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

June 18, 1971

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON TURKEY POINT NUCLEAR GENERATING PLANT UNITS 3 AND 4

Dear Dr. Seaborg:

At its 134th meeting, June 10-12, 1971, the Advisory Committee on Reactor Safeguards completed its review of the application of Florida Power and Light Company for authorization to operate Turkey Point Nuclear Generating Units 3 and 4 at power levels up to 2200 MW(t). This project had been considered previously at the 127th, 131st, and 132nd Committee meetings of November 12-14, 1970, March 4-6, 1971, and April 1-3, 1971, respectively, and at Subcommittee meetings at the site on November 7, 1970 and March 19, 1971. During its review, the Committee had the benefit of discussions with representatives of Florida Power and Light Company, Westinghouse Electric Corporation, Bechtel Corporation, and the Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed. The Committee reported to you on the construction of these units in its letters of January 18, 1967 and May 15, 1968.

Turkey Point Units 3 and 4 are located in Dade County, Florida on the west shore of Biscayne Bay approximately 25 miles south of Miami. They share the site with two oil and gas fired units. Each nuclear unit employs a pressurized water reactor in a three-loop nuclear steam supply system of essentially the same design as the H. B. Robinson Unit No. 2, previously reviewed.

The containment structure for each unit consists of a steel-lined concrete cylinder with a flat base and a shallow domed roof. The wall is prestressed with vertical and horizontal tendons; the dome is prestressed with a three-way tendon system.

During construction, the concrete in a portion of the Unit 3 containment building dome was found to contain extensive cracks parallel to and at depths as much as 15 inches below the outer surface. The applicant, together with his contractor and consultants, developed and implemented procedures for removing the damaged concrete; repairing or replacing tendon sheaths, tendon wires, and reinforcing bars damaged during the concrete removal; replacing the concrete; and, retensioning the tendons. Although the reasons for the cracking have not been established conclusively, several possible mechanisms have been identified and measures have been taken to prevent their recurrence. The Committee believes that the repairs made, together with the much more frequent and more extensive surveillance program which will be carried out, provide reasonable assurance that the containment will be able to perform its design function in the unlikely event of a loss-of-coolant accident.

The applicant states that he intends to operate Units 3 and 4 in such a manner as to assure that maximum fuel rod linear power does not exceed 15.8 KW/ft at full reactor power of 2200 MW(t). Performance of the emergency core cooling system (ECCS) during postulated loss-of-coolant accidents has been reevaluated in the light of results from the Commission's FLECHT program, experiments and analyses by the applicant and his contractors, and information developed by the Regulatory Staff in recent studies of ECCS. The Committee believes that the indicated performance is satisfactory.

Conservative pressure-temperature relationships should be established to cover reactor start-up and shut-down. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

The Committee reiterates its previous comments concerning the need to study further means of preventing common mode failures from negating reactor scram action, and of 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.

The applicant proposes to use a purging technique to control the buildup of hydrogen in the containment that could follow in the unlikely event of a loss-of-coolant accident. Installation of the purge system should be completed prior to start of routine operation. The Regulatory Staff should assure itself that the design criteria for the system are consistent with those for other engineered safety features.

An extensive integrated program for measuring vibration of reactor vessel internals and primary system components is being carried out on several previously licensed pressurized water reactors. The Committee believes that some confirmatory vibration measurements are desirable for the Turkey Point Units, as for all reactors. The Regulatory Staff should review the results of vibration measurements on other plants with regard to their applicability to Turkey Point and should determine the confirmatory measurements to be made.

Other problems relating to large water reactors which have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS 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, if due regard is given the items mentioned above, and subject to satisfactory completion of construction and pre-operational testing, there is reasonable assurance that the Turkey Point Nuclear Generating Units 3 and 4 can be operated at power levels up to 2200 MW(t) without undue risk to the health and safety of the public.

Sincerely yours,

Spencer H. Bush

Spencer H. Bush
Chairman

References

1) Supplement Nos. 17 through 28 and 30 through 36 to the application and Final Safety Analysis Report
2) Florida Power & Light Company letter dated December 23, 1970 transmitting a report describing the distress observed in Turkey Point Unit 3 containment dome
3) Florida Power & Light Company letter dated January 25, 1971 transmitting a report describing the concrete replacement program for the Turkey Point Unit 3 containment dome
4) Florida Power & Light Company letter dated April 22, 1971 transmitting Security Plan for Turkey Point Units 3 and 4