UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 50-412

DEC 28 1979

Duquesne Light Company
ATTN: Mr. E. J. Woolever
Vice President
435 Sixth Avenue
Pittsburgh, Pennsylvania 15219

Gentlemen:

Subject: Crane Wall Reinforcing Steel (Your letter of December 5, 1979)

Thank you for your letter, referenced above, which forwarded a final report pursuant to 10 CFR 50.55(e) regarding the subject matter.

This matter will be reviewed during a subsequent inspection.

Your cooperation with us is appreciated.

Sincerely,

S. D. Ebneter

for Robert T. Carlson, Chief
Reactor Construction and
Engineering Support Branch

cc:
R. J. Washabaugh, Quality Assurance Manager

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8001240284

Duquesne Light
435 Sixth Avenue
Pittsburgh, Pa.
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(412) 456-6000

December 5, 1979

United States Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

ATTENTION: MR. BOYCE H. GRIER, DIRECTOR

SUBJECT: Beaver Valley Power Station - Unit No. 2
Crane Wall Reinforcing Bars
Docket No. 50-412
Significant Deficiency Report No. 79-03

Gentlemen:

During construction of the reactor containment crane wall, 28 No. 11 reinforcing bars and 78 No. 4 reinforcing bars were omitted from a concrete placement. The problem was reported to Mr. L. Narrow of the Nuclear Regulatory Commission, Region I, on November 2, 1979.

Pursuant to the requirements of 10CFR50.55(e), the final report on this problem is attached for your review.

The concrete in the area of the crane wall where reinforcing was omitted has been removed as necessary and is currently being rebuilt. If you have any questions concerning this report, we are available to meet with Nuclear Regulatory Commission personnel at their convenience.

DUQUESNE LIGHT COMPANY

By E. J. Woolever
E. J. Woolever
Vice President

Enclosure

cc: Dr. E. Volgenau (15)
Mr. William G. McDonald

Copy of 7912160348

FINAL REPORT

ON

CRANE WALL REINFORCING BARS

AT

BEAVER VALLEY POWER STATION - UNIT NO. 2

1.0 SUMMARY

During the construction of the reactor containment crane wall, twenty-eight No. 11 reinforcing bars and seventy-eight No. 4 reinforcing bars, as shown on the Engineers' drawings, were omitted from a concrete placement.

2.0 IMMEDIATE ACTION TAKEN

A Nonconformance and Disposition Report was initiated and all construction work in the vicinity of the affected area was stopped. The Nuclear Regulatory Commission was informed of the deficiency by telephone on November 2, 1979.

3.0 DEFICIENCY

The reactor containment crane wall is a reinforced concrete cylindrical wall, 106 ft. outside diameter, extending from the fourteen columns which support it at Elev. 714 ft.-0 in. to top of wall at Elev. 815 ft-5 in. Its major functions are (1) to provide a support for the polar crane (2) to enclose one side of the three steam generator cubicles and the pressurizer cubicle (3) to provide radiation shielding for the annular area between it and the reactor containment exterior wall and (4) to support various piping, instrument, and electrical components. Its thickness varies from 2ft.-0 in. to 2 ft.-9 in. with local areas further thickened in the vicinity of major pipe restraints. There are various doorways and openings through the crane wall and integral beams within the wall where required. Full or partial floor slabs frame into and are supported by the crane wall at elevations 718 ft.-6 in, 738 ft.-10 in. and 767 ft-10. in. Cubicle walls oriented approximately radially also frame into the crane wall. All of the major components in the reactor containment are located inside the crane wall with the annular area outside the wall being used for access and interconnecting these components.

The area of concern is located between horizontal construction joints at Elev. 755ft.-10 in. and Elev. 762 ft.-5 in. and between aximuths 97° and 134° (an arc length of about 34 ft.). During the construction of this section of wall, twenty-eight No. 11 vertical bars, approximately 20 ft. long, and seventy-eight No. 4 shear bars, approximately 4 ft. long were omitted. The omission was discovered while preplanning placement of reinforcement for the area immediately above Elev. 762 ft.-5 in.

4.0 ANALYSIS OF SAFETY IMPLICATIONS

A review of the design in the area of the nonconformance was performed. The crane wall section that includes the area where the reinforcing was omitted has been analyzed twice, once assuming the reinforcing as shown on the Engineers' drawings and once assuming the absence of the omitted bars. This wall was analyzed as a part of the elastic analysis of the pressurizer cubicle using the computer program STRUDL. The capacity of the wall for each case was determined in accordance with PSAR requirements.

The results of these analyses indicate that, with the absence of the omitted bars, the remaining reinforcing in this local area would be subject to design stress levels in excess of yield if subjected to one or more of the required loading combinations. Also, the design allowable shear stress carried by the concrete would be exceeded. With all reinforcing in place as shown on the Engineers' drawings, the design stresses remain within allowable limits under the applicable loads and required loading combinations.

A failure analysis was not performed. However, it was assumed that some degree of structural failure might occur under certain accident conditions if the omitted reinforcing were not in place.

5.0 CORRECTIVE ACTION TO REMEDY DEFICIENCY

The concrete in the area of the crane wall where reinforcing was omitted will be removed and rebuilt as necessary, incorporating reinforcement equivalent to that originally shown on the Engineers' drawings.

Detailed procedures were developed and/or revised as necessary to implement performance, inspection and documentation requirements relative to removal operations, replacement of reinforcement and concrete placement.