June 30, 1982

Docket No. 50-237
LS05-82-06-137

Mr. L. DelGeorge
Director of Nuclear Licensing
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. DelGeorge:

SUBJECT: SEP SAFETY TOPIC II-4.D, STABILITY OF SLOPES
DRESDEN NUCLEAR POWER STATION, UNIT NO. 2

Enclosed is a copy of our evaluation of Systematic Evaluation Program Topic II-4.D, "Stability of Slopes." This assessment compares your site condition, as described in the docket and references with the criteria currently used by the regulatory staff for licensing new facilities.

Based on the information obtained during the June 16, 1982 site visit and your submittals of December 8, 1981 and March 26, 1982, the staff concurs with your conclusion that the slopes for the Dresden 2 Nuclear Power Station Unit No. 2 do not pose a safety hazard.

Our review of this topic is complete and this evaluation will be a basic input to the integrated safety assessment for your facility unless you identify changes needed to reflect the existing site condition at your facility. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic are modified before the integrated assessment is completed.

Sincerely,

Paul O'Connor, Project Manager
Operating Reactors Branch No. 5
Division of Licensing

Enclosure: As stated

SE04
DSU USE EX (16)

cc w/enclosure: See next page 2

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Systematic Evaluation Program Assessment
Topic: II-4.D, Stability of Slopes
Plant Name: Dresden Nuclear Power Station, Unit No. 2
Prepared by: Jacob Philip, Geotechnical Engineer,
HGEB, DE, NRR

I. INTRODUCTION

This topic pertains to the Geotechnical Engineering review of the stability of all earth and rock slopes, both natural and man-made (cuts, fills, embankments, dams, etc.), whose failure, under any of the conditions to which they could be exposed during the life of the plant, could adversely affect the safety of the plant. The scope of the review embraces the following subjects which are evaluated using data developed by the applicant and information available from all sources: (1) slope characteristics; (2) design criteria and analyses; (3) results of field and laboratory tests; (4) excavation, backfill, and earthwork in slopes; (5) liquefaction potential affecting slopes; and (6) proposed instrumentation and performance monitoring.

II. REVIEW CRITERIA

The current criteria for review of this topic are contained in NUREG-0800 Standard Review Plan 2.5.5, "Stability of Slopes."

III. RELATED SAFETY TOPICS AND INTERFACES

Geotechnical Engineering aspects of Settlement of Structures and Buried Equipment are reviewed under Topic II-4.F. Other interface topics include II-4.E, "Dam Integrity;" II-3.C, "Safety-Related Water Supply (Ultimate Heat Sink);" III-6, "Seismic Design Considerations;" XVI, "Technical Specifications;" III-3.C, "Inservice Inspection of Water Control Structures;" III-3.A, "Effects of High Water Level on Structures;" and IX-3, "Station Service and Cooling Water Systems."

IV. REVIEW GUIDELINES

In general, the review process was conducted in accordance with the procedures described in NUREG-0800 Standard Review Plan 2.5.5. The geotechnical engineering aspects of the design and as-constructed condition of slopes were reviewed and compared to current procedures and criteria and the safety significance of any differences was evaluated.

V. TOPIC EVALUATION

The Dresden Nuclear Power Station is located in Grundy County, Illinois, approximately 15 miles southwest of Joliet, Illinois, and approximately 2000 feet west of the western shore of the Kankakee River, at the confluence of the Kankakee, Des Planes and Illinois Rivers. The ground surface in the vicinity of the Dresden Station is at elevation +517 feet (USGS datum).

The only slopes at the Dresden Plant considered critical with regard to slope stability are those of the intake canal from the river to the crib house and of the discharge canal from the plant to the river.

The intake and discharge canals are about 56 feet wide and are cut on an average of 13 feet to 25 feet into sandstone rock, with near vertical side slopes. The rock top varies from elevation +508 feet to greater than +510 feet. The maximum height of soil above rock along the canals, is about 6 feet. The overburden slopes are inclined at 3 horizontal to 1 vertical. The normal pool level in the canals is at elevation +505 feet while the maximum historic flood level is at elevation +506.6 feet. The overburden slopes are above the canal water level and also lie above the water table (normal groundwater level between elevations +505 feet and 508 feet) and are thus dry.

The licensee performed a "sliding wedge" slope stability analysis. Using a seismic coefficient of 0.2g and soil parameters of ϕ=34° and τ=125 pcf for the overburden soils, the minimum factor of safety was larger than 1.5. This value is acceptable since the SSE for the site response spectra is .13g horizontal. If the overburden slopes failed and this material moved into the canal there would still be an ample water supply in the intake canal for use in the station operation.

The rock into which the canals are cut is sound and capable of maintaining a stable vertical cut under earthquakes or other events. The rock, locally referred to as the Pottsville sandstone, is composed predominantly of cemented sub-angular fine to medium grains of quartz containing varying amounts of mica. No evidence of faulting is evident in the sandstone at the site, but there are occasional vertical joints. Laboratory compressive strength tests on the sandstone indicate strengths of the rock in excess of 3000 psi.

VI. CONCLUSIONS

Based on the evidence presented by the licensee and discussed in the preceeding section, and the fact that sufficient water is available even in the unlikely event that the overburden soils do fall into the canal, the staff concurs with the licensee's conclusion that slope stability is not a safety concern for Dresden Unit 2.

VII. REFERENCES

1. "Dresden 2, SEP Redirection, NRC Docket No. 50-237," letter to Mr. P. O'Connor, NRC from Mr. T. J. Rausch, Commonwealth Edison, December 8, 1981.

2. "Dresden 2, SEP Topic II-4.D, Stability of Slopes and II-4.F, Settlement of Foundations and Buried Equipment," letter to Mr. P. O'Connor, NRC from Mr. T. J. Rausch, Commonwealth Edison, March 26, 1982.

3. Response to staff request for additional information; document submitted in person to Mr. J. Philip, NRC by Mr. R. Nelson, Sargent and Lundy, June 16, 1982 (to be docketed).

4. Technical Evaluation Report, "Hydrologic Considerations," submitted by Franklin Research Center to NRC, May 7, 1982 (NRC-TAC number 41364, 41353, 41342 and 41331).

5. Plant Design and Analysis Report (PDAR), Dresden Unit 2, Volume III - Site and Environs, Section 2 - Geology, April 1965.