

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-352/82-10
Docket No. 50-352
License No. CPPR-106 Priority - - Category A
Licensee: Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Facility Name: Limerick Generating Station, Unit 1

Inspection at: Limerick, Pennsylvania

Inspection conducted: July 27-30, 1982

Inspector: *D.A. Beckman*
for R. J. Paolino, Reactor Inspector

8/23/82
date signed

for *D.A. Beckman*
for S. A. Richards, Reactor Inspector

8/23/82
date signed

for *D.A. Beckman*
for S. D. Reynolds, Reactor Inspector

8/23/82
date signed

Approved by: *D.A. Beckman*
D. A. Beckman, Chief, Plant Systems Section

8/23/82
date signed

Inspection Summary:

Unit 1 Inspection on July 27-30, 1982 (Report No. 50-352/82-10)

Areas Inspected: A routine, unannounced inspection of activities associated with the installation of electrical cables, instrument components/systems, quality record review, and inspector follow-up of previously identified items. The inspection involved 68 hours on site by two region based inspectors and 6 hours of in office review by one inspector.

Results: Of the four areas inspected, there were no violations in three areas and one violation in one area (Installation and acceptance of a nonconforming instrument tubing raceway support - paragraph 6).

DETAILS

1. Persons Contacted

Philadelphia Electric Company

- * D. T. Clohecy, Quality Assurance Engineer (QAE)
- * J. M. Corcoran, Field Quality Assurance (FQA) Branch Head
- * J. R. Goodbred, QAE
- * M. J. McGill, QAE
- * G. J. Moffitt, Construction Engineer
- * P. K. Pavlides, QA Manager

Bechtel Power Corporation

- D. Adams, Quality Control Engineer (QCE)
- J. Cutillo, QCE
- E. Chalifoux, QCE
- * K. P. Creech, Subcontract Engineer
- G. Danielson, Assistant Lead QCE
- K. DeMarco, Cable Engineer
- B. Dragon, QAE
- * J. P. Gray, Sr., Lead Piping Engineer
- * J. J. Honer, Senior Lead Subcontractor Engineer
- * M. Jan, Assistant Project Field Engineer
- * J. M. Kelleher, Electrical Engineer
- * R. A. Laneman, Project Electrical Superintendent
- * J. L. Martin, Lead Site QAE
- J. McVeigh, Assistant Piping/Instrument Engineer
- * K. L. Quinter, Assistant Project Field Quality Control Engineer (PFQCE)
- R. Sewell, Lead Field Electrical Engineer
- * K. G. Stout, Project Field QCE
- * D. C. Thompson, Assistant PFQCE
- * M. Tokolics, QAE
- * J. E. Waddington, Lead Electrical QCE
- * R. A. Weitzel, Lead Instrument Engineer

* denotes personnel present at exit meeting

2. Status of Previously Identified Items

(Closed) Violation No. 352/82-05-01 pertaining to the recurring failure to install cable tray edge softeners. The licensee has reinspected all Q-listed cable trays per the revised Section 1.20 of Procedure E-1412. Tray softeners were added where required. Craftsmen have been reinstructed and are now required to acknowledge in writing their understanding of the tray softener requirement. The inspector had no further questions. This item is resolved.

(Open) Unresolved Item 352/82-03-02 pertaining to the exposed area in the bottom of the remote shutdown panel. The licensee has issued Design Change Notice (DCN)-169 dated May 28, 1982 to Drawing

E-1416, Revision 33, which specifies a fire barrier installation for the remote shutdown panel. 10 CFR 50, Appendix R requires a 3-hour fire barrier. Data was not available as to whether the DCN specification was equivalent to a 3-hour fire barrier. This item remains open pending the availability of additional licensee evaluation.

(Open) Unresolved Item 352/81-12-02 pertaining to cable pull tensions within tolerance/accuracy of Tensiometer meter scale. The inspector reviewed licensee's response to Finding Report No. N-274. The report indicates the allowable tolerance to be within maximum tensile strength for soft copper. The licensee's response was determined to be incomplete in that the limiting factor is not always the tensile strength of the copper, but may be the side wall pressure exerted on the cable. The licensee's response did not address the effect on measurement of tension for side wall pressure considerations. This item remains open pending NRC review of additional licensee evaluations.

(Closed) Violation 352/81-16-01 pertaining to the Special Main Steam Isolation Valve (MSIV) casting repair procedure qualification test results. The NRC inspector reviewed the attachments to GE letter to PECO file No. PC-2655 dated May 14, 1982. The review of the procedure qualification data submitted by PECO, GE, and Quaker Alloy indicates that the P-1 (Heat F3758) cast base metal and weld metal tested were capable of meeting minimum SA 216 Grade, WCB properties, when subjected to the 1355F (intercritical), 1200F/1150F double subcritical heat treatment. Acknowledgement of the previous statement does not alter the NRC position that the heat treatment practices employed represent poor engineering practice and do not meet the normal intent of the ASME Code for P-1 materials and SFA 5.1 E7018 filler metals.

By definition, tempering is a subcritical heat treatment. The normal intent of the ASME Code for PWHT of P-1 materials is to conduct the heat treatment at a subcritical temperature which is also below base metal tempering temperatures.

There is still no logical explanation for the disparity in test results between Chemetron test report for lot J514N1Af and Quaker Alloy Test report 316-1Af which indicates the tensile properties as welded to be 77 KSI with 29% Elongation and "stress relieved at 1350F for 8 hrs." tensile strength to be 78 KSI with 30.5% Elongation.

The subject special procedure qualification test results indicate that castings, repaired by the WPS indicated, are capable of having adequate mechanical properties, including toughness above 60F, to meet the ASME Code mechanical property requirements to which they were fabricated. The special procedure qualification tests conducted satisfy the applicable ASME Section IX, Paragraph V-6 requirements and the current Section IX, QW-407.1 requirements.

This item is considered closed.

(Closed) Unresolved Item 352/81-14-01: Power Generation Control Complex (PGCC) drawings need revision via an Engineering Change Notice (ECN) to reflect work performed in accordance with a Field Disposition Instruction (FDI) to correct flexible conduct grounds in the PGCC. The licensee has revised the FDI to indicate which components are affected by the work. The associated design documents have been revised and Specification 22A4027 (MPL No. A61-4050) has been changed per ECN No. NH15444, paragraph No. 6. The licensee has instructed the appropriate personnel to include a list of related design documents in FDI's. This item is closed.

3. Facility Tour

The inspectors observed work activities in progress, completed work and plant status in several areas of the plant during a general inspection of Unit 1. Particular note was taken regarding the presence of quality control inspectors and indication of quality control activities through visual evidence such as inspection records, material identifications, nonconformance and acceptance tags. The inspectors observed the proper in place storage of the following electrical components: Panel Nos. OBC562, OAC562, 10C006 and 10C022. The inspectors noted that the light bulbs used in Panel Nos. 10C014 and 10C001 as heaters were not lit. Job Rule JR-G-7 for GE supplied panels require that panels be checked on a three month basis to assure that heaters in panels are energized. The licensee is using high wattage light bulbs to provide the heat required to prevent condensation/moisture in the panels. The licensee has a weekly surveillance program in effect to detect burned out bulbs. This does not appear to be fully effective. The panels, with the burned out bulbs, identified by the inspector had been inspected by the licensee on July 26, 1982. The licensee has issued Finding Report No. N-320 to review the surveillance program and change the frequency of inspections. This item is unresolved pending NRC review of licensee corrective action. (82-10-01)

4. Electrical (Cables and terminations)- - Work Observation

The inspectors examined work performance, partially completed work, and completed work pertaining to the installation of electrical cable to determine whether the requirements of applicable specifications, work procedures, drawings, and instructions have been met in areas relating to installation, routing, termination and inspection.

The inspector observed the cable pulling evolution for cable scheme 10G501BB, segment C-D. The proper QC personnel were present and the cable pull calculations were available. The inspector verified that the cable was properly labeled and of the specified type. The initial pull was by hand and the inspector noted that special care was taken to prevent cable damage.

No violations were identified.

The inspector verified that cables are being routed as per the Cable Raceway Schedule by physically tracing cable schemes 1AQ102, 1AQ103, and 1CB21712A. The cables were traced using the Tracker II, Model 500, Underground Cable Locator.

No discrepancies in routing were noted.

5. Electrical (Cable and Termination) - Record Review

The inspector reviewed pertinent work and quality records for safety related cable to determine whether the records reflect work accomplishments consistent with NRC requirements and licensee commitments in the area of receipt inspection, certificate of compliance, type and qualification of materials and installation.

Documents reviewed for this determination include:

a. Handling and Identification

- Job Rule E-10, Rev. 10, "Permanent Plant Cable Installation and Termination"
- Material Receipt Reports (MRR) Nos. 69206, 69207, 70960, 72621
- Quality Control Inspection Report (QCIR) Nos. E29-MRR-69206, E28-MRR-69207, E28-MRR-70960, E29-MRR-72621

b. Installation Records

- Quality Control Inspection Reports (QCIR) for Cable Schemes Nos. ODB13208B, ODB13202A, 1BG001Q, 1DD10202A, 1CQ005B, 1CB21719B, 1AJ001A, 1AB21315C, OBB20223G, OBB2023K, 1AA11505A, 1AA11503A, 1AA11508A, 1AA11504A, OCB20323G, 1AA11510E, 1AA11503B, 1AD101J, 1BD101J, 1AQ103, 1AQ102, 1CB21721A
- Bechtel Quality Control Instruction (BQCI) No. E-4.0, Rev. 2, "Installation of Electrical Cable"
- Drawing E-1412, Rev. 17, "Wire and Cable Notes and Details"
- Drawing E-1406, Rev. 34, "Conduit and Cable Trays Notes, Symbols and Details"
- Bechtel Engineering "Cable Installation Inspection Reports" for the months of February through June
- Cable Pull Calculation Sheet for Cable Scheme No. OBB20223K
- Limerick Generating Station FSAR, Chapter 8

- Drawing No. E-963, Rev. 7, "Scheme Number Index with Startup System Number Identification"
- Drawing No. E-964, Rev. 8, "Cable Code Index Units 1 and 2"
- Job Rule G-27 Calculation E-169-S, Rev. 2, "Cable Tension Calculation for Schemes: 1DG501A, BB, 0, 1"
- Drawing E-1500, Rev. 28, "Engineered Safeguard Features Unit 1 Raceway Schedule"
- Job Rule E-2, Rev. 12, "Job Rule for Electrical Field Raceway Reporting System"
- Calculation E-121-S, "Over Tension Justification Calculation for Scheme 1AG501A"
- Drawings E33, E92, E159, E163, E321, and E372
- Job Rule G-27 Calculation E-115-S, "Cable Calculation for Schemes 1AG501BB/1 and 1AG501 A/O"
- Field Change Request No. E7414F

The inspector noted that the QCIR for cable scheme OBB20223K did not have the maximum allowable cable pull tension recorded as required by BQCI E-4.0, although the maximum actual tension observed was recorded. During a cable pull, the QC inspector has the cable pull calculations at the pull site, which lists the maximum allowable tension. The inspector reviewed this calculation and noted that the cable had not been over tensioned. The licensee issued Finding Report No. N-319, which corrected the QCIR and required a sampling of other QCIR's be performed to determine if other similar deficiencies existed. Further review by the licensee and the inspector indicate that the error was an isolated case of administrative oversight.

Drawing E-1412, Rev. 17, Section 6 discusses separation requirements for installation of electrical cable. The inspector noted that sub-section 6.1, paragraph 1, on sheet 6.2, allows selected cables designated engineered safeguard, but non-safeguard in function, to be routed partially or wholly in non-safeguard raceways. The LGS FSAR, Section 8.1.6.1.14, states that non-safeguard cable that is routed in safeguard raceway is identified and treated as Class IE cable up to an isolation device, and further requires Class IE cable to be routed wholly in safeguard raceway. The inspector reviewed the Cable Raceway Schedule and was unable to identify any cable routed via a combination of safeguard and non-safeguard raceway. Licensee personnel responsible for cable installation appeared unfamiliar with the provision, however they indicated that they knew of no cable routed per the provision and commented that the computer

program which routes cable and prints the cable pull cards would not allow a scheme using the provision to be printed for use. The licensee issued Finding Report No. N-322 and committed to investigate why the provision existed, to determine if it had been used, and to resolve the conflict with the FSAR. This item is unresolved pending NRC review of licensee action. (82-10-02)

Drawing E-1500 is a computer printout which lists cable raceway percent fill. When an overflow condition exists, the printout has an asterisk by the fill percent column. Drawing E-1406, Rev. 34, paragraph 5.8, requires the Bechtel Engineering Offices in San Francisco, California to perform acceptability calculations for overflow conditions and requires copies of the calculations be forwarded to the site QC office. The inspector requested calculations for overflow conditions for raceway 1CCSA74, 1CCTA16, 1ACYA05, and 1BTVA01. The licensee was unable to locate any overflow calculations on site. Discussions with licensee and Bechtel personnel indicate that calculations are being performed but copies have not yet been forwarded to the site. The licensee issued Finding Report No. N-325 to identify the problem. This item is unresolved pending NRC review of the requested calculations. (82-10-03)

c. Nonconformance/Deviation Records

- Bechtel Project Special Provisions Notice PSP 6-3.1, Rev. 8, "Control of Nonconforming Items"
- Nonconformance Reports (NCR) Nos. 4364, 8031, 5372, 5384, 5386, 5391, 5550, 5813, and 5845

d. QA Audit Reports

The inspector reviewed QA Audit Reports E-094 and E-103 associated with electrical cable installation. The inspector determined that the audits were being performed as required and that appropriate corrective action was taken as indicated by review of Finding Report Nos. E-154, E-155, E-186, and E-187.

No violations were identified.

6. Instrumentation (Components/Systems)- - Work Observations

The inspectors examined work performance, partially completed work, and completed work pertaining to the installation of instrumentation components/system associated with the control room HVAC chilled water circulation pump and the Core Spray Pump suction to determine whether the requirements of applicable specifications, work procedures, drawings and instructions have been met in areas relating to materials, instrument type, size, installation, and quality control inspections.

Items examined for this determination include:

- FE-90-034B (Flow Element)
- PI-52-1R001A (Pressure Indicator)
- PI-52-1R001C (Pressure Indicator)
- Purchase Order No. P-128C-AC
- Drawing Nos. FJ-52-3 and FJ-52-6
- Material Receiving No. M212 and M001
- Foreign Print No. E21-3050H
- Installation Location Drawing Nos. M-0705 and M-0915
- Support Bracket Drawing No. M-830

The inspector noted that a support bracket for Core Spray Pump instrument tubing shown on isometric drawing FJ-52-3 was not installed in accordance with any detail of Drawing No. M-830, which delineates acceptable generic support bracket design, nor did drawing FJ-52-3 accurately describe the location and orientation of the bracket. In addition, the instrument tubing installation had been inspected and accepted by Bechtel Quality Control as indicated by QCIR No. M52-FJ-52-18-5A dated April 20, 1982. Drawing No. M-830 limits horizontal unistrut tubing support to 12 inches in length if the unistrut is vertically supported on one end only. The installed support is approximately 24 inches in length with only one end vertically supported. This is a violation of 10 CFR 50, Appendix B, Criterion V, the LGS PSAR, Appendix D, Paragraph D.6.4, and the LGS QA Plan, Section 5.0, which require activities affecting quality to be accomplished by documented instructions procedures, or drawings, of a type appropriate to the circumstances. (82-10-01)

The licensee has issued Finding Report No. N-321 which requests engineering evaluation of the support adequacy and investigation of the possibility of other, similar deficient installations. A nonconformance report, No. 5966, was issued to formally identify the problem on July 28, 1982.

7. Instrumentation (Components/Systems) - Record Review

The inspector reviewed pertinent work and quality records for safety related instrumentation to determine whether the records reflect work accomplishments consistent with NRC requirements and licensee commitments in the area of installation, personnel qualification and materials qualification.

Documents examined for this determination include:

- Material Receiving Report (MRR) - PE-1331
- Purchase Order No. LX 366046, Revision 20
- QCIR Nos. MI-MRR-PE-1331 and M-212AC-SF-3149
- GE MPL Nos. 328X340TNG1 and 368247TNG1
- P.O. Nos. 8031-M212A and 8031-M-212AC
- Product Quality Certification for GE items
- MRR Nos. PE-1647 and SF-3149
- GE MPL Nos. 320-73030 and 282-55067

- QCIR-M90-HBD-73-1F-15-1A
- Specification 22A3787 Revision 1
- Welder Qualification for Welders P-OM, P-DK and P-8A.

The inspector determined the records to be current, legible, approved by authorized personnel and retrievable.

No violations were identified.

8. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Unresolved items identified during during this inspection are discussed in Paragraphs 3 and 5.b.

9. Exit Interview

The inspector met with licensee and contractor representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 30, 1982. The inspector summarized the scope and findings of the inspection as described in this report.