ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 11, 1975

Honorable William A. Anders
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: REPORT ON THE TYRONE ENERGY PARK, UNIT NO. 1

Dear Mr. Anders:

During its 188th meeting, December 4-6, 1975, the Advisory Committee on Reactor Safeguards reviewed the application of the Northern States Power Company of Wisconsin and the Northern States Power Company of Minnesota (Applicants) for a permit to construct the Tyrone Energy Park, Unit No. 1. A visit to the site of the proposed plant was made on November 20, 1975, and a Subcommittee meeting was held at Eau Claire, Wisconsin on November 21, 1975. The "Standardized Nuclear Unit Power Plant System" (SNUPPS), to be utilized at the Tyrone Energy Park site and at three other plant sites, was reviewed at Subcommittee meetings held at Washington, DC, on August 19, 1975, and at Emporia, Kansas on September 26, 1975, and at the 185th meeting of the Committee, September 11-13, 1975, and the 186th meeting of the Committee, October 9-11, 1975. During its review of the Tyrone Energy Park Unit 1, the Committee had the benefit of discussions with the Nuclear Regulatory Commission (NRC) Staff and representatives and consultants of the Applicants, the Westinghouse Electric Corporation, the Bechtel Power Corporation, and Commonwealth Associates, Inc. The Committee also had the benefit of the documents listed.

The Tyrone unit will be located on a 4597-acre site of partially wooded rural land about 19 miles southwest of Eau Claire, Wisconsin, the nearest population center (1970 population: about 45,000). The exclusion area has a minimum boundary distance of 1470 meters from the reactor centerline. The radius of the low population zone is 2.5 miles.

The SNUPPS will utilize the RESAR-3 Consolidated Version, four-loop, pressurized water reactor with a core power output of 3411 MW(t). This design is similar to that utilized at the Comanche Peak Steam Electric Station, Units 1 and 2, reported on by the Committee in its report of October 18, 1974. The Committee's review of the SNUPPS was reported on in its Callaway letter of September 17, 1975, and is further reported on in this letter.

The NRC Staff has identified several items in the Tyrone application the reviews for which are not yet completed. The Committee recommends that any outstanding issues which may develop in the course of completing these reviews be dealt with in a manner satisfactory to the NRC Staff. The Committee wishes to be kept informed on the resolution of the following items:

1. The analyses of the effects of anticipated transients without scram.

2. The evaluation of the plant design to meet the requirements of Appendix I of 10 CFR Part 50.

The RESAR-3 Consolidated Version nuclear design utilizes assemblies with the 17x17 fuel rod array. Westinghouse has completed an integrated test program to confirm safety margins associated with this design. The last of a series of reports on this program is expected soon. The RESAR-3 reactor core design has been analyzed by Westinghouse with respect to stability against radial xenon oscillations. Westinghouse has agreed to verify this stability in startup physics tests for a 193 fuel assembly core similar to SNUPPS. The Committee will continue to review these matters as appropriate documentation is submitted.

The Committee recommended in its report of September 10, 1973, on acceptance criteria for ECCS, that significantly improved ECCS capability should be provided for reactors for which construction permit requests are filed after January 7, 1972. The SNUPPS design is in this category. These units will use assemblies with a 17x17 fuel rod array similar to those to be used in Comanche Peak Steam Electric Station, Units 1 and 2. Although calculated peak clad temperatures in the event of a postulated LOCA are less for assemblies with a 17x17 than with a 15x15 fuel rod array, the Committee believes that the Applicants and the reactor vendors should actively pursue studies that are responsive to the Committee's September 10, 1973 report. If studies establish that significant further ECCS improvements can be achieved, consideration should be given to their incorporation into the Tyrone unit.

Although the NRC Staff has concluded that the Applicants will comply with the Final Acceptance Criteria for the Emergency Core Cooling Systems, the Committee wishes to be kept informed on the resolution including possible effects from rod bowing.

The Committee believes that the Applicants and the NRC Staff should continue to review the Tyrone plant design for features that could reduce the possibility and consequences of sabotage.

The Committee recommends that the NRC Staff and the Applicants review the design features that are intended to prevent the occurrence of damaging fires and to minimize the consequences to safety-related equipment should a fire occur. The Committee wishes to be kept informed.

Generic problems relating to large water reactors are discussed in the Committee's report dated March 12, 1975. These problems should be dealt with appropriately by the NRC Staff and the Applicants.

The Advisory Committee on Reactor Safeguards believes that the items mentioned above and the items mentioned in its Callaway report, which are relevant to the Tyrone application, can be resolved during construction and that if due consideration is given to the foregoing, the Tyrone Nuclear Energy Park, Unit No. 1 can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely yours,

W Kerr

W. Kerr
Chairman

References

1. SNUPPS Preliminary Safety Analysis Report with Revision 1 through 13 and the Tyrone Site Addendum Report with Revision 1 through 6.

2. RESAR-3 Consolidated Version, Westinghouse Safety Analysis Report with Amendments 1 through 6.

3. Safety Evaluation Report, NUREG-75/102 related to the Construction of Tyrone Energy Park, Unit No. 1, Docket No. STN 50-484, October 1975.

4. Letter dated November 21, 1975, from Mrs. Galen C. Radle to Advisory Committee on Reactor Safeguards, Nuclear Regulatory Commission.

5. Supplement No. 1 to the Safety Evaluation Report, NUREG-75/076 related to Construction of Callaway Plant Units 1 and 2, Docket Nos. STN 50-483 and STN 50-486, November 1975.