

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

Region I

Report No. 50-412/78-12

Docket No. 50-412

License No. CPPR-105 Priority -- Category A

Licensee: Duquesne Light Company

435 Sixth Avenue

Pittsburgh, Pennsylvania 15219

Facility Name: Beaver Valley Power Station, Unit 2

Inspection at: Shippingport, Pennsylvania

Inspection conducted: September 26-29, 1978

Inspectors: A. A. Varela
A. A. Varela, Reactor Inspector

10-17-78
date signed

date signed

date signed

Approved by: S. D. Ebnetter
S. D. Ebnetter, Chief, Engineering Support
Section No. 2, RC&ES Branch

10/17/78
date signed

Inspection Summary:

Inspection on September 26-29, 1978 (Report No. 50-412/78-12)

Areas Inspected: Routine, unannounced inspection by a regional based inspector, observation of work and work activities in reinforcing steel installation and cadweld splicing for the containment building exterior wall, concrete preparation for and concrete placement of the containment bottom floor slab, and review of concrete placement quality records on completed exterior containment wall. A site tour was performed, discussions were held regarding a significant deficiency reported September 22, 1978, under 10 CFR 50.55(e), and unresolved items identified during this inspection. The inspection involved twenty-five inspector-hours on site by one NRC regional based inspector.
Results: No items of noncompliance were identified.

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DETAILS

1. Persons Contacted

Duquesne Light Company (DLC)

- *J. Artuso, Consultant
- *R. J. Burgundy, Senior Project Engineer
- *R. Coupland, Director, Site Quality Control
 - H. N. Crooks, Quality Control Supervisor
- *C. R. Davis, Senior Quality Assurance Engineer
- *D. W. Denning, Senior Quality Control Structural Engineer
- *C. E. Ewing, Quality Assurance Engineer
- *C. L. Hill, Quality Assurance Engineer
 - D. Rohn, Quality Control Engineer
- *W. H. Sikorski, Quality Assurance Supervisor
- *R. J. Swiderski, Superintendent - Construction

Stone and Webster (S&W)

- *A. F. Champagne, Site Structural Engineer
 - S. M. Dew, Site Project Engineer
- *K. G. Fellers, Assistant Superintendent
 - N. Hanley, Nuclear Engineer
 - J. G. Novak, Area Manager
 - V. Pardo, Documentation Supervisor
 - C. O'Reilly, Chief of Surveys
 - J. A. Shoemaker, Quality Control, Receiving Inspection
 - W. Volpe, Site Project Engineer
- *J. E. Williams, Resident Manager

Dick Corporation

- A. Cafardi, Quality Control Inspector
- D. Hall, Quality Control Inspector
- J. Long, Quality Control Consultant
- J. McFarland, Resident Engineer
- R. Timko, Quality Control Inspector

Beaver Valley Builders Supply

T. Ordich, Quality Control Engineer

NRC Office of Inspection and Enforcement, Region I

J. A. Serabian, Radiation Specialist, Intern

* denotes those present at the exit interview.

The inspector also interviewed other licensee and contractor personnel during the course of the inspection, including construction crafts.

2. Construction Site Walk-Through Inspection

A tour of the construction site was made to observe work activities in-progress. The inspector examined work items for any obvious defects or noncompliances, and for evidence of quality control of the work. Particular items installed in incomplete construction were identified for discussion and other items requiring QC inspection were noted for later review and discussion. From this review and discussion, resolution was obtained of the inspector's concerns, except for unresolved items identified in Paragraphs 5 and 6 of these details.

No items of noncompliance were identified.

3. Containment Building - Observation of Work in Structural Concrete

Concrete construction activities were observed in the containment building. Work performed, work in-progress and completed work relative to structural concrete were observed accomplished in accordance with NRC requirements, and as identified in the following criteria:

- Beaver Valley Power Station, Unit 2 PSAR Quality Assurance Section 17 and Appendix B
- Beaver Valley Power Station, Unit 2 PSAR Section 15, Codes of Practice
- Specification 940, Mixing and Delivery of Concrete
- Specification 904, Placing Concrete and Reinforcing Steel
- Specification 903, Concrete Testing Services

- FCP-117, Placement of Concrete
- FCP-106, Concrete Placements in the Reactor Containment Exterior Wall
- FCP-603, Cadwelding of Reinforcing Steel
- Beaver Valley Site QC Inspection Procedure IP-6.2.3

Work activities and QC inspection were observed to conform to the above criteria. The inspection included interviews with construction supervision and QC personnel. The following areas were observed:

a. Observation of Rebar Installation and Cadweld Splicing in Exterior Wall

The inspector observed the condition of curved, #18 horizontal hoop and diagonal rebar lengths identified by tags and heat numbers and unique mill markings for installation in upper exterior wall of the containment building. The bar ends were prepared prior to installation for cadweld splicing and were protected as required by field procedure FCP-110, Section 9.4. He inspected the results of recently fired cadweld splices on exterior hoop splice in the north quadrant at elevation 780', and he observed one complete splice operation on splice number 14005 made by the operator, I-56.

No items of noncompliance were identified.

b. Observation of Preparations and Placement of Structural Concrete in Containment Floor Slab

The inspector observed concrete placement preparations and reviewed construction drawings for details of reinforcing steel size and spacing, construction joint key ways and embedments for an east section of floor slab at elevation 629' - 11", adjacent to reactor containment lower sump pump cubicle. This placement involved 50 cubic yards of 5,000 psi, (90 day) concrete placed by pumping. He determined work and inspection activities were accomplished in the preparation and in concrete placement according to applicable specifications, codes, standards, drawings and procedures in the following areas:

- Rebar and Embedment Installation
- Placement Preparation

- Delivery, Placement and Concrete Testing
- Batch Plant Operation
- Storage and Qualification of Concrete Ingredients
- Generation and Control of Batch Records
- Inspection by Qualified QC Personnel

No items of noncompliance were identified.

4. Containment Building Record Review Exterior Wall Concrete Placement

The inspector reviewed pertinent work and QC concrete placement records for the first and second six-foot lifts of the containment building exterior wall. These placements involved 430 cubic yards each of 3,000 psi concrete placed by pumping on April 5 and 13, 1978.

The records were reviewed for conformance with criteria identified in Paragraph 3.

The inspector reviewed documents relative to the following:

- a. Placement Preparation - location preparation, preplacement inspection and construction joint preparation.
- b. Batch Plant Operation - plant and delivery fleet certification, production controls and records, calibrations, inspection and qualification of inspection personnel, audit of batch plant contractor, Beaver Valley Builders Supply Quality Assurance Program.
- c. Delivery and Placement - delivery and placement of specified mix, records of batches mixed, delivered and controlled, records of water added at placement and required trucking re-mixing, required tests and acceptability of concrete sampled at end of pump discharge, use of calibrated test and measuring equipment, inspection records relative to placement and consolidation, qualifications of inspection personnel.

- d. Concrete Materials - certification and user tests, control of material/receipt/storage/identification.
- e. Concrete Test Cylinders/Compression Strength - required 28 day compression strength of four sets of three laboratory cured test cylinders made of concrete sampled at end of pump line were observed to be above 4,000 psi.
- f. Concrete Curing - inspection records disclosed inspection was performed during the curing period and on form removal.
- g. Audit of batch plant contractor, Beaver Valley Builders Supply Quality Assurance Program performed May 25-26, 1978, by DLC QA personnel identified three findings pertaining to equipment, material storage and maintenance of batch plant. The significance of these, as identified in the audit report, did not adversely effect the quality of work.

No items of noncompliance were identified.

5. Significant Deficiency Reported Under 10 CFR 50.55(e) - Inadequate Structural Design Lower Pump Cubicles

Pursuant to the requirements of 10 CFR 50.55(e), DLC informed the NRC regional office by phone on August 24, 1978, of a significant deficiency concerning inadequate structural design of the Lower Pump Cubicles (LPC). DLC sent final report 78-02, September 22, 1978, informing the NRC that all construction work was stopped pending a more detailed review of calculations to determine the implications of the inadequate design. The inspector discussed the final report with DLC and S&W and noted that corrective action to remedy the significant deficiency was incomplete. He inspected the LPC area and observed that some concrete work had been completed prior to work stoppage. Corrective action will be reviewed in a subsequent inspection for all its quality related aspects. Unresolved item 412/78-12-01.

6. Unresolved Item Regarding ACI 318 Code for Pipes Embedded in Concrete of Containment Basemat

ACI 318, Section 6.3.2.2 states that pipes embedded in concrete shall not contain liquids, gas or vapor in excess of 150° F. In discussion with DLC and S&W regarding containment recirculation spray suction

pipes from the containment sump, embedded in the basemat, it was noted that the pipes are designed to carry emergency cooling water from within the containment at temperatures of 220° F. This appeared to be an inconsistency with the code. Therefore, the inspector requested engineering justification for the variance with Code Section 6.3.2.2. Unresolved item 412/78-12-02.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items or items of noncompliance. Unresolved items disclosed during the inspection are discussed in Paragraphs 5 and 6.

8. Exit Interview

At the conclusion of the inspection on September 29, 1978, a meeting was held at the site with representatives of the licensee and contractor organization. The inspector summarized the results of the inspection as described in this report.