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 8, 1983
Docket No. 50-423
B10885

Dr. Thomas E. Murley, Regional Administrator
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Reference: (1) W. G. Counsil letter to J. M. Allar, Millstone Nuclear Power Station, Unit No. 3, Reporting of Potential Significant Deficiencies in Design and Construction: Main Control Board Welds (SD-36), dated May 13, 1983.

Dear Dr. Murley:

Millstone Nuclear Power Station, Unit No. 3,
Reporting of Potential Significant Deficiencies
in Design and Construction: Main Control Board Welds (SD-36)

In Reference (1), Northeast Nuclear Energy Company (NNECO) reported a potential significant deficiency as required by 10CFR50.55(e) involving inadequate welds on main control board panels supplied by Reliance Electric Company.

On May 17, 1983, Reliance Electric Company with the assistance of Stone & Webster implemented an inspection and repair program for all boards supplied by Reliance. Unacceptable welds as identified by Reliance were listed in two categories. The first category included welds requiring rework and the second was for welds requiring analysis to determine if they possess sufficient structural integrity to survive a design basis earthquake. The following is a listing of the two groups.

Main Control Board

Repair - 200
Analysis - 234

Primary Relay Board

Repair - 2
Analysis - 24

Termination Cabinets

Repair - 21
Analysis - 114

IE27

An agreement was made between Stone & Webster Engineering Corporation and Reliance Electric Company to use Stone & Webster welding procedures to perform field repairs on the control board panels. The Reliance Q.A. Manual was revised to include the necessary field repair work. This revised Q. A. document became a controlled document on file at Stone & Webster in Boston.

Attachment 1 contains the justification for inspection of painted welds. Reliance stated that throughout their inspections of suspect welding, the deficiency discovered with welding involved dimensional problems, i.e., welds which were undersize, concave, or not filled out. Attachments 2 & 3 address inspection of inaccessible weld areas.

All welds requiring repair have been completed by Stone & Webster and accepted by Reliance and Stone & Webster Q. A. All welds requiring analysis have been analyzed by Reliance and approved by Stone & Webster and Northeast Utilities Service Company (NUSCO) as having sufficient structural integrity to withstand a design basis earthquake.

NNECO considers these corrective actions sufficient to resolve this deficiency. As such, this letter constitutes our final report closing out all items related to SD-36. We trust the above information satisfactorily addresses your concerns. Please feel free to contact my staff if you have any further questions.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Senior Vice President

ATTACHMENT 1

RELIANCE ELECTRIC

Reliance Electric
4900 Lewis Rd.
Stone Mountain, GA 30083
(404) 938-4888

INSPECTION OF PAINTED WELDS

When the weld problem was first discovered, we had several control boards in our shop which were already painted. We performed an inspection of 100% of the welds (4500 welds) with the paint on. One of the panels was chosen to be subjected to an additional sample inspection. The number of welds in the lot size were 4000. Five hundred painted welds had already been identified as needing repair. We chose a random sample of 315 welds. This corresponds to an Inspection Level III of MIL-STD-105D, which is single sampling for tightened inspection. The 315 welds were wire brushed to remove all paint. Of the 315 welds, three butt welds were found to have a slight concavity. All of the fillets were good. MIL-STD-105D shows that the panel would be accepted based on the sample inspection. For the Millstone III boards, this translates into an 0.065 AQL, which means that 195 defective welds (6.5 per 1000) could remain undetected (based on an estimated 30,000 welds in the Main Control Board, panels 1-8). These findings adequately support our proposal for inspecting the welds in the other sections with the paint on. We have used this approach with GA Power, FL Power & Light, LA Power & Light, LILCO and Texas Utilities; all of which were built in the same time period as the Millstone boards. The inspector qualifications for the sample inspection are the same as those being used in the control boards for Millstone III.

Richard Morrow

Richard Morrow, Q.A. Manager
Custom Panels Division

SWEC, Agents for
Northeast Utilities
Millstone Unit 3
P.O. 2424-100-245
Name Main Control Boards
Mark No. 3CES*MCB 5,6,7
Mfg. Reliance Electric Co.
4900 Lewis Rd. St. Mtn. Ga.
JO 12179

ATTACHMENT 2

RELIANCE ELECTRIC

INACCESSIBLE AREAS FOR WELDING INSPECTION

The areas in the Main Control Boards which are not accessible for weld inspection are those vertical surfaces covered by subpanels and wireways. The accessible vertical areas were surveyed in order to establish the relationship between the vertical areas and the good/bad welds. The type of weld hidden behind the subpanels and wireways is the fillet described by our drawing WS-1-NU-C (SWEC welding tech sheet W70G).

A summary of the survey follows:

MCB No.	Total Accessible Vert. Area (Sq Ft)	Total No. of Welds	Total Defective Welds	Total Area Inaccessible (Sq Ft)
MB1, 2	224	428	4	49
MB3	122	238	11	32
MB4	110	279	5	95
MB5,6,7	219	447	2	79
MB8	147	378	4	28
TOTALS	822	1770	26	283

The projection for the inaccessible areas follows:

MCB No.	Defects per Square Foot	Total Area Inaccessible	Expected No. Of Defects
MB1,2	.018	49	1
MB3	.090	32	3
MB4	.046	95	5
MB5,6,7	.009	79	1
MB8	.027	28	1

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MB 1 & 2 INACCESSIBLE AREAS FOR WELD INSPECTION

There is a total Of 273 square feet of vertical surface in this section, of which 49 square feet is not accessible for weld inspection.

Of the 428 welds inspected on these vertical surfaces, the following were found to be defective:

Weld No.	Defect Description
145-A	WS-1-NU-C,W70G. Weld is 1 3/4" long. It has 1/8" of overlap at each end. The required length is 1".
130-A	WS-1-NU-C, W70G. Tack weld (1/4" long) is between two fillet welds of proper size, length & spacing.
125-A	WS-1-NU-C, W70G. The 2" fillet has a small hole in one end (1/32" dia). AWS D1.1 allows more porosity than is present.
123-R	WS-1-NU-C, W70G. Excessive porosity was removed by grinding. Rewelding was not necessary.

MB3

There is a total of 154 square feet of vertical surface in this section, of which 32 square feet is not accessible for weld inspection.

Of the 238 welds inspected on the vertical surfaces, the following were found to be defective:

Weld No.	Defect Description
100-R	WS-1-NU-C, W70G. Incomplete fusion.
102-R	WS-1-NU-C, W70G. Incomplete fusion.
104-R	WS-1-NU-C, W70G. Incomplete fusion.
110-R	WS-1-NU-C, W70G. Incomplete fusion.
103-R	WS-1-NU-C, W70G. Incomplete fusion. The repair did not include welding.
105-R	WS-1-NU-C, W70G. Incomplete fusion.
115-R	WS-1-NU-C, W70G. Incomplete fusion. The repair did not include welding.
118-R	WS-1-NU-C, W70G. Incomplete fusion.
117-R	WS-1-NU-C, W70G. Incomplete fusion.
116-R	WS-1-NU-C, W70G. Incomplete fusion.
132-R	WS-1-NU-C, W70G. Incomplete fusion. The repair did not include welding.

SWEC, agents for
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Millstone Unit 3
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Mfg. Reliance Electric C
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JO 12179

SWEC, agents for
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Millstone Unit 3
P.O. 2424.100-245
Name Main Control Boards
Mark No 3CES* MCB 5,6,7
Mfg. Reliance Electric Co.
4900 Lewis Rd. St. Mtn. Ga.
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MB4

There is a total of 205 square feet of vertical surface in this section, of which 95 square feet is not accessible for weld inspection.

Of the 279 welds inspected on the vertical surfaces, the following were found to be defective:

Weld No.	Defect Description
060-A	WS-1-NU-C, W70G. Incomplete fusion on the last 1/4" of the 2 1/2" long weld. The weld length minimum length is 1 inch.
055-R	WS-1-NU-C, W70G. Incomplete fusion. The repair did not include welding.
061-R	WS-1-NU-C, W70G. Incomplete fusion. The repair did not include welding.
063-R	WS-1-NU-C, W70G. Incomplete fusion.
064-A	WS-1-NU-C, W70G. A tack weld was left between two welds of adequate size, length & spacing.

MB5, 6 & 7

There is a total of 298 square feet of vertical surface in this section, of which 79 square feet is not accessible for weld inspection.

Of the 447 welds inspected on these vertical surfaces, the following were found to be defective:

Weld No.	Defect Description
6-204A	WS-1-NU-C, W70G. Incomplete fusion.
5-214R	WS-1-NU-C, W70G. Two fillets 3/16" x 1" are missing.

MB8

There is a total of 175 square feet of vertical surface in this section, of which 28 square feet is not accessible for weld inspection.

Of the 378 welds inspected on these vertical surfaces, the following were found to be defective:

Weld No.	Defect Description
265-R	WS-1-NU-C, W70G. Incomplete fusion.
264-R	WS-1-NU-C, W70G. 3/16" x 1" fillet missing.
202-A	WS-1-NU-C, W70G. Fillet size 1/8" rather than 3/16"
203-A	WS-1-NU-C, W70G. Fillet size 1/8" rather than 3/16"

When we complete the inspection of the other sections of the Main Control Boards, we will determine a percentage of defects which will be applied to the inaccessible areas. This percentage will include an appropriate safety factor. Analysis will then be used to determine acceptability of the inaccessible areas.

Richard Morrow

Richard Morrow, Q.A. Manager
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ATTACHMENT 3

TELECOPY # 11132-83XF
DATE 7-13-83

RELIANCE ELECTRIC

JULY 13, 1983

Stone & Webster Engineering Corp.
c/o Northeast Utilities
Millstone III
P. O. Box 345
Waterford, CT 06385

Attention: Mr. George Butler

Subject: P.O. 2424.200-243
Reliance Electric S.O. 99AX400489
Welding Nonconformances

Dear MR. Butler:

During our inspection of the Main Control Boards, it was determined that the weld areas that were inaccessible were predominantly in the rear of the boards frequently covered by the sub-panels and the wireways. The type of weld hidden behind these obstructions is the fillet weld joining the stiffener(s) to the panel skin and fully described in our drawing No. WS-1-NU-C. The inspection of these typical joints revealed that the welds are oversized (1/4" rather than 1/8") and longer in length (1 1/2" to 2" rather than 1") than the minimum inspection requirements.

The analytical evaluation of these welds was done using both the 1/4" and the 1/8" fillet size, and in all but one instance, the 1/8" size welds analyzed, possessed sufficient margins of safety under the design basis loading condition. The 1/8" size weld judged to be inadequate was only .975" long compared to the minimum requirement of one inch length (weld anomaly number 007A MB-1).

As such, if fifty percent of the weld area of a 1/4" size fillet weld is missing, or every other weld is bad, the remaining welds would still possess sufficient structural integrity under the worst case seismic loading condition.

Our inspection of the main boards also revealed that most of these defects were randomly spread out throughout the control board and additionally no two, one hundred percent rejectable welds were found side by side. Based on our previously submitted statistical evaluation on the expected number of defects, and the above described evaluation, Reliance feels that there are not any significant number of inaccessible weld defects that would compromise the safety and performance of the boards.

Should there by any questions, please contact the undersigned.

Sincerely,

V. Bhandari

Vijay Bhandari
NBQ Manager

VB/bb

cc: D. Roy/RENP; [illegible]; J. Walsh; [illegible]/RMC 936 4838

GENERAL OFFICES / CLEVELAND, OHIO