NORTHEAST UTILITIES

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

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 666-6911

June 25, 1984

Docket No. 50-336
A03985

Director of Nuclear Reactor Regulation
Attn: Mr. James R. Miller
Operating Reactors Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) W. G. Counsil letter to R. A. Clark, dated September 2, 1983.

(2) J. R. Miller letter to W. G. Counsil, dated April 20, 1984.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Additional Information Regarding Steam Generator Tube Inspections

By Reference (1), Northeast Nuclear Energy Company (NNECO) requested an amendment to the Millstone Unit No. 2 Technical Specifications concerning steam generator tube inservice inspections. The attached information is provided in response to the comments and questions forwarded to us in Reference (2). Attachment 1 responds to the information requested in Items 1 and 2 of Reference (2). Attachment 2 provides alternate language for the Technical Specifications proposed in Reference (1) and replaces Attachment 1 to Reference (1) in its entirety.

We trust you find the attached information satisfactory. My staff remains available to assist you in this matter.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Senior Vice President

A047
1/1

Docket No. 50-336

Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Additional Information

Steam Generator Tube Inspection

June, 1984

Northeast Nuclear Energy Company recognizes that tubes blocked to the automatic test equipment can typically be inspected manually. All tubes can be inspected manually, however equipment was developed to automatically and remotely perform the inspections of steam generator tubes to avoid the personnel radiation exposure involved with the inspections. The radiation levels present in the steam generators at Millstone Unit No. 2 typically result in an exposure of 0.3 - 0.5 person-rem for each steam generator tube end which is manually inspected. NNECO considers such exposures unjustified for those tubes for which a high level of confidence exists regarding their integrity.

The only tubes to be exempted from inspection shall be those tubes that are located more than five (5) lines and eight (8) rows from any flawed tube. This criterion assures that as many as 92 tubes free of flaws will surround a tube proposed to be deleted from the inspection pattern. Experience at Millstone Unit No. 2 has demonstrated that steam generator tube defects tend to be localized and readily grouped into patterns. As such, the criterion outlined above provides an appropriate basis on which to draw conclusions regarding the integrity of an uninspected steam generator tube.

Steam generator tubes which are scheduled for inspection but are deleted from the inspection pattern are listed. The record of these tubes is then introduced into the plant inspection and work control system. This system has been utilized in the past to ensure a followup inspection of steam generator tubes. Specifically, during the Cycle 5 refueling outage, steam generator tube degradation was identified which required a 100% inspection in accordance with Category C-3 of Technical Specification 4.4.5.1.2.c. During the inspection, 54 tubes in an area of the tube bundle scheduled for inspection were inaccessible to the automatic testing equipment without extensive modifications to the equipment which would have necessitated additional personnel radiation exposure.(1) It was mutually agreed to by our staffs that NNECO would inspect 22 of these tubes during the next outage.(2) These tubes were entered into the plant inspection and work control system which ensured that appropriate personnel responsible for inspection remained cognizant of the need to inspect these specific tubes during the subsequent outage.

Steam generator tube inspections are planned in advance in accordance with the requirements of the technical specifications. The specific tubes to be inspected are chosen from areas of the tube bundle where defects have historically been identified and include the tubes which had detectable wall penetration and were not plugged. This is required by Technical Specification 4.4.5.1.2.b.

As part of the inspection process, a full size, numbered template is fabricated. The templates are installed on the tube sheet face prior to beginning the inspection. The template defines the tubes to be inspected. It is secured in place with plugs which are installed into certain steam generator tubes. Proper positioning of the template is verified by identification of specific 'landmarks' on the tubesheet.

The examiner or equipment technician who positions the inspection probe carrier views the position on closed circuit television. The line and row numbers on the template identify the tube end being entered. This individual initials the data sheet indicating he has verified the location of the tube inspected.

Each location of a defect is independently verified by a second examination of the suspect tube. This verification identifies that the flaw "signature" seen on the original examination is, in fact, present at the line/row originally identified. Discrepancies, if any, are resolved by identifying the extent of the inspection which is suspect and reexamining all tubes suspected of improper identification.

All inspection work is performed in accordance with station procedures for Quality Assurance (QA) work and is subject to audit, surveillance and monitoring by QA personnel.

Future advances in automated tooling hold the promise of eliminating the need for the tubesheet templates. Micro-processor controlled positioners should result in reduced personnel radiation exposure and increased assurance of accurate inspection location.

(1) W. G. Counsil letter to R. A. Clark, dated February 12, 1982.
(2) E. L. Conner letter to W. G. Counsil, dated March 5, 1982.

Docket No. 50-336

Attachment 2

Millstone Nuclear Power Station, Unit No. 2

Proposed Rewording of Technical

Specification Change Request

June, 1984

TABLE 4.4-5

MINIMUM NUMBER OF STEAM GENERATORS TO BE
INSPECTED DURING INSERVICE INSPECTION

Preservice Inspection	Yes
No. of Steam Generators per Unit	Two
First Inservice Inspection	One
Second & Subsequent Inservice Inspections	One[1]

Table Notation:

1. The inservice inspection may be limited to one steam generator on a rotating schedule encompassing 3 N % of the tubes (where N is the number of steam generators in the plant) if the results of the first or previous inspections indicate that all steam generators are performing in a like manner. Note that under some circumstances, the operating conditions in one or more steam generators may be found to be more severe than those in other steam generators. Under such circumstances the sample sequence shall be modified to inspect the most severe conditions.

MILLSTONE - UNIT 2

3/4 4-7d

TABLE 4.4-G

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S. G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Repair defective tubes and inspect additonal [illegible] tubes in this [illegible]	C-1	None	N/A	N/A
			C-2	Repair defective tubes and inspect additional 4S tubes in this S.G.	C-1	None
					C-2	Repair defective tubes
					C-3	Perform action for C-3 result of first sample
			C-3	Perform action for C-3 result of first sample	N/A	N/A
	C-3	Inspect all tubes in this S. G., repair defective tubes and inspect 2S tubes in each other S.G.* See Note 1. Prompt notification to NRC pursuant to specification 6.9.1	All other S. G.s are C-1	None	N/A	N/A
			Some S. G.s C-2 but no additional S. G. are C-3	Perform action for C-2 result of second sample	N/A	N/A
			Additional S. G. is C-3	Inspect all tubes in each S.G and repair defective tubes*. Prompt notification to NRC pursuant to Specification 6.9.1. See Note 1.	N/A	N/A

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

*Repair of defective tubes shall be limited to plugging with the exception of those tubes which may be sleeved. Tubes with defective sleeves shall be plugged.

Table 4.4-6
Table Notation

1. Tubes required to be inspected pursuant to Action C-3 which are blocked by the remote inspection equipment may be excluded from the inspection pattern performed pursuant to Action C-3 provided that no tube within 5 lines or 8 rows is degraded. No more than 0.5 percent of all tubes in the steam generator shall fall into this category.