

# NORTHEAST UTILITIES



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

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September 21, 1984

Docket No. 50-423  
B11318

Director of Nuclear Reactor Regulations  
Mr. B. J. Youngblood, Chief  
Licensing Branch No. 1  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3  
Safety Related Instrument Tubing Program

Representative from Northeast Nuclear Energy Company (NNECO) and Stone & Webster met with the staff of NRC-Mechanical Engineering Branch on September 12, 1984 to discuss a proposed program for safety related instrument tubing for Millstone 3. The proposed program presented at the meeting by NNECO applies to ASME section III, Class 2 and Class 3 instrument lines from downstream of the ASME III socket weld on the root valve up to and including the last valve of the instrument. The tubing used is one-half inch or less in diameter. The instrument line from the root valve socket weld to the process line remains part of the ASME III program. The brief summary of the program as presented at the meeting is provided in attachment I. The proposed program outlined in Attachment I will allow us to eliminate the N-5 data package requirement for instrument tubing resulting in scheduler and economic benefits without impacting the safety of the plant. In addition, maintenance and administrative requirements for the plant over its 40 year life will be greatly enhanced as a result of the change from an ASME III to a Category I program. In summary, NNECO considers that changing the instrument tubing program from ASME III to Category I will not degrade the quality or impact the safety of the tubing installation.

In order to realize the benefits outlined in attachment I, NNECO requests the NRC to review and approve the safety related instrument tubing program by October 5, 1984. We remain available to meet with the staff to resolve any questions which may arise and provide any information necessary to implement this request promptly.

Attachment II delineates the proposed FSAR change to reflect the proposed program. This FSAR change will be incorporated into a future amendment to the FSAR.

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Attachment I

Safety Related Instrument Tubing Program

## Safety Related Instrument Tubing Program

Millstone Unit 3 instrumentation tubing design presently specifies that all tubing classified as either Class 2 or Class 3 be installed in accordance with the requirements of ASME Section III Class 2 and 3. This installation included ANI inspections, N-5 documentation packages and procurement of all material and components within the system from ASME approved suppliers.

Due to recently identified implementation problems, Northeast Nuclear Energy Company is proposing to modify the existing instrumentation tubing program while still achieving the same level of quality and reliability of the instrumentation system. The differences between the present program and the proposed program are outlined in Attachment II.

We are proposing to limit the application of this program to one half-inch and less outside diameter tubing designated as Class 2 and 3. The only tubing larger than one half inch is the three quarter inch tubing which connects certain airborne radiation monitors to non-ASME III ductwork. Additionally we are preparing to include the three quarter inch tubing used in the containment airborne radiation monitoring system in this program.

These monitors are located external to the containment and are designed to monitor airborne radioactivity during normal operation only. The primary purpose of these monitors is to detect primary leakage and no credit is taken during post accident condition. These monitors are automatically isolated in accordance with General Design Criteria 56, item (4) via containment isolation signal and will not be exposed to elevated pressures at any time. The three quarter inch tubing from the containment ductwork to the containment boundary and all tubing outside the containment will be included within this proposed program (see attached FSK 33-2).

This expansion of our proposed program for tubing larger than one-half inch will be limited to systems where normal operating pressure is less than 50 psig which do not interface with any ASME III systems.

For tubing which serves a non-safety related function attached to a Category I process pipe, functional capability is not required, therefore the allowable stress values for ASME equation 9 utilize the faulted allowable of  $2.4 S_h$  for all loading conditions. The faulted allowable for this tubing will ensure that the pressure boundary is maintained, thereby protecting the safety related function of the process piping.

The proposed program will be implemented from downstream of the ASME III socket weld on the root valve up to and including the last valve of the instrument.

In summary the proposed program assures that the same degree of quality is maintained for instrumentation tubing which will be designed and constructed in accordance with 10 CFR 50, Appendix B. Additional quality of all compression fittings will be assured by the use of specially developed tools and gauges which will facilitate inspection of these fittings throughout the life of the plant.





Attachment II

Proposed FSAR Changes

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TABLE 1.8-1 (Cont)

R.G. No.	Title	Degree of Compliance	FSAR Section Reference
1.26*	Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants (Rev. 3, February 1976)	Comply, with the following exceptions: <ol style="list-style-type: none"> <li>1. The safety class terminology of ANSI N18.2 and ANSI N18.2-a, 1975 is used instead of the quality group terminology. Thus, the terms Safety Class 1, Safety Class 2, Safety Class 3, and non-nuclear safety (NNS) are used instead of Quality Groups A, B, C, and D, respectively.</li> <li>2. Regarding Regulatory Positions C.1.e and C.2.c, one safety valve designed, manufactured, and tested in accordance with ASME III Division 1 (i.e. a code safety valve) is considered acceptable as the boundary between the reactor coolant pressure boundary and a lower safety class or NNS line.</li> </ol>	3.2.2
1.27	Ultimate Heat Sink for Nuclear Power Plants (Rev. 2, January 1976)	Comply → INSERT A'	2.4.11.6 9.2.5
1.28*	Quality Assurance Program Requirements (Design and Construction) (Rev. 2, February, 1979)***	Comply as follows: <ol style="list-style-type: none"> <li>1. <u>Construction</u> Millstone 3 complies with Regulatory Guide 1.28, Rev. 0.</li> <li>2. <u>Operation</u> Millstone 3 complies with Regulatory Guide 1.28, Rev 2.</li> </ol>	17.1.2 17.2
1.29*	Seismic Design Classification (Rev. 3, September 1978)	Comply	3.2.1
1.30	Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment (Rev. 0, August 11, 1972)	Comply	17.1.2 17.2
1.31*	Control of Ferrite Content in Stainless Steel Weld Metal (Rev. 2, May 1977)**	Comply, with the following clarification: The control of ferrite content in stainless steel weld metal will meet the requirements of Regulatory Guide 1.31, Rev. 1, dated	4.5.1    5.3.1.4 4.5.2.4    6.1.1.1 5.2.3.4    10.3.6.2

Add Insert 'A' to Table 1.8-1 Page 8 of 58

INSERT 'A'

3. Regarding Regulatory Positions C.1 and C.2, all instrument tubing, classified as Safety Class 2 or 3, are designed to ASME Section III rules, with Seismic Category I supports installed with a 10 CFR 50 Appendix B program as described in Section 3.2.3.



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reactor coolant pressure boundary and a lower safety class or NNS line.

Millstone 3 has constructed components in systems <sup>safety related</sup> important to safety to the ASME Boiler and Pressure Vessel Code, Section III, "Nuclear Power Plant Components," Division I, as follows: ✓S

1. Quality Group A (Section III, Class 1) components within the reactor coolant pressure boundary comply with Section 50.55a, 10CFR50
2. Quality Group B (Section III, Class 2) components comply with the requirements of Subsection NA-2130 of the code
3. Quality Group C (Section III, Class 3) components comply with the requirements of Subsection NA-2130 of the code

→ INSERT 'B'  
The safety classes of safety related fluid systems are given in Table 3.2-1. In addition, the safety class boundaries are shown on the various piping and instrumentation diagrams (P&ID) located throughout this safety analysis report. The following line designations are used on P&IDs to indicate these boundaries:

Safety Class 1, SC-1 (Quality Group A) = line designator, - 1  
Safety Class 2, SC-2 (Quality Group B) = line designator, - 2  
Safety Class 3, SC-3 (Quality Group C) = line designator, - 3  
Non nuclear Safety Class, NNS (Quality Group D) = line designator - 4  
As required by 10CFR 50, App A, safety class boundaries only change at the isolation valves.

Line designator and safety class boundaries are illustrated on Figure 3.2-1. The method of identification of nuclear safety related flow paths, equipment and instrumentation is shown on Figure 3.2-2.

Safety class boundaries on FSAR figures (P&ID) are extended to the first piping restraint beyond the indicated boundary.

### 3.2.3 Quality Assurance Categories

The contents of this section can be found in the Millstone 3 Quality Assurance Program Manual Appendix III which has been derived without degradation from the Stone & Webster Engineering Corporation Topical Report SWSQAP 1-74A, Rev. NA.

Table 3.2-1 lists Millstone 3 structures, systems, and components which are classified QA Category I.

### 3.2.4 Other Classification Systems

#### Tornado Design Classification

Add Insert 'B' to FSAR Page 3.2-5

INSERT 'B'

The boundary of jurisdiction of ASME Code Section III, Class 2 and 3 process piping extends to and includes the root valve. The appropriate safety class extends from the root valve to the sensing instrument. Seismic Category I supports are employed for Safety Class 2 and 3 instrument tubing. The tubing used is one half inch or less in diameter. The requirements for Safety Class 2 and 3 instrument tubing are listed in Tables 3.2-2, 3.2-3, and 3.2-4.

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Table 3.2-2

Safety Class 2 and 3  
Instrument Tubing Requirements

	ASME III (All Ref. Summer 1973)	PROPOSED CATEGORY I PROGRAM
Organization	Required	Same
Training	Required	Same
Design Specification	Pressure boundary Integrity for SSE and dead loads, thermal	Same, except for code references to certification in spec. (Note 1)
Engineering, Design, and Document Control	Category I	Same
Procurement Control	ASME-approved suppliers	ASME III Design and Material, Cat I supplier, no N-stamp required
Receiving, Inspection, Identification, Storage, and Handling Control	Physical Inspection and review of documentation, ANSI storage and material identification	Same
Fabrication and Installation Control	Control Drawing Package, FQC, and ANI review and established holdpoints, material traceability	Same, Except no mandatory holdpoints; no third party documentation review; no individual packages per drawing; normal Category I IR System. (Tables 3.2-3 and 3.2-4)
Field Welding and Brazing Control	ASME III Procedures - Weld data package each weld; ASME IX welders (Note 2)	Same (Table 3.2-4)
Bolted and Other Mechanical Joints	Data sheet for special bolted joints	No special bolted joints; mechanical fittings installed to MFG. requirements, documented on Inspection Reports

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Table 3.2-2

Safety Class 2 and 3  
Instrument Tubing Requirements

	ASME III (All Ref. Summer 1973)	PROPOSED CATEGORY I PROGRAM
Heat Treatment and Special Operations and Repairs	Not Applicable	Same
Fabrication and Installation Inspection	FQC, ANI, ASME acceptance, material traceability required of selected components to specific point of installation	Same, except limited third party surveillance; Category I material marking or exclusive purchase of Category I material. (Tables 3.2-3 and 3.2-4).
Nondestructive Testing	Dye penetrant for Class 2, visual for Class 3, traceability (Note 2)	Same
Nonconformances	N&D	Same
Control of Measuring and Test Equipment	Required	Same
Authorized Nuclear Inspector and Code Certification	N-stamp	Not Applicable
Quality Assurance Audit Program	SWEC, ASME, ANI, NUSCO	SWEC, NUSCO
Company Quality Assurance and Control Manual	SWEC QA Program Manual SWEC ASME III Control Manual	SWEC QA Program Manual
Final Documentation	As-built data package FQC-ANI Certification	Documented on Inspection Reports, FQC acceptance

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Table 3.2-2

Safety Class 2 and 3  
Instrument Tubing Requirements

	ASME III (All Ref. Summer 1973)	PROPOSED CATEGORY I PROGRAM
Certificate Holder (Installation Subcontractor)	Not Applicable	Same
Pressure Testing	1.25 times design pressure FQC/ANI to witness	Same, FQC witness
SWEC's Responsibilities When Owner's Designee	Prepare code data forms, N5, N3, ANI Witness N-stamp	Not Applicable
SWEC Operations Under the ASME Section XI	Governs repair of components	Not Applicable

Notes

- (1) For tubing which serves a non-safety related function attached to a Category I process pipe, functional capability is not required, therefore the allowable stress values for ASME equation 9 utilize the faulted allowable of  $2.4 S_h$  for all loading conditions. The faulted allowable for this tubing will ensure that the pressure boundary is maintained, thereby protecting the safety related function of the process piping.
- (2) Compression fittings are used exclusively for Tubing Installation except where transition from pipe to tubing is required.



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Table 3.2-3

Instrument Tubing  
Examination and Testing Program

- A. Safety Class 2 and 3, Socket and Butt Welds
  - 1. 100% visual inspection by the construction department prior to release to Field Quality Control (FQC) - (document via construction checklist).
  - 2. 100% FQC inspection using ASME III NDE procedures - (document via IR).
  - 3. Third party inspector (ANI) witness NDE, percentage as determined by ANI.
  - 4. In-process surveillance inspections performed by FQC - (document via IR).
  - 5. 100% pressure tested per ASME III pressure test requirements with 100% visual inspection of welds - (document via Pressure Test Report).
  
- B. Safety Class 2 and 3 Compression Fittings
  - 1. 100% inspection of fitting make-up by construction prior to release to FQC using vendor's recommended practices and inspection tools - (document via construction checklist).
  - 2. 100% inspection of fitting make-up by FQC using vendor's recommended practices and inspection tools - (document via IR).
  - 3. In-process surveillance inspections performed by FQC - (document via IR).
  - 4. 100% pressure tested per ASME III pressure test requirements with 100% visual inspection of fittings - (document via Pressure Test Report).

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Table 3.2-4

Comparison of Proposed Tubing Examination and Testing  
With ASME III Requirements

<u>ASME PROGRAM CLASS 2/3</u>	<u>PROPOSE EXAM/TESTING PROGRAM</u>
I. 100 percent visual inspection	I. Same
*II. 100 percent LP inspection	*II. Same
III. Surveillance by ASME and ANI Approximately 10 percent in process activities	III. Surveillance by a third party inspector approximately 10 percent inprocess activities - includes welding and weld hydros.
IV. Hydro - 100 percent inspection by FQC and ANI at 1.25 times design pressure	IV. Hydro - 100 percent inspection by FQC at 1.25 times design pressure
V. Surveillance inspection performed by FQC, i.e., Inprocess Welding, Weld Material Control, Material Control	V. Same
VI. All inspection performed, with the exception of Item V, are documented in the weld data packages, i.e., Weld Data Sheets	VI. Same
VII. Welders and procedures to be qualified to ASME IX	VII. Same

\*Note: For Class 3, LP is not required by ASME III.