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September 24, 1980

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Limerick Generating Station Units 1 and 2
Docket Nos. 50-352 and 50-353

Dear Mr. Eisenhut:

Transmitted herewith for filing with the Commission is Amendment No. 24 to Philadelphia Electric Company's Application in the above-captioned matter. This filing consists of three originals and 37 copies of the Amendment and 75 copies of revised pages to be inserted in the Limerick Preliminary Safety Analysis Report.

A summary description of the revisions to the Limerick Preliminary Safety Analysis Report which are being made by this Amendment is provided in Attachment A to this letter.

Very truly yours,

Eugene J. Bradley

B001.1/75

EJB:mk
Enclosures

B

ATTACHMENT A

SUMMARY DESCRIPTION OF REVISIONS MADE BY AMENDMENT NO. 24 TO LICENSE APPLICATION

LIMERICK GENERATING STATION, UNITS 1 AND 2

The Applicant has and continues to base acceptance of concrete on compressive strength tests in accordance with Section 4.1.4 of ACI 318-71. Amendment No. 24 to Philadelphia Electric Company's License Application for Limerick Generating Station, Units 1 and 2 revises the Preliminary Safety Analysis Report to clarify the basis for the specified compressive strength testing of concrete as follows:

1. For 4000 psi or less concrete, acceptance shall be based on compressive strength testing performed at 28 days.

2. For 5000 psi concrete (D-Mix), acceptance shall be based on compressive strength testing performed at 90 days.

In the production of 5000 psi concrete (D-Mix), the specified compressive strength at 28 days has not always been attained despite rigorous efforts to identify and correct the specific cause. All concrete, regardless of the design strength, uses the same materials. However, only the D-Mix exhibits the slower strength gain characteristic.

The applicant initiated regular 90-day compressive strength testing in early 1978, while retaining 28 day testing as the basis for acceptance of D-Mix concrete. Since that time, all D-mix placements have exceeded 5000 psi compressive strength when tested at 90 days.

In cases where the D-Mix concrete did not attain the specified 5,000 psi at 28 days nonconformance reports were written. For approximately 95% of the placements covered by these nonconformance reports, the actual compressive strengths at 28 days exceeded the required design strengths. For these placements the more conservative formula for determining the allowable shear stress in Section 11.4.1 of ACI 318-71 was used when a higher allowable shear value using the formula in Section 11.4.2 of ACI 318-71 is permitted.

The few placements which did not develop 28 day strengths in excess of the required design strengths did develop an average compressive strength of 5500 psi at 90 days which is in excess of the design requirement.

The Applicant's experience and the literature indicate that the compressive strength of concrete increases continually and substantially after 90 days. Figure 23 of reference 1 shows that for Type II cement, which is used at the Limerick jobsite, the increase in strength from 90 days to one year is approximately 13%, and from 90 days to 5 years is approximately 23%. Full design loading of structures incorporating D-Mix concrete will not occur until long after 90 days following placement.

The above facts demonstrate that the acceptance of D-Mix concrete based on compressive strength tests performed 90 days after placement provides assurance that (1) the required design strengths have been achieved and (2) when full design loadings are imposed on the structure, an additional margin of safety will exist. The acceptance of D-Mix concrete based on 90 day compressive strength test results is, therefore, considered to be both justified and conservative.

Section 4.1.4 of ACI-318-71 permits the acceptance of concrete tested at ages other than 28 days; therefore the acceptance of D-Mix concrete based on 90 day compressive strength test results is consistent with the Applicant's commitment to ACI-318-71.

References

1. Bureau of Reclamation Concrete Manual, Eighth Edition U.S. Department of Interior, 1975.

HDH/mtk 6/1

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of	:	Docket Nos. 50-352
	:	
PHILADELPHIA ELECTRIC COMPANY	:	50-353

AMENDMENT NO. 24

TO

LICENSE APPLICATION OF

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
UNITS NO. 1 and 2

Edward G. Bauer, Jr.
Eugene J. Bradley

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Attorneys for
Philadelphia Electric Company

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of	:	Docket Nos. 50-352
	:	
PHILADELPHIA ELECTRIC COMPANY	:	50-353

AMENDMENT NO. 24

TO

LICENSE APPLICATION OF

PHILADELPHIA ELECTRIC COMPANY

Philadelphia Electric Company hereby amends its Application in the above-entitled proceedings by making the deletions, substitutions, and additions to the Preliminary Safety Analysis Report shown on the document entitled "LIMERICK GENERATING STATIONS, UNITS 1 and 2, AMENDMENT 24, PSAR PAGE REVISIONS" dated August, 1980, filed herewith and made a part hereof.

Respectfully submitted,

PHILADELPHIA ELECTRIC COMPANY

By _____
Senior Vice President

COMMONWEALTH OF PENNSYLVANIA :

ss.

COUNTY OF PHILADELPHIA :

V. S. BOYER, being first duly sworn, deposes and says:

That he is Senior Vice President of Philadelphia Electric Company, the Applicant herein; that he has read the foregoing Amendment and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

V. S. Boyer

Subscribed and Sworn to
before me this 23rd day
of September, 1980.

Elizabeth H. Boyer

Notary Public

ELIZABETH H. BOYER
Notary Public, Phila., Phila. Co.
My Commission Expires Jan. 30, 1982

CERTIFICATE OF SERVICE

I certify that service of the foregoing Amendment No. 24 was made upon Mr. Richard K. Allebach, Chairman of the Board of Supervisors, 301 Royersford Road, Royersford, Pennsylvania 19468; and Mr. Thomas M. Gerusky, Director, Office of Radiological Health, Department of Environmental Resources, P. O. Box 2063, Harrisburg, Pennsylvania 17105; by mailing a copy thereof via first-class mail, postage prepaid and properly addressed, this 24th day of September, 1980.

Eugene J. Bradley

Attorney for
Philadelphia Electric Company

LIMERICK GENERATING STATION

UNITS 1 & 2

AMENDMENT 24

PSAR PAGE REVISIONS

The following PSAR pages are to be inserted into your copy of the PSAR. These pages are either replacements or new pages as indicated below:

Delete	Substitute
	Volume 2
Page 5.2-13	Page 5.2-13 (dated August 1980)
Page 5.2-16	Page 5.2-16 (dated August 1980)

5.2.5 Materials and Materials Testing

Four basic materials systems make up the primary containment:

a. Concrete and reinforcing steel for the base slab, cylindrical-conical walls and diaphragm slab.

b. Steel plate for the liner.

c. Steel for the head, penetrations, and their anchorages.

d. Structural steel for support of floor and platforms.

Detailed specifications and working drawings for these materials and their installation are of such scope as to assure that the quality of work is commensurate with the necessary integrity of the primary containment.

5.2.5.1 Materials

5.2.5.1.1 Concrete

Concrete for the primary containment has a specified compressive strength of 4,000 psi at 28 days.

a. Cement is Type II, as specified in "Standard Specifications for Portland Cement", ASTM Designation C-150, and is tested to comply with ASTM C-114.

b. Aggregates will conform to ASTM Designation C-33 except for the gradation of the high density aggregates which will be well graded to produce a workable mix that meets all shielding requirements.

c. Water for mixing concrete is clean and free from any deleterious amounts of acid, alkali, salts, oil, sediment, or organic matter.

d. Admixtures shall conform to ASTM C-260 for air entraining agents, and ASTM C-494 for water reducing agents.

e. Concrete mixes are designed in accordance with ACI 613, using materials qualified and accepted for this work.

Trial mixes are tested in accordance with applicable ASTM Codes as indicated below:

5. Section 3.5.1(a) of the 1974 Supplement to ACI 318-71 applies in lieu of Section 3.5.1(a) of ACI 318-71.

6. The following requirements apply in lieu of the first sentence of Section 4.1.4:

   F'c for 5000 psi design strength concrete shall be based on tests of 90 days. F'c for all other concrete design strengths shall be based on 28 day tests.

7. The following requirements apply in lieu of the last sentence of Section 4.3.1:

   Each strength test result shall be the average of two cylinders from the same sample tested at 28 days for concrete with a design strength of 4000 psi or less and at 90 days for concrete with a design strength of 5000 psi.

c. ACI 347-68 - Recommended Practice for Concrete Formwork.

d. ACI 306-66 - Recommended Practice for Cold Weather Concreting.

e. ACI 605-59 - Recommended Practice for Hot Weather Concreting.

f. ACI 613-54 - Recommended Practice for Selecting Proportions for Concrete is used except that the following recommended laboratory tests on pages 211-14, 211-15 and 211-16 are not used:

   Fineness of portland cement by air permeability apparatus - ASTM Designation C 204

   Specific gravity of hydraulic cement - ASTM Designation C 188

   Percentage of shale in aggregates - AASHO Designation T 10

   Alkali reactivity, potential, of cement - aggregate combinations - ASTM Designation C 227

   Air content (volumetric) of freshly mixed concrete - ASTM Designation C 173

   Air content of fresh concrete by pressure methods (Washington-type meter) - Bureau of Reclamation Concrete Manual, Designation 24

   Air content of freshly mixed concrete - Corps of Engineers Handbook for Concrete and Cement Designation CRD-C 41

   Laboratory concrete mixing - Bureau of Reclamation Concrete Manual, Designation 28