

NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
 WESTERN MASSACHUSETTS ELECTRIC COMPANY
 NEW YORK WATER POWER COMPANY
 NORTHEAST UTILITIES SERVICE COMPANY
 NORTHEAST NUCLEAR ENERGY COMPANY

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April 28, 1992

Docket No. 50-423

B14096

Re: Millstone Unit No. 3
 SER, NUREG-1031

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Steam Generator Tube Rupture (SGTR) Analysis (TAC No. 67054)

In a letter dated October 25, 1985,⁽¹⁾ Northeast Nuclear Energy Company (NNECO) proposed to use the results of the Westinghouse Owners Group (WOG) steam generator tube rupture (SGTR) subgroup generic program to resolve the Millstone Unit No. 3 SGTR licensing issue. The WOG-SGTR subgroup submitted the following documents for NRC review:

- (1) WCAP-10698 (proprietary) and WCAP-10750 (nonproprietary), SGTR Analysis Methodology to Determine the Margin to Steam Generator Overfill, December 1984.
- (2) Supplement 1 to WCAP-10698, Evaluation of Off-site Radiation Doses for an SGTR Accident, May 1985.
- (3) WCAP-11002 (proprietary) and WCAP-11003 (nonproprietary), Evaluation of Steam Generator Overfill due to a SGTR Accident, February 1986.

WCAP-10698 evaluates the margin to overfill for a design basis SGTR. An analysis was performed for the design basis SGTR for the reference plant using the revised methodology, including the improved model, the operator action times, conservative assumptions, and assuming the worst single failure. The results of the analysis presented in WCAP-10698 demonstrate that there is a margin to steam generator overfill for the reference plant. An evaluation was performed to determine the off-site radiation doses for the single failure cases considered in WCAP-10698 and the results are presented in Supplement 1 to WCAP-10698. In WCAP-11002, evaluations of the effects of steam generator overfill as a result of the design basis SGTR on the main steam systems were submitted. It was determined that the potential for water hammer does not

(1) J. F. Opeka letter to B. J. Youngblood, "Steam Generator Tube Rupture (SGTR)," dated October 25, 1985.

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exist in the ruptured steam generator and associated steamline, and the loading on the safety valve will not be excessive during the overfill transient. It was also determined that the off-site radiation doses will only be a small fraction of the 10CFR100 guidelines.

On March 30, 1987,⁽²⁾ the NRC Staff informed the WOG-SGTR subgroup that the NRC had completed its review of the Westinghouse Topical Report WCAP-10698 and found WCAP-10698 acceptable for referencing in license applications. The Staff also required each member of the WOG-SGTR subgroup to submit plant-specific information requested in Section D of Enclosure (1) of the NRC SER.

In a letter dated January 22, 1988,⁽³⁾ NNECO provided responses to five items requested in the NRC's Safety Evaluation for the SGTR issue for Millstone Unit No. 3. Enclosure 1 demonstrated that the margin to overfill for four-loop operation for Millstone Unit No. 3 was greater than that for the reference plant. As a part of the NRC's review of NNECO's evaluation, the Staff requested⁽⁴⁾ that NNECO provide additional information concerning operator response times and effect of steam generator tube uncover during the SGTR event. By letter dated April 6, 1989,⁽⁵⁾ NNECO provided a schedule for collecting the operator response times data through the administration of the Millstone Unit No. 3 Licensed Operator requalification training in calendar years 1989 and 1990. NNECO also indicated that this data was expected to be available in April 1991. The operator action times⁽⁶⁾ for Millstone Unit No. 3 used in the original plant-specific evaluation⁽⁶⁾ were assumed to be the same as the value utilized in the design basis SGTR analysis presented in WCAP-10698. The purpose of this letter is to update that evaluation and submit a plant-specific analysis for four-loop and three-loop operation for Millstone Unit No. 3. An analysis has been performed for a design basis SGTR

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- (2) C. H. Rossi letter to A. Ladieu, Chairman, SGTR Subgroup, "Acceptance for Referencing of Licensing Topical Report WCAP-10698, SGTR Analysis Methodology to Determine the Margin to Overfill," dated March 30, 1987.
 - (3) E. J. Mrocza letter to the U.S. Nuclear Regulatory Commission, "Steam Generator Tube Rupture (SGTR)--Plant Specific Information," dated January 22, 1988.
 - (4) D. H. Jaffe letter to E. J. Mrocza, "Generic Steam Generator Tube Rupture Analysis," dated February 15, 1989.
 - (5) E. J. Mrocza letter to the U.S. Nuclear Regulatory Commission, "Generic Steam Generator Tube Rupture Analysis," dated April 6, 1989.
 - (6) E. J. Mrocza letter to the U.S. Nuclear Regulatory Commission, "Steam Generator Tube Rupture (SGTR)--Plant Specific Information," dated January 22, 1988.

event for four-loop operation for Millstone Unit No. 3 to demonstrate margin to overfill assuming the limiting single failure relative to overfill. WCAP-13002, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Nuclear Power Station, Unit No. 3 Four Loop Operation" (proprietary), provides the details and the results of the analysis. In addition, a design basis SGTR analysis was performed for three-loop operation for Millstone Unit No. 3 and the results of the analysis are included in WCAP-13056, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Nuclear Power Station, Unit 3--Three Loop Operation" (proprietary). The operator response times used for the SGTR analysis for both four-loop and three-loop operation are based on the results of simulator studies of the SGTR recovery operations which were performed by the Millstone Unit No. 3 operations personnel using the plant training simulator. Table 1 provides a comparison of operator response data with the assumptions in the Westinghouse generic analysis (WCAP-10698).

With respect to Item 2 of the NRC's February 15, 1989,⁽⁷⁾ letter requesting additional information in July 1988, the WOG initiated a program to evaluate the effect of steam generator tube uncover on radioactive release on a generic basis. On March 29, 1989, the WOG Analysis Subcommittee briefed the NRC on the status of the program to address the steam generator tube uncover issue. The WOG recently completed a generic evaluation of the potential impact on the radioactivity release to the environment during a SGTR when the rupture site is not covered by water. The evaluation concludes that steam generator tube bundle uncover does not significantly increase the radiological consequences associated with the limiting SGTR accident. In a letter dated March 31, 1992,⁽⁸⁾ the WOG presented to the NRC a summary of the WOG steam generator tube uncover program and requested NRC action to close the steam generator tube uncover issue. The information presented includes a history of the WOG program, a summary of the program results as presented to the NRC Staff at the January 31, 1991, meeting and the WOG conclusions from the program. Also included was a copy of WCAP-13247, "Report on the Methodology for the Resolution of the Steam Generator Tube Uncover Issue" (proprietary). As you know, NNECO is a member of the WOG and has actively participated in this program. NNECO will take the necessary actions to conform with the WOG/NRC agreed upon resolutions of this issue.

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- (7) D. H. Jaffe letter to E. J. Mrocza, "Generic Steam Generator Tube Rupture Analysis," dated February 15, 1989.
- (8) L. A. Walsh, Chairman, Westinghouse Owners Group letter to R. C. Jones of NRC, "Westinghouse Owners Group, Steam Generator Tube Uncover Issue," dated March 31, 1992.

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As stated above, NNECO has completed a design basis SGTR analysis for four-loop and three-loop operation for Millstone Unit No. 3. NNECO hereby submits:

1. Five copies of WCAP-13002, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Unit 3--Four-Loop Operation," (Proprietary).
2. Five copies of WCAP-13003, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Unit 3--Four-Loop Operation," (Nonproprietary).
3. Five copies of WCAP-13056, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Unit 3--Three-Loop Operation," (Proprietary).
4. Five copies of WCAP-13057, "Margin to Overfill Analysis for a Steam Generator Tube Rupture for Millstone Unit 3--Three Loop Operation," (Nonproprietary).

Also enclosed are Westinghouse authorization letters CAW-91-202, CAW-91-216, and accompanying affidavits, Proprietary Information Notices, and Copyright Notices.


Since items 1 and 3 contain information proprietary to Westinghouse Electric Corporation, they are supported by affidavits signed by Westinghouse, the owner of the information. The affidavits set forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.790 of the Commission's regulations.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the supporting Westinghouse Affidavit should reference CAW-91-202 and/or CAW-91-216 and should be addressed to R. P. DiPiazza, Manager of Operating Plant Licensing Support, Westinghouse Electric Corporation, P. O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

If you have any questions regarding this matter, please contact our licensing representative directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



J. F. Opeka
Executive Vice President

cc: See Page 5

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cc: T. T. Martin, Region I Administrator
v. L. Rooney, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2,
and 3

Table 1

Operator Action Times for Plant-Specific Analysis
 (WCAP-13002) vs. Operator Response Times assumed in the Westinghouse
 Generic Analysis (WCAP-10698)

<u>Action</u>	Time (Min.) ⁽¹⁾ <u>WCAP 13002</u>	Time (Min.) <u>WCAP-10698</u>
Identify and isolate ruptured steam generator	16.5 min. or Calculated time to reach 58% wide-range level in the ruptured SG, whichever is longer	Maximum of 10 min. or calculated time to reach 33% narrow-range level in the rupture SG
Operator action time to initiate cooldown	8 min. from isolation	5 min. from isolation
Cooldown	Calculated time for cooldown	2 min. from end of cooldown
Operator action time to initiate depressurization	3 min. from end of cooldown	Calculated time for cooldown
Depressurization	Calculated Time for RCS depressurization	Calculated Time for RCS depressurization
Operator action time to initiate SI termination	3 min. from end of depressurization	1 min. from end of of depressurization
SI termination and pressure equalization	Calculated time for SI termination and equalization of RCS and ruptured SG pressures	Calculated time for SI termination and equalization of RCS and ruptured SG pressures

Note (1): Each individual operator action time derived from arithmetic mean of all crews, operators and staff. The above data collection involved 17 simulation runs with 11 of 12 Millstone Unit No. 3 crews of licensed personnel.