U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-293/84-21

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: July 30, 1984 through August 17, 1984

Inspectors: Harry W Kerch 9/25/84
H. W. Kerch, Mechanical Engineer date
NDE

Richard H Harris 9-25-84
R. H. Harris, NDE, Technician date

R M Campbell 9-25-84
R. M. Campbell, NDE Technician date

Approved by: J. P. Durr 9/28/84
J. P. Durr, Chief, Materials & date
Processes Section, DETP

Inspection Summary: Inspection conducted July 30, through August 17, 1984 (Report No. 50-293/84-21)

Areas Inspected: A special, announced inspection utilizing the NRC Mobil NDE Van to perform nondestructive examination of replacement pipe on the reactor recirculation system. Three regional based inspection personnel assisted by two contracted NDE personnel were utilized during this inspection. The inspection involved 474 onsite hours and 68 hours in the Region I offices.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Boston Edison Company (BECO)

□ H. Brannam, QA Manager
* E.T. Graham, Compliance Group Leader
* E.F. Kearney, Staff Assistant
□* F. Famulari, QC Group Leader
* J.F. Crowder, Senior Compliance Engineer
* P.E. Mastrangelo, Chief Operations Engineer
* K.P. Roberts, Director of Outage Management
□* J.E. Convey, QA Engineer
* F. Schellenger, QE Group Leader
* J.D. Keyes, Regulatory Affairs Leader
A.R. Trudeau, Chief Radiological Engineer
C.J. Mathis, Plant Manager
A.V. Morisi, Manager of Nuclear Management Services

General Electric Company (GE)

* B. Choate, QA Engineer
* M. Hart, QC Supervisor
* R.B. Hamilton, Project Manager

USNRC

□* Martin McBride, Resident Inspector
* Jon Johnson, Senior Resident Inspector
* Steve Pindale, Reactor Inspector

□ denotes those persons present at the August 9, 1984 meeting
* denotes those persons present at the exit interview

2.0 Independent Measurements - NRC Nondestructive Examination and Quality Records Review of Safety Related Systems:

During the period of August 13 through 17, 1984 quality records received from Pilgrim Power Station were reviewed in the regional office for completeness and compliance to the licensee's FSAR commitment to applicable codes, standards and specifications.

An on-site independent verification inspection was conducted during the weeks of July 30 through August 10, 1984 using the NRC Mobil Nondestructive Examination (NDE) Laboratory. This inspection was conducted by regional based personnel in conjunction with NRC contract personnel. The purpose of this examination was to verify the adequacy of the licensee's welding quality control program during replacement of the Recirculation System piping. This was accomplished by duplicating those examinations required of the licensee by the regulations and evaluating the results. These test

results were then compared to the licensee's quality assurance records for completeness, accuracy and correlation.

An NRC inspector made a random selection of pipe weldments which provided a representative sample of the recirculation piping system replaced by the licensee. The selection represents various pipe sizes, shop and field weldments fabricated to ASME Class I Components requirements. The items selected were previously accepted by the licensee based on vendor shop or onsite QA/AC records.

2.1 Quality Assurance Records Review

Thirteen safety-related piping system document packages containing the following documents were reviewed:

- -- Material certification, including weld wire
- -- NDE records
- -- Fabrication records
- -- Drawings (isometrics)
- -- Mechanical and physical properties
- -- Procedures

These documents were reviewed to verify compliance to NRC requirements and licensee's commitments to industry codes and standards.

Results: No violations were identified.

2.2 Nondestructive Examinations

Examinations were performed using NRC procedures with addenda written specifically for compliance to the licensee's FSAR commitment. The intent was to duplicate to the extent possible, the techniques and methods used during the original examination.

The following examinations were performed:

Radiographic Examination

Fourteen pipe weldments were examined per NRC procedure NDE-5, Rev 0.

Results: No Violations were reported.

Liquid Penetrant Examination

Fourteen pipe weldments and adjacent base metals were examined per NRC procedure NDE 9, Rev 0.

Results: No violations were identified.

Visual Examination

Seventeen pipe weldments and adjacent base materials were examined for weld reinforcement, surface condition and overall workmanship per NRC procedure NDE-14, Rev 0.

Results: No violations were identified.

2.3 Review of Procedures

The following procedures were reviewed for compliance with NRC and code requirements.

Welding Procedures

WPS 8.8.1	Rev 1
WPS 8.8.3	Rev 0
WPS 8.8.6	Rev 1

Nondestructive Examination Procedure

PNPS 18.0	Rev 1
PNPS 19.0	Rev 0
PNPS 20.0	Rev 1
PNPS 22.0	Rev 1

Results: No violations were identified.

3.0 NDE Personnel Qualification:

The NDE qualification and certification records of ten employees were reviewed. The acceptance of the records review was based on ASNT-TC-1A and ASME criteria.

Results: No violations were identified.

4.0 Radiographic Review

Thirty-four licensee pipe weld radiographs were reviewed to verify accurate interpretation and the adequacy of the licensee's radiographic program. Nineteen of the above welds were vendor shop welds, and the other fifteen were field welds.

Results: No violations were identified.

5.0 Unresolved Items Found During NRC Inspection

5.1 Pipe Weld Inspection Reference Marks

Site QC personnel noted that GE was not stamping the replacement piping weld joints or marking radiographic references as required by site procedure 23A4-048, Rev 1. This was also noted by the NRC inspectors during this inspection and discussed in a subsequent meeting with Boston Edison management personnel. As of August 9, 1984, the welds were not properly identified and have now created a problem for site NDE contract personnel during inspection and testing. This condition of unmarked pipe welds has caused confusion in correlating NDE results and has caused added radiation exposure to site personnel during examinations.

This is an unresolved item pending licensee action and NRC review. (293/84-21-01)

5.2 Control Rod Drive (CRD) Collet P.T. Examinations

During this inspection, the following was disclosed:

-- CRD 8321 was liquid penetrant examined and rejected. On July 19, 1984, the Licensee issued nonconformance report 84-100 relating to this condition.

-- On July 20, 1984 CRD 8321 was penetrant examined by another licensee contractor and found to be acceptable. Sometime between July 20, 1984 and August 7, 1984 the resident NRC inspector found there was an acceptance and rejection penetrant report for the same CRD 8321.

On August 7, 1984, the NRC re-examined the fillet weld by liquid penetrant which resulted in penetrant indications (bleedout) and required further evaluation and disposition.

The site NDE contractor is currently using General Electric letter BWR SIL #139 as an acceptance standard for penetrant examination of the CRD's. This has caused confusion on the part of the site NDE contractor, since it was only a general outline of acceptance standards for testing. A more detailed procedure specifially adopted for penetrant testing and acceptance of CRD's is required.

A review of existing CRD test data and additional information may be required by site NDE personnel to insure proper examination of CRD's. This item is unresolved pending further licensee action and NRC review (293/84-21-02).

5.3 Review of Relief Request for Inservice Inspection ISI

The inspector reviewed the ISI Program, Section 6.0, Bos-03-13, Revision 0. Relief Request No. PRR-6 identifies pressure retaining ASME classes 1, 2, and 3 piping welds that require both surface and volumetric examinations. Because these welds are painted, the licensee proposes to perform a 100% volumetric, ultrasonic examination in lieu of the surface examination.

The inspector expressed concern that surface examinations were capable of being performed and did not appear to impose undue hardships or increased man-Rem exposures. The concerns were transmitted to the appropriate NRC review office telephonically.

5.4 UT Data Reports

A review of UT-PSI data reports disclosed that these reports do not clearly specify acceptance or rejection status by a responsible reviewer. The licensee has committed to revising his procedure and report form to more clearly define this responsibility. This item is unresolved pending licensee action and NRC review. (293/84-21-03)

Attachments

Attachment No. 1 is a tabulation of the specific items examined and results.

Attachment No. 2 is a list of specific radiographs reviewed during the course of this inspection.

6.0 Exit Interview

An exit interview was held onsite on August 10, 1984 with members of the licensee's staff. The inspector summarized the scope and findings of this inspection. At no time was written material provided to the licensee during the course of this inspection.

INDEPENDENT MEASUREMENT PROGRAM

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ATTACHMENT # 1

SITE: Pilgrim Nuclear Power Station

WELD NUMBER LINE/ISO	CLASS	ALLOY ANAL.	FERRITE	THICK	M.T.	R.T.	U.T.	P.T.	HARDNESS	VISUAL	REMARKS
Loop A P-RH-A-014-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RE-A-048-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RW-A-030-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RW-A-031-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RE-A-040-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RE-A-045-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RH-A-003A-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	N/A	N/A	ACC	
Loop A P-RH-A-003-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	N/A	N/A	ACC	
Loop A P-RE-A-041-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop B P-RE-B-093-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop B P-RE-B-087-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop B P-RH-B-014-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop B P-RE-B-095-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	N/A	N/A	ACC	

INDEPENDENT MEASUREMENT PROGRAM

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ATTACHMENT # 1

SITE: Pilgrim Nuclear Power Station

WELD NUMBER LINE/ISO	CLASS	ALLOY ANAL.	FERRITE	THICK	M.T.	R.T.	U.T.	P.T.	HARDNESS	VISUAL	REMARKS
Loop B P-RE-B-089-FW	1	N/A	N/A	N/A	N/A	ACC	N/A	ACC	N/A	ACC	
Loop A P-RE-A-017	1							ACC		ACC	
Loop A P-RE-A-023	1							ACC		ACC	
Control Rod Drive (CRD) S/N 8321	1							UNRES		ACC	Linear Indications In Edge Of Fillet Weld

RADIOGRAPHIC FILM REVIEW

C - CRACK
SL - SLAG
P - POROSITY
T - TI'NGSTEN

LF - LACK FUSION
IP - INADEQUATE PENETRATION
LI - LINEAR INDICATION
UI - UNFUSED INSERT

A - ARTIFACTS
S - SURFACE
CC - CONCAVITY
CV - CONVEXITY

SYSTEM/LINE	WELD ID	ACC	REJ	C	SL	P	T	LF	IP	LI	UI	A	S	CC	CV	COMMENTS
P-RE-A	FW 029	X										X				
P-RE-B	FW 086	X					X					X				
P-RE-B	FW 093	X					X					X				
P-RE-A	FW 045	X				X	X									
P-RH-A	FW 003A	X										X				
P-RH-A	FW 014	X														
P-RH-B	FW 014	X										X				
P-RH-B	FW 010	X										X				
P-RE-B	FW 095	X				X	X									
P-RH-B	FW 003	X					X									
P-RE-A	FW 014	X												X		
P-RE-B	FW 087	X														
P-RE-B	FW 059	X										X				
P-RH-A	FW 010	X				X	X									
P-RE-B	FW 068	X														
	Vendor Film															
Gulfalloy Inc. S/O Y-2675-3	PC4	X														
Gulfalloy Inc. S/O Y-2675-3	PC5	X														
Gulfalloy Inc. S/O Y-2675-3	PC2	X														

Attachment # 2

C - CRACK
SL - SLAG
P - POROSITY
T - TUNGSTEN

LF - LACK FUSION
IP - INADEQUATE PENETRATION
LI - LINEAR INDICATION
UI - UNFUSED INSERT

A - ARTIFACTS
S - SURFACE
CC - CONCAVITY
CV - CONVEXITY

SYSTEM/LINE	WELD ID	ACC	REJ	C	SL	P	T	LF	IP	LI	UI	A	S	CC	CV	COMMENTS
Taylor Forge Inc. GE P/O 205-YE698	Vendor Film															
803431	SW 4A	X														
803431	SW 5A	X														
Dravo Corporation GE P/O 205-83L218	Vendor Film															
E3524 SK1	SW C	X														
E3524 SK2	SW G	X														
E3524 SK6	SW B	X														
E3524 SK13	SW A	X														
E3524 SK13	SW B	X														
E3524 SK15	SW C	X														
E3524 SK15	SW E	X														
E3524 SK17	SW G	X														
E3524 SK17	SW H	X														
E3524 SK23	SW A	X														
E3524 SK23	SW L	X														
E3524 SK25	SW B	X														
E3524 SK28	SW L	X														
E3524 SK5	SW D	X														

Attachment # 2