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

October 8, 1966

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

Subject: REPORT ON SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1

Dear Dr. Seaborg:

At its seventy-second, seventy-seventh, and seventy-eighth meetings, the Advisory Committee on Reactor Safeguards reviewed the proposed operation of San Onofre Nuclear Generating Station, Unit 1, at power levels up to 1347 MW(t) under a provisional operating license. This project was previously discussed by the Committee in its report of September 12, 1963. In its current review, the Committee had the benefit of discussions with representatives of the Southern California Edison Company, Westinghouse Electric Corporation, Bechtel Corporation, Southwest Research Institute, and the AEC Regulatory Staff, and of the documents listed. A Subcommittee of the ACRS met on five occasions to review proposed San Onofre operation. One of these meetings included a visit to the plant site.

The San Onofre plant is the first of a new generation of power reactors to be reviewed for an operating license, and represents an increase by a factor of more than two in power level over licensed pressurized water reactors now operating. As described in the Committee's previous report, Unit 1 is a pressurized, light water reactor located on an approximately 84-acrs site on the Pacific Coast, within and near the northern boundary of the Camp Pendleton Marine Corps Base, at a point 2.5 miles from the edge of the community of San Clemente, California. The applicant has provided a 28-foot high sea wall for protection against tsunamis.

The plant is contained within a 140-foot diameter steel sphere, designed to withstand an internal pressure of approximately 46 psig, and to meet a 0.1% per day initial leakage rate. A schedule of periodic containment integrated leak rate and containment penetration testing has been established.

The core consists of a cylindrical configuration of stainless steel clad, enriched uranium dioxide pellet, fuel assemblies. Control is achieved by means of 45 absorber-rod cluster assemblies which are operated in groups, and by boron dissolved in the primary coolant. The applicant's analysis indicates an adequate safety margin in core thermal design, although the core is more advanced in this respect than those of other reactors of this type now operating.

A borated water safety injection system, supplied from a 240,000-gallon tank, has been provided to protect the core in the unlikely event of a major loss-of-coolant accident. In addition, high pressure pumps provide protection against smaller primary system breaks. These installed systems will be tested prior to core loading. Off-site power is required to operate the feedwater pumps in the safety injection trains. The applicant has stated that the reliability and continuing availability of off-site power sources will be carefully tested at suitable intervals. Two auxiliary diesel generators will be provided, to assure the availability of power for shutdown heat removal and for the containment spray system. These diesels also supply power to an electrically-driven pump which is being provided as back-up to the steam-driven feedwater pump.

The reactor pressure vessel, which is 37 feet high and about 160 inches in diameter, is fabricated from stainless steel clad, low alloy steels. The maximum fast neutron dose is calculated to be about 6×10^{19} nvt over a 30-year vessel life. A surveillance program is planned, employing eight capsules containing specimens of vessel materials, located between the thermal shield and the reactor vessel. The Committee recommends that the Regulatory Staff assess the results of this program very carefully.

A program for periodic inspection of the primary coolant system has been proposed by the applicant. The Committee believes that this represents a generally sound approach but may wish to review aspects of this program, particularly the frequency and extent of inspections, at the time of final licensing review.

The applicant will provide separate cabinets for the pressurizer level and pressure control transmitters to decrease the likelihood of simultaneous failure of these channels.

It is the opinion of the ACRS that this reactor can be operated as proposed under a provisional operating license without undue hazard to the health and safety of the public.

Sincerely yours,

/s/ D. Okrent

David Okrent
Chairman

References attached.

References - San Onofre.

1. "Final Engineering Report, San Onofre Nuclear Generating Station, Unit No. 1; Section 4, Paragraph 4.2; Section 11, Paragraph 11.1", with errata sheet, undated, received November 10, 1965.

2. Amendment No. 8, Application for Provisional Operating License, dated November 12, 1965 transmitting Final Engineering Report and Safety Analysis, Volumes I-III.

3. Southern California Edison Company letter dated September 24, 1965 to AEC Division of Reactor Licensing transmitting Marine Advisors Report, "Examination of Tsunami Potential at the San Onofre Nuclear Generating Station".

4. Southern California Edison Company letter dated November 1, 1965 to AEC Division of Reactor Licensing, with enclosures.

5. Supplement No. 1 to the Final Engineering Report and Safety Analysis, dated March 23, 1966.

6. Westinghouse Heat Transfer Apparatus Report, "Evaluation of Damage, San Onofre Steam Generator", dated January 1966 - Revised April 1966.

7. Supplement No. 2 to the Final Engineering Report and Safety Analysis, transmitted by Amendment No. 11 dated May 20, 1966.

8. Technical Specifications, undated, received June 24, 1966.

9. Southern California Edison Company letter dated August 8, 1966 to AEC Division of Reactor Licensing, with enclosures.

10. Amendment No. 13, dated August 12, 1966, with attached Supplement No. 3 to the Final Engineering Report and Safety Analysis.