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

Aug. 17, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON FORKED RIVER NUCLEAR GENERATING STATION-UNIT 1

Dear Dr. Schlesinger:

At its 148th meeting, August 10-12, 1972, the Advisory Committee on Reactor Safeguards completed its review of the application of the Jersey Central Power and Light Company to construct the Forked River Nuclear Generating Station-Unit 1. This project was considered at Subcommittee meetings on June 27, 1972, at the site, and on August 4, 1972, in Washington, D. C. During its review, the Committee had the benefit of discussions with representatives and consultants of the Jersey Central Power and Light Company, the GPU Service Corporation, Combustion Engineering, Incorporated, Burns and Roe, Incorporated, the Stearns-Roger Corporation, and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed.

Forked River Unit 1 will be located on a 1425-acre site in Ocean County, New Jersey. The approximately rectangular site extends a distance of 3.3 miles from Barnegat Bay on the east to the Garden State Parkway on the west and, except near the Bay, is about 0.8 mile wide. The station will be located approximately 3500 feet from the western site boundary and the same distance west of the applicant's existing nuclear power station, Oyster Creek Unit 1.

The nuclear steam supply system will be provided by Combustion Engineering and will include a 3390 MWt pressurized water reactor essentially identical to those to be provided for San Onofre Units 2 and 3, previously reviewed and reported on in the Committee's letter of July 21, 1972. The average mass velocity of coolant, design peaking factors, and linear power are the same for these three reactors as for the smaller reactor of the Arkansas Nuclear One Unit 2 (ANO-2), reported on in the Committee's letter of February 10, 1972. The Committee reiterates that adequate confirmation of the predicted core performance must be obtained to justify the higher power densities of this reactor, San Onofre Units 2 and 3, and ANO-2.

The emergency core cooling systems (ECCS) for this reactor have been evaluated by the applicant using the approved Combustion Engineering evaluation model for use with the "Interim Acceptance Criteria for Emergency Core Cooling Systems for Light Water Power Reactors". The applicant has agreed to design the Forked River Unit 1 ECCS in accordance with results of studies similar to those being conducted by Combustion Engineering for the ANO-2 facility. The final design should be reviewed by the Regulatory Staff and the ACRS prior to fabrication and installation of major components.

The applicant intends to use prepressurized fuel, citing benefits of lower fuel temperatures and control of cladding creep. The Committee reserves judgement on the benefits of pressurized fuel under normal and possible accident conditions. The Regulatory Staff should complete its analyses of pressurized fuel. The Committee wishes to be kept informed.

The Committee recommends that the applicant give careful attention to the use and improvement of instrumentation capable of providing continuing quantitative information on the local performance characteristics of high power density cores.

The applicant's current calculations indicate that the core may be only marginally stable against azimuthal xenon oscillations. The Committee recommends that possible modifications in design or operating mode to obviate azimuthal instability be developed for use if later studies indicate that such instability is likely with the existing core design.

The Committee understands that the Regulatory Staff is reviewing the adequacy of the proposed design pressure for the reactor containment building. The Committee wishes to be kept informed.

The circulating water system for heat removal from the main turbine condenser will employ a salt-water, natural draft cooling tower for heat rejection. This will be the largest salt-water cooling tower yet constructed in this country. The applicant has conducted an extensive study of salt spray carryover in the effluent air plume and the effects of the expected carryover on the equipment and on the plant environment; he concludes that the carryover will be adequately low. The Committee believes that attention should be given during the design to the effect of higher than anticipated salt spray carryover on the performance and reliability of exposed safety related electrical equipment.

The applicant concludes that contamination of the ground water from accidental spills and leaks will be intercepted and diluted by onsite streams and channels and cannot reach offsite wells. The Committee

recommends that additional studies, including the establishment of off-site monitoring wells near the plant, should be undertaken to verify the applicant's conclusions. These studies should be carried out in a manner satisfactory to the Regulatory Staff.

The applicant's quality assurance program appears to be generally satisfactory. He has recently proposed additional measures to further strengthen this very important program. These measures should be implemented in a manner satisfactory to the Regulatory Staff prior to start of construction.

The Committee reiterates its previous comments concerning the need to study further means of preventing common mode failures from negating reactor scram action, and the design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee believes it is desirable to expedite these studies and to implement in timely fashion such design modifications as are found to improve significantly the safety of the plant in this regard. The Committee wishes to be kept informed of the resolution of this matter.

Other problems relating to large water reactors, which have been identified by the Regulatory Staff and the ACRS and cited in previous reports, should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed.

The Advisory Committee on Reactor Safeguards believes that the items mentioned above can be resolved during construction and that, if due consideration is given to the foregoing, the Forked River Nuclear Generating Station-Unit 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,

C. P. Siess

C. P. Siess
Chairman

References:

1. Volumes 1 through 6 of the Forked River Nuclear Generating Station-Unit 1 Preliminary Safety Analysis Report

2. Amendments 1 through 20 to the License Application