ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

March 12, 1968

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C.

Subject: REPORT ON PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNITS 1 AND 2

Dear Dr. Seaborg:

At its ninety-fifth meeting, on March 7-9, 1968, the Advisory Committee on Reactor Safeguards completed a review of the application by the Northern States Power Company for authorization to construct nuclear generating plants Units 1 and 2 at its Prairie Island site, in Goodhue County, Minnesota. This project previously had been considered at Subcommittee meetings at the site on October 27, 1967 and in Washington, D. C. on March 1, 1968. During its review, the Committee had the benefit of discussions with representatives of the Northern States Power Company and their consultants, the Westinghouse Electric Corporation, and the AEC Regulatory Staff and their consultants. The Committee also had the benefit of the documents listed.

The Prairie Island site comprises approximately 560 acres located six miles northwest of the city of Red Wing, Minnesota, on the Mississippi River. Red Wing has a population of 10,500 while the Twin Cities metropolitan area, 28 miles northwest of the site, has a population of 1,700,000. The land surrounding the site is rural and agricultural.

The soils at the site consist of sandy alluvium, ranging in thickness from approximately 160 to 185 feet. Several hundred feet of sound sandstone bedrock underlie the site. The soil will be dewatered, excavated, classified and replaced to a depth of approximately 30 feet and compacted to a relative density of 85%.

The Prairie Island units are to be identical, two-loop, pressurized water reactors operated at maximum power levels of 1650 MWt. With respect to core design and other features of the nuclear steam supply system, the units are essentially duplicates of the Point Beach reactor. The units have a power level and average heat flux about 18% higher than the Point Beach reactor with a power density nearly that of the Diablo Canyon reactor.

Each reactor and its steam generators are enclosed in a structure which consists of a steel primary containment shell and a reinforced concrete vertical shield cylinder with a shallow dome. The applicant stated that the vacuum relief valves for the containment will be sized to accommodate simultaneous operation of the two spray subsystems and the four finned coolers.

The applicant has stated that protection will be afforded against the maximum probable flood.

The applicant has proposed using signals from protection instruments for control purposes. The Committee continues to believe that control and protection instrumentation should be separated to the fullest extent practicable. The Committee believes that the proposed protection system can and should be modified to eliminate or reduce to a minimum the interconnection of control and protection instrumentation. The modified system should be reviewed by the AEC Regulatory Staff.

The Committee continues to call attention to matters that warrant careful consideration with regard to recent reactors of high power density and other matters of significance for all large water-cooled power reactors. These matters, stated in our report to you of December 20, 1967 on Diablo Canyon, apply similarly to Prairie Island Units 1 and 2.

The Committee believes that, if due consideration is given to the foregoing items, and in view of the favorable site location, the nuclear units proposed for the Prairie Island site can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public.

Sincerely yours,

/s/
Carroll W. Zabel
Chairman

References Attached.

References - Prairie Island

1. Volumes 1, 2, and 3 - Prairie Island Nuclear Generating Plant, Facility Description and Safety Analysis Report, received September 1, 1967.

2. Supplement No. 1 to Application for Licenses, Prairie Island Nuclear Generating Plant, Facility Description and Safety Analysis Report, received September 1, 1967.

3. Northern States Power Company letter, dated August 24, 1967, transmitting Amendment No. 1 to the Construction Permit and Operating License Application.

4. Northern States Power Company letter, dated December 15, 1967, transmitting Amendment No. 2 to the Construction Permit and Operating License Application.

5. Volume 4, Prairie Island Nuclear Generating Plant, Facility Description and Safety Analysis Report, Appendices J, K and L, received December 28, 1967.

6. Northern States Power Company letter, dated January 12, 1968, transmitting Amendment No. 3 to the Construction Permit and Operating License Application.

7. Northern States Power Company letter, dated February 15, 1968, transmitting Amendment No. 4 to the Construction Permit and Operating License Application.

8. Northern States Power Company letter, dated February 27, 1968, transmitting Amendment No. 5 to the Construction Permit and Operating License Application.

9. Northern States Power Company letter, dated March 6, 1968, transmitting Amendment No. 6 to the Construction Permit and Operating License Application.