

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-322/82-19

Docket No. 50-322

License No. CPPR-95 Priority -- Category B

Licensee: Long Island Lighting Company

175 East Old Country Road

Hicksville, New York 11801

Facility Name: Shoreham Nuclear Power Station

Inspection At: Shoreham, New York

Inspection Conducted: July 19 - August 13, 1982

Inspectors: Harry W. Kerch  
Harry W. Kerch  
Mechanical Engineer (NDE)

9/16/82  
date

Richard H. Harris  
Richard H. Harris  
Engineering Technician

9/16/82  
date

Approved By: J.P. Decker  
Chief, Materials & Processes Section

9/19/82  
date

Inspection Summary:

Inspection on July 19 - August 13, 1982 (Report No. 50-322/82-19)

Areas Inspected: A routine, announced NRC independent measurements inspection of construction. The Mobile (NDE) Van and two region based personnel assisted by two NRC sub-contract nondestructive examination personnel were utilized. The inspection involved 393 on site inspection hours and 145 off site hours. The purpose of this program was to verify the adequacy of the licensee's welding quality control program. A representative sample of piping systems, sizes, and materials were reexamined to ASME and AWS requirements.

Results: One violation was identified in that two radiographs did not have required penetrameters and proper dispositions.

## DETAILS

### 1. Persons Contacted

#### Long Island Lighting Company (LILCO)

- \*J. M. Kelley, QA Manager (field)
- \*W. J. Museler, Construction Engineer
- \*M. H. Milligan, Project Engineer
- \*T. F. Gerecke, QA Manager

#### Stone and Webster (S&W)

- \*R. S. Costa, PQA Manager
- \*T. T. Arrington, Superintendent FQC
- \*B. C. Jersild, QA Engineer

#### U. S. Nuclear Regulatory Commission

- \*J. Higgins, Senior Resident Inspector
- \*H. W. Kerch, NRC Inspector
- \*R. H. Harris, NRC Technician
- \*J. P. Durr, Chief, M&PS

\*Denotes those present at exit meeting on August 13, 1982.

### 2. Independent Measurements - NRC Nondestructive Examinations and Quality Records Review of Safety Related Piping System:

During the period from July 19 thru July 30, 1982, Quality Records received from Shoreham Nuclear Power Station were reviewed at Region I for completeness and compliance to the licensee's FSAR commitment to applicable codes, standards, and specifications.

An independent verification inspection was conducted during the weeks of August 2, 1982, through August 13, 1982, using Region I Mobile NDE laboratory. This inspection was conducted by Region I Engineering personnel in conjunction with two (2) NDE technicians contracted from Wisconsin Industrial Testing Co. under the supervision of Region I NRC.

The purpose of this examination was to verify the adequacy of the licensee's quality control program. In addition to the required examinations, pipe wall thickness measurements, hardness test and material analyses were performed.

A random sampling was made by the NRC resident inspector, intended to provide a representative sample of piping systems, components, pipe size, materials, shop and field welds to AWS and ASME Class 1, 2, and 3 codes. The items selected were previously accepted by the licensee based on vendor shop and onsite NDE records and process sheets by licensee contractors.

## 2.1 Nondestructive Examination Procedures

The inspector audited the following NDE procedures to ascertain compliance with ASME B&PV Code, Section III 1971 through winter 1972 addenda.

### Stone and Webster Quality Assurance Directives

- (1) QAD 9.31 Rev. 0 Liquid Penetrant Examination, General Requirements
- (2) QAD 9.32 Rev. A Liquid Penetrant Examination, Visible Dye Technique
- (3) QAD 9.41 Rev. A Radiographic Examination, General Requirements
- (4) QAD 9.42 Rev. 0 Radiographic Examination Pipe Welds
- (5) QAD 9.62 Rev. 0 Magnetic Particle Examination Dry Powder, Prod Method
- (6) QAD 9.63 Rev. A Magnetic Particle Examination Dry Powder, Yoke Method

### Reactor Controls Inc.

- (1) RE-1 Rev. 4 Radiographic Examination
- (2) RCI-PE-1 Rev. 5 Penetrant Examination

### NES - Nuclear Energy Services Inc.

- (1) 80A0481 Rev. 6 dated August 21, 1981 ULTRASONIC Procedures for Piping Butt Welds and Longitudinal Welds

### Courter & Co. Inc.

- (1) QAP-8.3 Visible Light Liquid Penetrant Examination

### Stone and Webster NDE Procedures

- (1) NDT-11.1 Rev. A Liquid Penetrant Examination General Requirements
- (2) NDT-12.2 Rev. N/A Radiographic Inspection of Pipe Welds

- (3) NDT-12.1 Rev. 0 Radiographic Examination General Requirements
- (4) NDT-14.2 Magnetic Particle Examination Dry Powder Prod Technique
- (5) NDT-14.3 Magnetic Particle Examination Dry Powder Yoke Technique

Dravo Corp.

- (1) ASME III-MP Rev. 6 Magnetic Particle Examination (Prod & Yoke Method), dated November 12, 1974
- (2) ASME III-RT Rev. 2 Radiographic Test Procedure, dated January 11, 1974
- (3) ASME III-DP Rev. 2 Liquid Penetrant Examination, dated August 13, 1974

Also audited were related welding procedures for each pipe to pipe weld examined and associated piping radiographs.

No violations were identified.

## 2.2 Associated Piping & Engineering (AP&E)

A review of AP&E radiographs and associated documentation was performed. The documents reviewed are as follows:

- a. The inspector reviewed 27 shop weld radiographs, Spools PS-1-A1 and PS-1-A3.
- b. LILCO letter dated June 8, 1982. Subject: NRC IE Bulletin 82-01.
- c. LILCO letter dated July 21, 1982. Subject: NRC IE Bulletin 82-01.
- d. Ultrasonic PSI nondestructive examination reports.

During the review of the above, the following problems were noted:

- a. Weld APE 14398 61871 E1113WD25 D1 linear indications were visually apparent on AP&E radiographs. The radiographic report did not indicate interpretation of these linear indications. The licensee prepared overlays, confirmed and issued a report that the linear indications were visible O.D. weld ripples.
- b. There were two (2) radiographic reports that had incorrect dates. Licensee contacted AP&E for correction.

- c. Weld 1436 2-4-72 AH WB 56.9 SS1S PS-1-A5 film area 14-20 and 25-0 had no penetrameters. Original film was shot as a complete circumference single exposure. Film areas 14-20 and 25-0 were shot at a different exposure time and required penetrameters. Licensee reviewed remaining radiographs and found other film areas that did not have required penetrameters. Licensee has re-radiographed all areas that required penetrameters and has found the welds acceptable.

This is a violation of 10 CFR 50.55a, Codes and Standards (322/82-19-01). The quality of the welding is not in question, but the quality programs for these welds.

### 2.3 Material Traceability

Thirty document packages were reviewed for the following:

- Material Certifications, including weld wire
- NDE results
- Fabrication Records - shop and field drawings (Isometrics)
- Physical properties

No violations were noted.

### 2.4 Nondestructive Examination

The following examinations were performed by NRC and Wisconsin Testing Co., contracted and supervised by NRC Region I:

Radiography - Seventeen (17) welds were examined by radiography using an Iridium 192 source per NRC independent measurements procedure NDE-5, Rev. 0 addenda SH-1-5-1. Welds examined were ASME Class 1, 2 and 3 carbon steel.

Results - Weld E41-1C183-FW02 required further evaluation and did not meet the acceptance criteria of ASME III Code NB/NC 5300. Identified was a linear indication approximately 12 inches in length.

Site field weld E41-1C183-FW02 was re-radiographed and an elongated indication of several inches was apparent and a review of site radiographs verified the same indication.

The inspector returned to Shoreham on August 20, 1982, and reviewed the licensee accumulated data that he obtained after removal of the valve bonnet next to the weld.

- a. Parallax radiographs confirmed that the indication was on the ID surface and that this indication was not masking other indications.
- b. Replica molds were made of the ID that identified the indication as a slight machine mark on the pipe.

The site field weld E41-1C183-FW02 is now acceptable to the NRC.

No violations were identified.

Magnetic Particle - Twelve (12) weldments were examined per NRC procedure NDE-6 Rev. 0 addenda SH-1-6-1. Samples included two (2) ASME Class 3 welds and ten (10) AWS welds.

Results - All areas examined were found acceptable per applicable procedure and acceptance criteria.

Liquid Penetrant - Seventeen (17) welds were examined per NRC Procedure NDE-9 Rev. 0 addenda SH-1-9-1. Samples examined included ASME Class 1 and 3 welds.

Results - All areas examined were found acceptable per applicable procedure and acceptance criteria.

Thickness Measurements - Seven (7) weldments and adjacent pipe material were examined per NRC Procedure NDE-11 Rev. 0 using a Nortec NDT thickness gauge. Minimum wall thickness was determined by using ASTM standard pipe sizes and thickness chart.

Results - All areas examined were within requirements.

Hardness Measurements - Nine (9) pipe components were examined (base material adjacent to welds) using Equo-tip hardness tester per NRC procedure NDE-12 Rev. 0. Hardness numbers were converted to Brinnell hardness values and approximate tensile strength by use of conversion tables.

Results - All areas examined were within acceptable limits.

Ultrasonic Inspection - Two (2) weldments (pipe to valve) were ultrasonically examined per NRC procedure NDE-1 Rev. 0 and Nuclear Energy Service procedure No. 80A9481. Examination was performed from pipe side only due to inaccessibility to area.

Results - No reportable indications were identified.

Visual Examination - Thirty (30) weldments and adjacent base material were inspected for weld reinforcement, overall workmanship and surface conditions per NRC procedure NDE-14 Rev. 0.

Results - All areas inspected were acceptable.

Material - The Alloy Analyzer was used on three (3) stainless steel, type 304 pipes and eight (8) Cu. Ni, 90-10 pipe welds and adjacent base metal.

Results - All areas examined were within  $\pm .02$  of Certified Mill Test Reports values.

Components examined during the inspection and the results are tabulated in Attachment 1.

Exit Interview

At the conclusion of the Inspection, the exit interview was held with licensee representatives denoted in Paragraph 1, on August 13, 1982. The inspector summarized the purpose, results, and scope of this inspection.



Spool/System	Weld No.	Radiography	Magnetic Particle	Liquid Penetrant	Thickness	Ferrite	Hardness	Weld Reinforcement	Alloy Analyze
E41	FW01	Accepted	N/A	N/A	Accepted	N/A	Accepted	Accepted	N/A
IC181	979 C-U1	"	"	"	"	"	"	"	"
E41	985 C-U1-5	"	"	"	"	"	"	"	"
IC182	FW04	"	"	"	"	"	"	"	"
E41	FW02	Rejected	"	"	Accepted	"	"	"	"
IC183	Ultrasonic Insp. FW04	Accepted	"	"	"	"	"	"	"
E41	FW05	N/A	"	Accepted	N/A	"	N/A	"	"
IC134	FW06	"	"	"	"	"	"	"	"
E41	C-U1-5	Accepted	"	N/A	"	"	"	"	"
988	A-U1-5	"	"	"	"	"	"	"	"
E51	FW01	"	"	"	"	"	"	"	"
	270-A&F	"	"	"	"	"	"	"	"
M50	FW-T	N/A	"	Accepted	"	"	"	"	Accepted
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Spool/System	Weld No.	Radiography	Magnetic Particle	Liquid Penetrant	Thickness	Ferrite	Hardness	Weld Reinforcement	Alloy Analyzer
P41	FW05	N/A	N/A	Accepted	N/A	N/A	Accepted	Accepted	N/A
	FW06	"	"	"	"	"	"	"	"
P41	516-A	"	"	"	"	"	"	"	"
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C41-B12-1-01 P0955	H,I,J	N/A	N/A	Accepted	N/A	N/A	N/A	Accepted	Accepted
	K,L	"	"	"	"	"	"	"	"
E11 1C027	FW15	Accepted	N/A	N/A	Accepted	"	"	"	"
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E11 201	H-UL	Accepted	N/A	N/A	N/A	N/A	N/A	Accepted	N/A
	J	"	"	"	Accepted	"	"	"	"
B21 SLP 206-3-03	FWL	N/A	Accepted	"	N/A	"	"	"	"
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B21 1682	B	N/A	Accepted	N/A	N/A	N/A	N/A	Accepted	N/A
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Spool/System	Weld No.	Radiography	Magnetic Particle	Liquid Penetrant	Thickness	Ferrite	Hardness	Weld Reinforcement	Alloy Analyze
E11 1C017	FW02	N/A	N/A	Accepted	N/A	N/A	N/A	Accepted	N/A
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E11 1C017	FW06	Accepted	N/A	N/A	N/A	N/A	N/A	Accepted	N/A
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E11 1C021	FW05	Accepted	N/A	N/A	N/A	N/A	N/A	Accepted	N/A
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B21 NS002	BW02	Accepted	N/A	N/A	N/A	N/A	N/A	Accepted	N/A
	BW06	Accepted	"	"	"	"	"	"	"
E21 1C059	FW07	Ultrasonic Inspection	N/A	N/A	Accepted	N/A	N/A	N/A	N/A
		Accepted	--	--	--	--	--	--	--
E41 PSSH-024	F-3E42	Accepted	N/A	N/A	N/A	N/A	N/A	Accepted	N/A
		--	--	--	--	--	--	--	--
M50 --5058	D, E, H	N/A	N/A	Accepted	N/A	N/A	N/A	Accepted	Accepted
	J, K	"	"	"				"	"