U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Reports No. 50-454/81-13; 50/455/81-11

Docket Nos. 50-454; 50-455 Licenses No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: August 19-21, 1981

Inspectors: J. F. Norton 9-2-81
J. F. Norton

J. H. Neisler (In Office) J H Neisler 9-2-81

Approved By: F. C. Hawkins, Acting Chief 9/2/81
Plant Systems Section

Inspection Summary

Inspection on August 19-21, 1981 (Reports No. 50-454/81-13; 50-455/81-11)
Areas Inspected: Observation of containment post-tensioning work activities, review of post-tensioning QA implementing procedures, review of QA post-tensioning records; followup on previously identified post-tensioning unresolved items and licensee actions relative to IE Bulletins. The inspection involved 24 inspector-hours by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

Commonwealth Edison Company

*G. Sorensen, Project Construction Superintendent
*R. Tuetken, Assistant Project Superintendent, PCD
*M. A. Stanish, QA Superintendent
*R. B. Klingler, QA Supervisor
*J. A. Klink, QA Engineer
*H. J. Kaczmarek, QA Engineer
*R. R. Guse, Construction Engineer - Civil
*R. L. Byers, Field Engineer

Blount Brothers Corporation

R. Bay, QA Manager

Inryco Incorporated

J. Baker, Site Superintendent for Construction

*Denotes those attending the exit interview.

Inspection and Enforcement Bulletins (IEB)

IEB 78-12, 12A, 12B, "Atypical Weld Material in Reactor Pressure Vessel." Licensee has submitted documentation showing that weld material used in the Byron Units 1 and 2 reactor pressure vessels met the applicable acceptance criteria. Reference G. B. Georgiev memorandum dated April 7, 1981, Subject: "Review of Weld Material Documentation of Twenty-Seven (27) Reactor Pressure Vessels Fabricated by Babcock and Wilcox Company, in response to IE Bulletin No. 78-12, 12A, 12B. This bulletin is closed.

Licensee Actions on Previous Inspection Findings

(Closed) Unresolved Item (50-454/81-08-06; 50-455/81-07-05). Information was not readily available to comprehensively evaluate proper engineering disposition of a specification change in buttonheading tolerances.

The required information was obtained and evaluated. It was verified that the specification change was properly effected.

Functional or Program Areas Inspected

This inspection consisted of a review of Sargent and Lundy specifications and Blount Brothers procedures relative to post tensioning activities at the Byron site. In process tendon installation and QA inspection activities were observed. Storage facilities for tendons and appurtenant hardware were inspected. Quality records associated with post tensioning were reviewed.

Details of the functional and program areas inspected are documented in the following sections of this report.

1. General

The design of the Byron containment units utilizes the Inryco system BBRV 170 wire unbonded post tensioning system. Individual tendons are capable of developing 2003 kips ultimate force. The Byron containments are both the shallow dome, three buttress type. These vessels are cylinders, capped by eliptical domes with ring girders at the juncture of the wall and dome. The tendon systems are installed separately for the walls and domes. The vertical wall tendons run from the tendon gallery below the base mat to the top of the dome ring girder. Dome tendons consist of three families oriented at 120° and anchored at opposite sides of the dome ring girder. Circumferential tendons are a 240° system, with anchorages staggered at the three buttresses to provide equal numbers at each buttress. The design includes provisions for tendon detensioning for surveillance and testing.

2. Review of Sargent and Lundy Specifications and Blount Brothers Procedures

Sargent and Lundy (S&L) Specification F-2721 for containment post tensioning was examined in conjunction with Blount Brothers Corporation (BBC) Construction Procedures 31, 33, 40, 44, 45, 46, 47, 48, 51, 53, 55, 56, 59 through 63, and 65. The review was directed toward verifying thoroughness and compatibility of the specifications and procedures in the areas of procuring, storage, handling, corrosion protection, placement, buttonheading, stressing and greasing of the post tensioning system components.

No conflicts were noted to exist between the specification and procedures. The procedures appear to adequately address the various aspects of post tensioning construction practice and to provide sufficient control over the QA/QC program.

3. Observation of Work Activities - Containment Post Tensioning

a. Storage

Storage protection for the post tensioning components consists of two warehouses with crushed stone floors. The structures each have two continuously operating ventilating fans. Floor grades preclude surface water entry into the buildings. The tendons are stored on dunnage, heavily coated with corrosion protection grease, and covered with waterproof plastic sheeting arranged to provide protection while affording air circulation and drainage. Several tendons were visually checked for condensation, rust and/or corrosion, with none being evidenced. The storage areas meet requirements for Level D Storage, as described in ANSI N45.2.2.

b. Tendon Installation

The installation of Unit 2 circumferential tendon 67 DF was observed August 20, 1981. The installation was in accordance with BBC Procedure No. 44.

4. Review of Quality Records (Units 1 and 2)

a. Review of Records for Installation, Buttonheading, Stressing and Greasing

For Unit 1, records on circumferential Tendons 2-CB, 3-AC, 9-BA, 32-AC, 32-BA and 39-BA were examined. Unit 2 record review was accomplished for dome Tendons D4-3, D5-5, D5-16, D5-17, D5-31, D5-32, D6-6, D6-12, D6-14, D6-15, D6-23, D6-24, and D6-33. The review verified that all pertinent information was inspected and recorded according to procedures. All records were complete and in order. Data recorded included installation particulars; buttonheading records with deficient or atypical heads delineated on drawings with details of specific deficiencies; stressing ram pressures; shim thicknesses; total tendons elongations; calculations comparing actual elongation to design elongation; greasing records verifying the casings were appropriately filled with filler No. 2090P-4; and tendon tags.

b. Calibration of Measuring and Test Equipment

The calibration/verification records of the following equipment were reviewed:

(1) GO-NO-GO Gauges: BH-63, BH-64, BH-67 and BH-68.

(2) Post Tensioning Feeler Gauges: 2, 4, 5, 10 and 11.

(3) Stressing Gauges: Master B1, Master B2, N2, N143, N239, N258, N285, N286, N325, N326, N327, N601, N1113, N1124, N222, N225, N229, N230 and N231.

(4) Grease Thermometers: 2BN14X-1, 2BN14X-2 and 2BN14X-3.

(5) Pressure Gauges: P-500-1, P-500-2 and P-500-3.

(6) Post Tensioning Ram/Jacks: 8753, 8778, 8779, 8780, 8783, 8784 and 8883.

(7) Eccentricity Gauges (by method QA 9.1.F): ECC-6, ECC-7 and ECC-8.

The records indicated each item was properly calibrated at the frequency specified in BBC Procedure No. 51.

c. Friction Loss Test

Friction Loss Test records were examined for Unit 1 Tendons 61BA, 61CB, 61AC and H61AC. The records indicated the tests had been accomplished in accordance with BBC Procedure No. 65.

d. Personnel Certification/Qualification Records

(1) Training records for 26 Post Tensioning production personnel were reviewed. The personnel met the requirements set forth in BBC Procedure NO. 33.

(2) The Region III inspector reviewed training records of four QA/QC inspectors. Two of these met Level I and two met Level II requirements in accordance with ANSI N45.2.6, and were certified accordingly.

Exit Meeting

The inspector met with licensee representatives (denoted under Persons Contacted) and conducted an exit meeting at the conclusion of the inspection on August 21, 1981. The inspector summarized the purpose and findings of the inspection. The licensee acknowledged the findings reported herein.