	9660 sec
12. Effective Spray Coverage	52.78%
13. Maximum Iodine DF	200
14. Quench Spray Effective Time	70.2
15. Mixing Rate (hr-1) for unsprayed to Sprayed Regions	
70.5 - 166 sec:	4.65
166 - 495 sec:	11.82
495 - 790 sec:	7.72
790 - 835 sec:	11.82
835 - 3600 sec:	13.76
3600 - 9660 sec:	8.51
16. Sprayed Region Elemental Iodine Removal Coefficients (hr-1)	
spray	20
plate out	4.83
17. Sprayed Region Particulate Iodine Removal Coefficients (hr-1)	
<DF 50	10.51
>DF 50	1.18
18. Unsprayed Region Elemental Iodine Removal Coefficients (hr-1)	
spray	0
plate out (0-1800 sec)	1.28
19. Unsprayed Region Particulate Iodine Removal Coefficients (hr-1)	
<DF 50	0
>DF 50	0
20. No credit taken for iodine removal after QSS stop time	
21. Percentage of Total Containment Leakage into the Secondary Containment	
ESF building	10.59
MSV building	23.64
H2 Recombiner building	0.51
Containment Enclosure	7.77
Aux. bldg. EI 4'-6"	12.43
Aux. bldg. EI 24'-6"	21.08
Aux. bldg. EI 43'-6"	20.82
Aux. bldg. EI 66'-6"	3.17
22. Secondary Containment Free Volume (ft3)	
ESF building	168,373
MSV building	70,000
H2 Recombiner building	15,000
Aux. bldg. All elevation	913,500
23. 50% mixing in buildings that together form the secondary containment	
24. Unfiltered leakage via closed dampers occur in Aux, MSV and ESF buildings	

Docket No. 50-423
B18088

Attachment 2

Millstone Nuclear Power Station, Unit No. 3

**License Amendment Related to the Supplementary Leakage Collection and
Release System (PLAR 3-98-5), Supplemental Information
Revised Responses to NRC Questions**

Revised Responses to Questions 4 and 5

In a letter dated January 25, 1999,⁽¹⁾ the NRC Staff requested additional information related to the radiological controls aspect of the amendment request. NNECO's responses to these questions were transmitted in Attachment 1 (Part II) of a letter dated April 5, 1999.⁽²⁾ Based on the resolution of internal questions related to the containment sprayed volume determination, revised responses to Questions 4 and 5 are provided as follows with areas of change indicated by the margin bars.

Question 4

In the letter dated June 6, 1998, the notes to [FSAR] Table 15.0-8 report an EAB gamma dose for the rod ejection accident and EAB gamma and thyroid doses for the loss-of-coolant accident (LOCA) that are lower than the previous analysis. Considering that this submittal relates to identification of an additional leakage pathway, explain the above results.

Revised Response

As shown in the table below, higher calculated mixing rates in the most recent LOCA submittal (PLAR 3-98-5) account for faster removal of iodine when compared to the previous LOCA analysis. In the previous analysis, even though recirculation sprays continue to operate, the containment recirculation sprays are assumed to turn off at 7,480 seconds when quench sprays turn off. This termination is assumed for both elemental and particulate iodine removal. In the amendment request, elemental spray effectiveness is assumed to end and particulate spray effectiveness is reduced because the maximum decontamination factor (DF) values are reached prior to quench spray termination (see Table 4).

The slight decrease in gamma dose is due to taking credit for 50 percent mixing in each of the buildings that form the secondary structure and each floor of the Auxiliary Building. This was assumed in accordance with Standard Review Plan (SRP) Section 6.5.3 and supported by calculation.

⁽¹⁾ J. W. Andersen (USNRC) letter to M. L. Bowling, Jr., "Millstone Nuclear Power Station, Unit No. 3 - Request for Additional Information (TAC No. MA2035)," dated January 25, 1999.

⁽²⁾ R. P. Necci letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - License Amendment Related to the Supplementary Leakage Collection and Release System (PLAR 3-98-5), Response to Request for Additional Information," dated April 5, 1999.

Table 4

**Spray Assumption Comparison
Previous LOCA Submittal Versus Recent Submittal (PLAR 3-98-5)**

Parameter	Previous Submittal	Recent Submittal
Mixing Rate	2 turnovers/hour	4.65 to 13.76 turnovers/hour (time dependent)
Elemental Iodine Spray Duration	7,480 seconds (sprays turned off)	2250 seconds (when a DF of 200 is approached)
Elemental Iodine DF	140	200
Particulate Iodine Spray Duration	7,438 seconds	3,172 seconds (when a DF of 50 is approached)

Question 5

In the markup for Final Safety Analysis Report (FSAR) Table 15.6-9, Insert G, Item 15 lists mixing rates for unsprayed to sprayed regions of the containment. What are the units? How were these mixing rates determined?

Revised Response

The units for mixing rates are 'per hour.' Enclosure 1 provides a discussion of the Stone & Webster methodology employed for the analysis of the containment mixing rate during a design basis LOCA. Stone & Webster considers the material provided in Enclosure 1 to be proprietary information, and requests that it be exempt from public disclosure for commercial reasons.

Enclosure 1

**AFFIDAVIT from Stone & Webster Engineering Corp. to Withhold
Proprietary Information**

and

**ANALYSIS OF CONTAINMENT MIXING RATE DURING A DESIGN BASIS LOCA
by Stone & Webster Engineering Corporation
© Stone & Webster Engineering Corporation, 1999, 2000**



VIA TELECOPY AND NEXT-DAY DELIVERY

Mr. Raymond P. Necci
Vice President – Nuclear Technical Services
Northeast Utilities Service Company
Millstone Nuclear Power Station
P.O. Box 128
Waterford, Connecticut 06385

April 3, 2000

MP-0725
SRE-MP3-0002

**SUBJECT: Request for Withholding from the Public Record
Containment Mixing Model Derivation and Application
MILLSTONE NUCLEAR POWER STATION - UNIT 3**

- References: 1. *Analysis of Containment Mixing Rate During A Design Basis Accident* by Stone & Webster Engineering Corporation.
2. Letter from J.T. Creamer of Stone & Webster to P. L'Heureux of Northeast Utilities Service Co., MP-0707, February 18, 2000.

Dear Mr. Necci:

In order to support an NRC request for additional information, Northeast Utilities requested that Stone & Webster provide a description of the Mixing Model and analysis that was provided for Millstone Unit 3. The description (ref 1) was transmitted to Northeast Utilities by ref 2.

With this letter, Stone & Webster requests that this "description" be withheld from public disclosure in accordance with 10 CFR Part 2, Subpart G, Section 2.790 a (4) and that it be transmitted to the NRC in confidence. We are requesting Northeast Utilities' cooperation in seeking an exemption from public records disclosure for this material, for commercial reasons.

The following information is provided to support classification of ref. 1 as proprietary or privileged commercial as contemplated in the above-noted regulation:

- In ref 2, Stone & Webster stated that the ref.1 document contents cannot be released to third parties without authorization.
- The methodology described in ref. 1 provides the basis for increasing the effectiveness credit for containment spray system in the fission product cleanup function. In very restrictive cases, the model provides the basis for avoiding redesign of the spray system. This makes the Stone & Webster Mixing Model commercially "valuable" to our company.

Stone & Webster Engineers and Constructors, Inc.

245 Summer Street

Boston, Massachusetts 02210

Phone: 617.589.5111

Fax: 617.589.2156

www.stoneweb.com


Request for Withholding

April 3, 2000
MP-0725
SRE-MP3-0002

- This information is not available through public sources.
- The Stone & Webster Mixing Model was developed at an estimated cost to the company of \$250,000.
- The Stone & Webster Mixing Model constitutes a trade secret and an advancement in the state of the art, and therefore provides this company with a competitive advantage in obtaining and performing similar design projects. Making this model available to the public will forfeit this company's hard-earned competitive advantage.

If you have any questions or require any additional information, please contact Frank Elia at 617-589-7225.

Very truly yours,



James T. Callahan
Senior Vice President

cc:	F. Elia	245/6
	J. T. Creamer	245/7
	J. S. Lunde	245/6
	C. Zappile	Chill/30R

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK

**AFFIDAVIT OF JAMES CALLAHAN IN SUPPORT OF APPLICATION FOR WITHHOLDING
PURSUANT TO 10 C.F.R. PART 2, SUBPART G, SECTION 2.790**

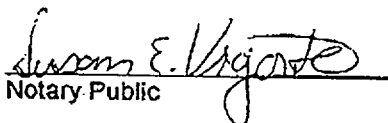
James T. Callahan, being duly sworn, does hereby depose and state:

1. I hold the position of Senior Vice President of Stone & Webster Engineering Corporation, and I am authorized to make the request for withholding accompanying this affidavit.
2. The work underlying the information in question was performed under my authority, and I am responsible for the engineering divisions (s) performing the work.
3. The information that we request be withheld appears in a letter dated February 18, 2000 from Mr. J.T. Creamer of Stone & Webster Engineering Corporation to Mr. P. L'Heureux of Northeast Utilities Service Company (letter number MP-0707). It comprises this company's analysis of containment mixing rate during a design basis accident.
4. The analysis identified above constitutes a novel advance in the state of the art for such analysis, and as such constitutes a source of competitive advantage for our company in the competition and performance of such work in the industry.

Further affiant sayeth not.


James T. Callahan, Senior Vice President
Stone & Webster Engineering Corporation

Signed and sworn before me this 3 day of April, 2000


Notary Public

SUSAN E. VIGORITO
Notary Public
My Commission Expires October 18, 2002