

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-353/88-19

Docket No. 50-353

License No. CPPR-107

Licensee: Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Facility Name: Limerick Generating Station Unit 2

Inspection At: Saratoga, Pennsylvania

Inspection Conducted: August 8-12, 1988

Inspectors: Robert A. McBrearty  
R. A. McBrearty, Reactor Engineer  
Materials and Processes Section, EB, DRS

August 31, 1988  
date

Approved by: Jacques D. Strosnider for  
J. R. Strosnider, Chief  
Materials and Processes Section, EB, DRS

9/2/88  
date

Inspection Summary: Inspection on August 8-12, 1988 (Report No. 50-353/88-19)

Areas Inspected: A routine unannounced inspection was conducted of preservice inspection activities to ascertain whether the licensee's activities were conducted in compliance with applicable ASME Code and regulatory requirements. Areas which were inspected include NDE data, tracking of PSI related nonconformance reports and the status of licensee activities regarding the program for qualifying and certifying visual examination personnel. An additional area that was inspected is the licensee's response to Generic Letter (GL) 88-01.

Results: The inspector concluded, based on the areas inspected that the licensee's PSI activities were performed in compliance with applicable requirements of the ASME Code Section XI.

## DETAILS

### 1.0 Persons Contacted

#### Philadelphia Electric Company

- \* J. Corcoran, Manager Quality - LGS
- \* D. Di Paolo, Quality Assurance Superintendent
- \* J. Kerechman, Mechanical Construction Engineer
- \* G. Lauderback, Quality Control Supervisor
- \* K. Meck, Assistant Superintendent, Quality Assurance (Mechanical/Civil)
- \* R. Payne, Quality Assurance Engineer
- \* R. Roe, Nuclear Engineering - NDE Level III
- \* D. Schmidt, Nuclear Engineering - NDE Level III
- \* W. Ullrich, Startup Manager

#### Bechtel Construction Incorporated

- \* B. Foote, Lead Construction Quality Engineer
- \* G. Kelly, Lead Site Quality Assurance, Engineer
- \* W. Mc Cullough, Project Startup Engineer
- \* K. Stout, PC Quality Control Engineer

#### General Electric Company

J. Ganjei, Senior Mechanical Engineer - Plant Design Engineering  
W. Miller, NDE Level III

#### U. S. Nuclear Regulatory Commission

- \* R. Gramm, Senior Resident Inspector

\* Denotes those present at the exit meeting.

### 2.0 Scope of Inspection

The licensee performed preservice inspection (PSI) to comply with the requirements of the ASME Boiler & Pressure Vessel Code, Section XI, and with its preservice inspection plan. The inspections are completed and the licensee intends to submit to the NRC the PSI final report by December 31, 1988.

The following areas were selected for inspection:

- Tracking and closeout of PSI related nonconformance reports.
- PSI examination data including:
  - RPV welds
  - Bolting
  - Dissimilar metal welds
  - Calibration blocks related to the ultrasonic examination of RPV studs
- Licensee Response to Generic Letter 88-01

### 3.0 Findings

#### Preservice Inspection Data Review (73055)

Data associated with the following welds were selected for review by the inspector:

#### Reactor Pressure Vessel

- RPV Weld AA, shell 1 to bottom head circumferential weld
- RPV Weld AC, shell 2 to shell 3 circumferential weld
- RPV Weld BD, shell 2 vertical seam
- RPV Weld BJ, shell 3 vertical seam

#### Dissimilar Metal Welds

- Weld VRR-2RS-2A-N1A, 28" diameter recirculation system nozzle to safe end
- Weld DCA-419-2-N17A, 14" diameter RHR system safe end to nozzle
- Weld DCA-419-1-N5A, 14" diameter core spray system safe end to nozzle

#### Bolting Greater than 2" Diameter

- Closure Head Studs Nos. 1 to 24, 26 to 38, 40 to 76 inclusive plus 4 new studs
- Closure Nuts Nos. 1 to 24, 26 to 76 inclusive plus new nuts numbered 1 to 3

Bolting 2" Diameter and Less

- Incore Housing Flange bolts and washers

The examination data, which are stored under Bechtel control, were found to be complete and easily retrievable. Each data package must be signed out of the storage vault and must be returned by the end of the shift during which it was removed.

The RPV weld data represent ultrasonic examinations which were performed by the General Electric Company using automated and manual techniques. All austenitic piping welds and dissimilar metal welds were ultrasonically examined by General Electric Company using "Smart UT."

The closure head studs were ultrasonically examined. Two studs, S/N 25 S/N 39, were missing at the time the examinations were performed so two of the new studs were identified with the missing numbers and used to replace the two missing closure studs. The nuts were examined using the fluorescent magnetic particle method. The incore housing flange bolting included 220 bolts and washers and were visually examined using the VT-1 method.

The inspector examined the calibration standards which were used for the ultrasonic examination of the closure head studs and found that the calibration reflectors were in accordance with ASME Code requirements regarding size.

The licensee identified discrepancies with the documentation associated with the blocks and with the adequacy of the protection provided to preserve the condition of the flat bottom hole calibration reflectors. The discrepancies include:

1. Material identification is incorrectly stamped.
2. The applicable material heat number is not clearly identified.
3. The design drawings do not clearly identify the location of the flat bottom hole calibration reflectors.
4. The flat bottom holes appear to be inadequately protected from dirt and crud.
5. Complete dimensional inspection reports have not been provided by General Electric Company for the calibration blocks as required by Specification 8031-M-246B, paragraph 4.2.3C.

The item is being tracked by the licensee under QA Finding #2N-621 and Bechtel NCR #13746. The inspector stated that the item is considered unresolved pending licensee action and subsequent NRC review (353/88-19-01).

The inspector determined that the sensitivity of the examinations which were performed using the subject stud calibration blocks was not degraded below the Code required examination sensitivity.

Based on the reviewed data the inspector determined that the related examinations, which included ultrasonic, magnetic particle and visual, were performed in accordance with the governing NDE procedure, and with applicable ASME Code and regulatory requirements. He further determined that limitations to the examinations were documented, and that reportable conditions were properly documented, evaluated and dispositioned.

No violations were identified.

#### PSI Related Nonconformance Reports (NCR) (73055)

Nonconformance reports (NCRs) are written to document PSI results which do not meet applicable requirements, or require further evaluation to determine their status. PSI related NCRs are written by General Electric Company and by the Bechtel Corporation at Limerick Unit 2.

The inspector reviewed selected NCRs to ascertain that corrective action and disposition was provided and that the closeouts were based on the completion of the corrective action. The following nonconformance reports, which were not yet closed at the time of inspection 88-11 in April 1988, were selected for review by the inspector:

- NCR #11093, opened 8/18/86 regarding minimum wall violations
- NCR #11444, opened 11/24/86 regarding minimum wall violations
- NCR #11561, opened 1/6/87 regarding undersize welds reported on the 5RHR heat exchanger
- NCR #12819, opened 12/21/87 regarding an ultrasonic indication detected in RPV closure head to flange weld (AG)
- NCR #12886, opened 1/15/88 regarding discrepancies involving RPV ring girder anchor bolts

The reviewed NCRs were written to document and track discrepancies which included undersize welds, minimum wall violations, an ultrasonic indication which required further evaluation and RPV ring girder anchor bolt torque values and related conditions. No particular trend was established although two of the NCRs were written to correct minimum wall violations.

Nonconformance report # 11561 was referred to General Electric Company and Field Deviation Disposition Request (FDDR) No. HH2-8309, Revision 0 was prepared. The FDDR addressed the RHR heat exchanger tie down brackets and mounting supports which were found to have undersize welds and tie down bracket gussets which have one side welded to the heat

exchanger shell contrary to the drawing. Final disposition of the FDDR stated that the equipment is "acceptable as is" and referenced a design verification statement which is contained in DRF No. E11-00045, a General Electric document maintained at the G. E. facility at San Jose, California. The document was sent to the site at the inspector's request and was found to contain the analysis and calculations upon which the "acceptable as is" determination was based. General Electric Company stated that the calculations are General Electric proprietary information and must be returned to the San Jose facility. The NCR was closed out based on the disposition noted by the FDDR.

The inspector found that the NCRs were all properly closed out based on documented actions.

No violations were identified.

#### Qualification of Visual Inspection Personnel (73051)

Inspection Report No. 50-353/88-11 discussed a suggestion by the inspector regarding the use of flawed samples for the practical test given to candidates for certification as visual inspectors at Limerick Unit 2. The licensee agreed to review the Bechtel certification program with respect to the practical test, and to consider the future use of flawed test samples.

During this inspection the inspector discussed the item with licensee personnel to determine its present status. The licensee provided the inspector with a copy of a PECO letter (PLB-22,454) to Bechtel Construction Inc. dated August 10, 1988 in which PECO requested Bechtel to incorporate into the Bechtel Quality Control Manual for LGS Operations the requirement that practical examinations include visual inspections of components with actual flaws, i.e. known defects. The matter is now awaiting action by Bechtel.

#### 4.0 Licensee Response to Generic Letter (GL) 88-01 "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping" (92703)

Intergranular Stress Corrosion Cracking (IGSCC) near weldments in BWR piping has been occurring for almost 20 years. Early cases were in relatively small diameter piping. In early 1982, cracking was identified in large - diameter piping in a recirculation system of an operating BWR plant in this country. Since then extensive inspection programs have been conducted on BWR piping systems. These inspections have resulted in the detection of significant numbers of cracked weldments in almost all operating BWRs.

Substantial efforts in research and development have been sponsored by the BWR Owners Group for IGSCC Research. The results of this program along with other related work by vendors, consulting firms, and confirmatory research sponsored by the NRC, have permitted the development of revised staff positions regarding the IGSCC problems.

The technical bases for these positions are detailed in NUREG-0313, Revision 2, "Technical report on Material Selection and Process Guidelines for BWR Coolant Pressure Boundary Piping." NUREG-0313, Revision 2 describes the technical bases for the staff positions on materials, processes, and primary coolant chemistry to minimize and control IGSCC problems. Inspection schedules and inspection sample sizes are based on the susceptibility of weldments to initiation and propagation of IGSCC. Inspection schedules are comparable to those specified in Section XI of the ASME B&PV Code in cases where the piping material is IGSCC resistant.

This Generic Letter applies to all BWR piping made of austenitic stainless steel that is four inches or larger in nominal diameter and contains reactor coolant at a temperature above 200°F during power operation regardless of Code classification. It also applies to reactor vessel attachments and appurtenances such as jet pump instrumentation penetration assemblies and head spray and vent components. Licensees are requested to respond to the GL within 180 days of the receipt of the letter.

The GL provides a list of specific items which should be included by licensees to constitute an acceptable response to the GL.

The inspector was provided by the licensee for review a copy of the licensee's response to the GL dated August 2, 1988. In addition to the licensee's response the inspector was provided with additional information including isometric drawings and weld lists identifying the category into which each weld was placed by the licensee.

The information submitted by the licensee was determined to include the five items listed by the GL.

#### 5.0 Unresolved Items

Unresolved items are matters about which more information is required to ascertain whether they are acceptable items, violations, or deviations. An unresolved item is discussed in paragraph 3 of this report.

#### 6.0 Exit Meeting

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on August 12, 1988. The inspector summarized the scope and findings of the inspection.

At no time during the inspection was written material provided by the inspector to the licensee