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

July 21, 1972

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

Subject: REPORT ON SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 AND 3

Dear Dr. Schlesinger:

At its 147th meeting, July 13-15, 1972, the Advisory Committee on Reactor Safeguards completed its review of the application of the Southern California Edison Company and the San Diego Gas and Electric Company to construct San Onofre Nuclear Generating Station Units 2 and 3. This project also was considered at Subcommittee meetings on January 19, 1971, at the site; July 6, 1971, in Washington, D. C.; June 19-20, 1972, in Menlo Park; and at the 135th Committee meeting, July 8-10, 1971. During its review the Committee had the benefit of discussions with representatives and consultants of the Southern California Edison Company, the San Diego Gas and Electric Company, Combustion Engineering, the Bechtel Corporation, and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed.

San Onofre Units 2 and 3 will be located adjacent to Unit 1 on the Pacific Coast near the northern boundary of Camp Pendleton, California. The reactors will be constructed on an 84-acre site about two and one-half miles from the nearest boundary of San Clemente, a town of approximately 18,000 people; the nearest city is Oceanside (population 39,000), 17 miles southeast. The site is within the Camp Pendleton Reservation and fronts on the Pacific Ocean. U. S. Highway 101 and the Atcheson, Topeka and Santa Fe Railway pass through Camp Pendleton approximately one-eighth mile from the reactors.

The proposed pressurized water reactors for Units 2 and 3 have design power levels of 3390 MW(t) each, 23 percent greater than Arkansas Nuclear One Unit 2 (ANO-2). Coolant average mass velocities, average linear power and flux peaking factors are the same as those for ANO-2, previously reviewed and reported in the Committee's letter of February 10, 1972. The Committee reiterates that adequate confirmation of the designer's expectations must be obtained to justify the higher power densities of these reactors and ANO-2.

The emergency core cooling systems (ECCS) for these reactors 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 San Onofre 2 and 3 ECCS in accordance with 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 in lower fuel temperatures and control of cladding creep. The Committee reserves judgment on the benefits of prepressurized fuel under normal and possible accident conditions. The Regulatory Staff should complete its analyses of prepressurized fuel. The Committee wishes to be kept informed.

The applicant has agreed to meet the Regulatory Staff requirements for a Safe Shutdown Earthquake producing ground accelerations of 2/3g with occasional peaks up to 3/4g, and has proposed suitably amplified response spectra for use in design. Since the peaks above 2/3g are expected to be nonperiodic, they have no significant effect on the design spectra. The design includes lowered vertical profiles and separate foundation mats for structures such as containment, fuel pools, and the control room. The Regulatory Staff should review the design of these structures. The applicant is reviewing the effect of a severe offshore earthquake on the height of a tsunami and will provide appropriate protection against wave runup.

The applicant has indicated that he is considering studies similar to those made at San Onofre Unit 1 to determine the vibration characteristics of the major reactor components and the response of safety instrumentation to seismic loadings. The Committee encourages such experimental verification of the anticipated behavior of important components and instruments during earthquakes. The Committee suggests that a program be developed prior to reactor operation to guide or implement decisions concerning reactor operation in the event of a large earthquake in the region of the site.

The applicant has concluded that the likelihood of seismic surface displacement at the plant site is negligible. In addition, the applicant intends to establish the absence of seismically induced branch fault indications at the site during construction excavation. The Committee agrees that if, as anticipated, no such faults are found, the probability of ground displacement at the plant location is negligible.

The applicant has agreed to meet the Regulatory Staff requirements pertaining to appropriate tornado design criteria for the plant at this location. The Committee agrees that San Onofre 2 and 3 should meet suitable criteria and wishes to be kept informed concerning the resolution of this matter.

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

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

The applicant's quality assurance program appears generally satisfactory. However, the Committee suggests that the responsibility of the Chief Quality Assurance Engineer with respect to the functions of the Quality Control Engineer be precisely defined, since the two functions currently report to different organizational groups.

The Committee reiterates its previous comments concerning the need to study further means of preventing common mode failures from negating reactor scram action, and design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee believes it 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, San Onofre Nuclear Generating Station Units 2 and 3 can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public.

Sincerely yours,

C. P. Siess

C. P. Siess
Chairman

Attachment:
References

References

1. Southern California Edison Company letters, May 28, 1970, and February 24, 1971, forwarding Vols. 1 through 4 and Vol. 5, respectively, Preliminary Safety Analysis Report for San Onofre Nuclear Generating Station Units 2 and 3

2. Amendments 1 through 13 to the License Application