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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

JAN 12 1967

Mr. Harold L. Price
Director of Regulation
U. S. Atomic Energy Commission
4915 St. Elmo Avenue
Bethesda, Maryland

Dear Mr. Price:

Transmitted herewith are statements on the geology and hydrology of the Consumers Power Company Palisades Nuclear Power Plant site, Michigan, as requested in Mr. Edson G. Case's letter of June 13.

The statements, prepared by Henry W. Coulter of the Geologic Division and Eric L. Meyer of the Water Resources Division, have been discussed with members of your staff.

We have no objection to your making these statements a part of the public record.

Sincerely yours,

Acting Director

Enclosures

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Comments on the Geology and Hydrology of the
Consumers Power Company
Palisades Plant site
AEC Docket No. 50-255

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Hydrology

This review is based on the Palisades Plant preliminary description and safety analysis report by the Consumers Power Company (AEC Docket No. 50-255) and an independent check on published reports.

The site is on the eastern shore of Lake Michigan between Palisades Park and Van Buren State Park in Covert Township, Van Buren County, Michigan. The proposed reactor would draw about 1,100 cubic feet per second of cooling water from the lake and return it, heated by 10° F, and containing waste radionuclides in concentrations not to exceed those specified in 10 CFR 20.

The preliminary safety analysis reports the mean Lake Michigan level for the 105 years of record, 579 feet above mean sea level, mean monthly deviations which have ranged from -3.1 to +3.2 feet, and temporary surges which have been as high as 8 feet at the southern end of the lake. Most of the site is well above these levels, and would not be affected by lake level surges. Grade at the reactor building is 625 feet. The intake structure at grade 590 feet, however, may be exposed to wave action and ice shove. The design of the structure should take these forces into account.

Runoff into Lake Michigan is small in relation to its volume and the effects of effluents discharged into it will depend largely on the prevailing water circulation pattern, as locally modified by the plant itself.

Currents of Lake Michigan were studied by Ayers and others (1958) during 2-day periods in June and August, 1955. From this study it appears that northward flow immediately offshore at the site is likely to prevail during summer days. This flow would take the heated discharge past the shoreline of Van Buren State Park, which is 1,500 feet north of the cooling water exhaust jetty and past South Haven's water supply intake, which is 5½ miles north. The applicant has stated that current direction and velocity measurements will be made to determine the amount of dispersion to be expected under varying lake conditions. This information should be useful in estimating the effects of the effluent along the nearby shoreline and at the nearest water intake.

References

Ayers, J. C., and others, 1958, Currents and water masses of Lake Michigan: Great Lakes Research Inst. Pub. No. 3

Geology

Based on a review of the applicant's report (AEC Docket 50-255) and available literature, it appears that their regional geologic analysis is logically derived and presents an adequate appraisal of those aspects of the geology which would be pertinent to an engineering evaluation of the site.

Although it may be anticipated that earthquakes within the general region will continue to occur with approximately the same frequency and with approximately the same intensity with which they have been recorded during the past 100 years, there are no identifiable faults or other geologic structures which could be expected to localize earthquakes in the immediate vicinity of the site. The fact that the footings of the plant are to rest on saturated unconsolidated deposits rather than on bedrock suggests the possibility of some degree of seismic amplification.

As pointed out in Appendix D--Foundation Investigations, additional borings immediately beneath the proposed location of the structure will be required to delineate the type and distribution of materials there. This information will be necessary as a basis for computing bearing pressures and settlement parameters to be used in final foundation design.