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

REGION III

Report No. 50-454/78-09; 50-455/78-09

Docket No. 50-454; 50-455 License No. CPPR-130; CPPR-131

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

Facility Name: Byron Nuclear Generating Station, Units 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: October 31 - November 2, 1978

Inspectors: J. H. Neisler 12 Dec 78

E. W. K. Lee 12/14/78

F. C. Hawkins 12/15/78

Accompanying: D. W. Hayes

Approved By: D. W. Hayes, Chief 12/15/78
Projects Section

Inspection Summary

Inspection on October 31 - November 2, 1978 (Report No. 50-454/78-09; 50-455/78-09)
Areas Inspected: Licensee action on previous findings (Units 1 and 2). Procedures and work activities relative to reactor coolant pressure boundary and safety related piping, valves and welding (Units 1 and 2): work activities and quality records relative to the reactor pressure vessel installation (Unit 1); procedures, work activities relative to safety related components (Units 1 and 2); safety related electrical cable activities (Units 1 and 2); work activities and records relating to concrete (Units 1 and 2), activities relating to reactor vessel

internals (Units 1 and 2). The inspection involved a total of 57 inspector-hours onsite by three NR' nspectors.

Results: Of the seven a:eas inspected, two items of noncompliance were identified (infraction - failure to follow procedure - Section II, Paragraph 2) (Deviation - deviated from Code - Section II, Paragraph 3).

DETAILS

Persons Contacted

Principal Licensee Employees

*G. Sorensen, Project Superintendent
*J. McIntyre, Quality Assurance Supervisor
*J. Mihovilovich, Lead Structural Engineer
*R. Tuetkin, Lead Mechanical Engineer
*G. Smith, Lead Electrical Engineer
*R. Grovewald, Mechanical Quality Assurance Coordinator
*S. Forsha, Structural Quality Assurance Coordinator
*R. Aken, Electrical Quality Assurance Coordinator
J. Porter, Quality Assurance Engineer
H. Hangen, Field Engineer

Hunter Corporation

M. Sonsag, Quality Assurance Supervisor
A. Simon, Quality Assurance Administration Supervisor

Hatfield Company

W. Gratza, Quality Assurance Supervisor

NISCO

R. Larkin, Quality Assurance Supervisor

The inspectors also contacted and interview other licensee and contractor personnel, including craftsmen, QA/QC technical and engineering staff members from licensee and onsite contractor organizations.

*Denotes those attending exit interview.

Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (454/78-06-01; 455/78-06-01): Hunter Corporation Quality Assurance Program and implementing procedures relative to containment penetrations review incomplete.

1. The RIII inspector reviewed the following documents:

a. Procedure SIP7.502, Rev. 2, dated February 4, 1978, Gauge Measuring Equipment Control

b. Procedure SIP20.506, Rev. 4, dated December 14, 1977, Material Handling

c. Procedure SIP3.801, Rev. 0, dated January 25, 1978, Materials Storage Criteria

d. Procedure SIP[illegible].502, Rev. 2, dated February 16, 1977, Visual Inspection

e. Procedure SIP6.501, Rev. 6, dated April 25, 1978, Requesting and Reporting of Nondestructive Examination

f. Procedure SIP3.602, Rev. 2, dated April 28, 1978, Material Receiving and Inspection

g. Procedure SIP20.504, Rev. 8, dated February 7, 1978, Hydrostatic Testing

h. Procedure SIP20.508, Rev. 5, dated February 7, 1978, Pneumatic Testing

i. Procedure SIP11.101, Rev. 3, dated December 14, 1977, Nonconformance Reporting and Processing

j. Procedure SIP9.001, Rev. 2, dated June 20, 1978, Quality Assurance Record Storage

k. Procedure 12.[illegible]01, Rev. 3, dated September 12, 1978, Onsite Quality Assurance Auditing

2. The inspector determined that adequate procedural requirements are included or referenced in the above documents to control the following:

a. Measuring and Test Equipment
b. Handling, Storage, and Shipping
c. Inspection, Inspection Test Status
d. Nonconforming Materials, Parts or Components
e. Corrective Action
f. Quality Assurance Records
g. Audits

This item is considered resolved.

Section I

Prepared by J. H. Neisler

Reviewed by D. W. Hayes, Chief
Projects Section

1. Review of Licensee Action on Previous Inspection Findings

The RIII inspector reviewed the licensee's actions relative to the resolution of specific unresolved items which were noted in previous RIII inspection reports, and which was still in an open status prior to this inspection. The item reviewed and actions relative to the resolution of the item are discussed in the foregoing section of this report.

2. Unit 1 Reactor Pressure Vessel Installation

The inspector reviewed installation records relative to the installation of the Unit 1 reactor pressure vessel and determined the following:

a. RPV installation checklist indicates that mandatory inspection hold points were established and observed. Hold points were initialled by the responsible engineer and the QA representative.

b. Records of leveling and axis orientation measurements indicate that the vessel orientation is within tolerances.

c. Records of machining and leveling of bearing plates indicate final machining and leveling measurements were within the specified tolerance.

d. Visual inspection of the reactor pressure vessel revealed no evidence of mishandling or damage to the vessel during installation and that the vessel was protected from damage likely to occur as a result of construction activities in the area.

No noncompliances or deviations were identified in the above areas.

3. Control Rod Drive Mechanism Installation, Unit 1

a. The inspector reviewed NDE records for welding performed on the Unit 1 RPV head adapter canopy seal for CRDM installations.

b. Installation checklist for CRDM thermal guide sleeves indicate inspection hold points were established and observed.

Hold points were initialed by the responsible engineer and the QA representative.

c. The inspector reviewed procedure CRDM-3004-1-A, dated August 22, 1978, CRDM Installation.

No noncompliances or deviations were identified in the above areas.

4. Safety Related Components

a. The inspector observed activities relative to the pressurizers, reactor coolant pumps, residual heat removal heat exchangers, residual heat removal pumps, letdown heat exchanger, and charging pumps.

b. Receipt inspection reports were reviewed for safety related equipment listed in 4.a above.

c. The inspectors discussed maintenance for stored in place rotating equipment with licensee's mechanical personnel. The licensee is initiating a program of maintenance including the periodic rotation of large pumps and motors. The program is scheduled to be in effect within 90 days.

No noncompliances or deviations were identified in the above areas.

5. Electrical Cables and Terminations - Procedures

The inspector reviewed the following procedures relating to receipt storage and installation of electrical cable.

a. Hatfield Procedure 5, Rev. 1, dated July 7, 1977, Class I Material and Equipment Receiving and Inspection

b. Hatfield Procedure 14, Rev. 1, dated January 29, 1978, Handling and Storage of Safety Related Material and Equipment

c. Hatfield Procedure 10, Rev. 1, Issue 1, dated November 14, 1977, Class I Cable Installation.

No noncompliances or deviations were identified in the above areas.

6. Electrical Cables and Terminations - Observation of Work Activities

The inspector observed activities relative to the storage, identification, issue and installation of electrical cable and materials, including:

a. Inspection of the cable yard. Cable reels are identified by stick-on identification numbers for older reels, or by painting the identifying numbers on the recently received reels. Cable reels were stored on plywood sheets off the ground.

b. The inspector observed work activities relative to the installation of control cable to the essential service water makeup pumps in the river screen house. It was noted that the splice box on the lower elevation of the cable run was full of water. The licensee representatives at the exit meeting stated that they expected the boxes and conduit to always be filled with water. The inspector questioned whether the cable and splices were suitable for an extended period of underwater service. The licensee is requesting information from the architect-engineer whether the environmental extremes expected to exist in the cable run were considered in the design. This item is considered unresolved. (454/78-09-01; 455/78-09-01)

Section II

Prepared by E. W. K. Lee

Reviewed by D. H. Danielson, Chief
Engineering Support
Section 2

1. Reactor Coolant Pressure Boundary Piping and Welding - Review of QA Procedures (Units 1 and 2)

The inspector reviewed 16 Hunter Corporation procedures, one Pittsburgh Test Laboratory procedure and one Sargent and Lundy Engineers Specification. The documents reviewed included installation; cleanliness control; control of weld data sheets, including hold points; qualification of welding procedures, welders, NDE, and inspection personnel; calibration of equipment; repair of defects and control of welding materials. The inspector determined that the procedures met PSAR commitments, QA manual, 10 CFR 50, Appendix B and the applicable code requirements, except the following:

a. The inspector noted that procedures for monitoring welding parameters, such as preheat, interpass temperatures and purge gas were unavailable. Upon questioning the licensee's contractor, the inspector was informed that welding procedures are being revised to include instructions for monitoring welding parameters. The inspector reviewed a sample of the revised welding procedure and ascertained that instructions were included. Furthermore, during observation of welding activities, the inspector determined that welding parameters were checked by temperature crayon, oxygen analyzer, or contact pyrometer. Discussion was conducted relative to the governing procedures for monitoring welding parameters in the interim period until all old welding procedures are phased out. The licensee's contractor agreed to prepare the necessary procedures for use in the interim period.

b. Hunter Corporation Site Implementing Procedure No. 11.201 is not specific relative to the mapping of prepared cavity in the base metal when grinding is required. The licensee's contractor agreed to revise the procedure.

The inspector stated that the above items are considered unresolved pending a review of procedures during a subsequent inspection. (454/78-09-02 and 455/78-09-02)

No items of noncompliance or deviations were identified.

2. Surveillance of Valves

On November 1, 1978, the inspector reviewed Material Surveillance Criteria and Report dated August 10, 1978, for valves stored in all the four warehouses. The inspector noted that inspection of the desiccant on Westinghouse supplied carbon steel valves for continued effectiveness was not performed.

This condition is an item of noncompliance identified in Appendix A. (454/78-09-03 and 455-78-09-03)

3. Review of Welding Procedure

On November 2, 1978, the inspector reviewed Hunter Corporation Welding Procedure No. HC-WPS5 and the procedure qualification record. The inspector established that: (1) the Charpy V notch values deviated from the ASME, B&PV Code, Section III requirements and (2) the voltage and amperage used in qualifying the procedure exceeded the welding procedure range.

This condition is an item of deviation identified in Appendix B (454/78-09-04 and 455/78-09-04)

4. Observation of Reactor Coolant Pressure Boundary Piping Welding Activities - Unit 1

The inspector observed rigging and protection of Unit 1 Reactor Coolant System Spool No. CAE Loop 1-1. It was determined that work activities were performed in accordance with applicable procedures and good construction practices were adhered to.

No items of noncompliance or deviations were identified.

5. Observation of Reactor Coolant Pressure Boundary Piping Welding Activities - Unit 1

The inspector observed welding of fill passes of Unit 1 Safety Injection System Weld No. 172 on Drawing No. SI-15. It was determined that: (1) applicable welding procedure was used, (2) welder was currently qualified, (3) welding procedure requirements were met, (4) work area is free of weld rod-stubs, and (5) physical appearances were acceptable.

No items of noncompliance or deviations were identified.

6. Observation of Safety Related Piping Work Activities - Unit 1

The inspector observed the weld end preparation of Unit 1 Feedwater System penetration No. 84. It was determined that work activities were performed in accordance with the applicable procedures and good construction practices were adhered to.

No items of noncompliance or deviations were identified.

7. Observation of Safety Related Piping Welding Activities - Unit 1

The inspector observed welding of fill passes of Unit 1 Containment Spray System Weld No. 6 on Drawing No. CS-5 and Component Cooling Water System Weld No. 845 on Drawing No. CC-42-2. It was determined that: (1) applicable welding procedure was used, (2) welders were currently qualified, (3) welding procedure requirements were met, (4) work area is free of weld rod-stubs, and (5) physical appearances were acceptable.

No items of noncompliance or deviations were identified.

8. Piping Storage Area

The inspector toured the outdoor piping storage area. It was determined that: (1) spools are identified, (2) spools are resting on dunnage, and (3) ends are covered.

No items of noncompliance or deviations were identified.

Section III

Prepared by F. C. Hawkins

Reviewed by R. L. Spessard, Chief
Engineering Support
Section 1

1. Observation of Fuel Handling Building Concrete Placement Work Activities and Related Quality Records

On October 31, 1978, the inspector observed concrete placement 2.D.474.0.142.W. The 100 cubic yard placement was located along the "21" and "W" lines and 474 slab. The following specific observations were made:

a. Placement Preparation

(1) Review of the preplacement checklist confirmed that all checklist criteria had been met and signed off.

(2) Forms were observed by the inspector to be properly secure and clean.

(3) Reinforcing steel was observed to be free of excessive rust, mill scale, and concrete. Reinforcement was determined to be properly placed in accordance with the appropriate design drawings and job specifications.

b. Delivery and Placement

(1) Concrete Mix Design No. 85-5 was specified and delivered to the placement area.

(2) Concrete, as delivered, was centrally mixed with truck mixing being performed after the addition of water at the point of delivery per the construction specification. The inspector reviewed mixer uniformity test results for both the central mixer and trucks to assure proper concrete mixing and found them acceptable. The inspector observed that after the addition of water in the field to the truck mixer, the proper number of revolutions at mixing speed were performed under the direction of the Blount QC Inspector.

(3) Concrete was observed to be properly deposited and consolidated using adequate equipment and techniques.

(4) Pittsburgh Testing Laboratory field QC personnel performed slump, temperature, percent entrained air and unit weight tests and cast compressive strength cylinders. Concrete sampling and testing techniques were observed by the inspector and found acceptable. Concrete test equipment was calibrated and properly marked to indicate calibration status.

c. Placement Inspection

The Blount Corporation QC inspector was not present at the placement area during this inspector's activities at the placement. He was present at truck discharge and indicated that his inspection responsibilities included the checking of batch tickets for proper mix proportioning, the addition of water at truck discharge, and that the concrete was being placed and consolidated correctly. QC inspection using this type of inspection program, is adequate for a concrete placement of this size, placement location with respect to truck discharge, and production rate. Placements of larger magnitude or faster production/placement rate will require more rigorous QC inspection to assure that a quality concrete product is properly placed and consolidated.

d. Curing

Adequate curing for temperature and moisture control was observed during post placement inspection activities.

e. Concrete Material Storage

(1) Size segregation, deleterious material contamination control, handling techniques, and pile heights for fine and coarse aggregate were inspected and found acceptable.

(2) Cement silos which excluded moisture and contaminants were inspected and found adequate.

(3) Liquid Admixtures were adequately stored to avoid contamination or evaporation.

f. Batch Plant Operation

Volumetric batching devices and scale calibration reports for the main and back-up batch plants were reviewed and found to meet required calibration frequencies and tolerances.

g. Concrete Materials

(1) In-process aggregate tests performed by Pittsburgh Testing Laboratory were reviewed by the inspector and found to conform to specification requirements.

(2) In-process standard physical and chemical cement tests performed by the present cement manufacturer, Medusa Cement Company, were reviewed by the inspector and found to conform to ASTM-C150.

The inspector observed the following conditions controlling the purchase, production, in-process testing and user's sample testing of cement.

(a) The Purchase Order Specification for cement, F-2875 Amend. 1, August 18, 1975, is not a safety-related specification per licensee personnel information. The licensee has taken the position that the individual components that make up concrete (i.e., cement, aggregate, admixtures, water, etc.) are not safety-related, and therefore, the manufacturers of concrete materials are not required to meet 10 CFR 50, Appendix B requirements. This position is reflected in the April 19, 1976 letter from CECo Engineering to CECo QA department which states, in part, "that manufacturers of the ingredients for concrete are not required to have a quality assurance program," and that, "The final proof that quality ingredients have been used . . . is the testing of the hardened concrete cylinders . . . . . ."

This position appears to be in conflict with PSAR Chapter 17.0, Attachment 1, Introduction, in that Attachment 1 commits CECo to Wash 1309 dated May 10, 1974 which contains ANSI N45.2.5 - Draft. The instances in question are discussed in (b) below.

(b) In-process cement tests required by Wash-1309, (ANSI N45.2.5 Draft, Section 4.8) are being performed by the cement manufacturer. Presently, Medusa is supplying all cement for the Byron site, although other suppliers have been used in the past.

1. Test method used by Medusa Portland Cement Company for in-process cement testing is ASTM-C150 and does meet the requirements of Wash-1309 (ANSI N45.2.5-Draft, Table B).

2. Licensee personnel were not aware of the cement sampling method used by Medusa Portland Cement Company and were unable to give the inspector documented or verbal confirmation that sampling methods were in accordance with ASTM-C183 as required by Wash-1309 (ANSI N45.2.5-Draft, Table B).

3. Test frequency used by Medusa Portland Cement Company is not in accordance with Wash-1309 (ANSI N45.2.5-Draft, Table B) requirements. Licensee personnel stated that one Medusa certified Material Test Report represents the average of four individual sets of ASTM-C150 tests, each of the four representing approximately 2000 tons. ANSI N45.2.5-Draft, Table B for in-process tests requires standard and physical cement tests per ASTM-C150 to be performed every 500 bbls. (94 tons).

4. Personnel performing those tests and inspections required by Wash-1309 (ANSI N45.2.5-Draft, Table B) for Medusa Portland Cement Company are required by Section 2.4 of ANSI N45.2.5-Draft to be qualified in accordance with ANSI N45.2.6. The inspector was not given any evidence that this requirement had been met.

5. Measuring and test equipment used to implement the requirements of Wash-1309 (ANSI N45.2.5-Draft, Table B) are required by ANSI N45.2.5-Draft, Section 2.5 to be properly controlled and calibrated at

prescribed intervals against certified standards. The inspector was given no evidence that this requirement had been met.

(c) User's tests, required by job specifications to be performed every 1200 tons by Pittsburgh Testing Laboratory for onsite cement grab samples, do not include the Standard ASTM-C150 physical tests for Compressive Strength (ASTM-C109) and Air Content of Mortar (ASTM-C185). These tests are not required by the job specifications.

As determined during this and previous inspections, the licensee is treating the individual constituents of concrete, after their receipt on-site, as safety-related and therefore, the controls applied following receipt of each material is not of concern. The issue involves the licensee's position stating that the individual constituents of concrete are not safety-related and the effect on the quality program for each before their receipt onsite, as discussed in (a) and (b) above. This item is considered unresolved. (454/78-08-05; 455/78-09-05)

Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of non-compliance, or deviations. Unresolved items disclosed during the inspection are discussed in Sections I, II and III.

Exit Interview

The inspectors met with licensee representatives (denoted under Persons Contacted) at the conclusion of the inspection on November 2, 1978. The inspectors summarized the purpose and findings of the inspection. The licensee acknowledge the findings reported herein.