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

March 12, 1970

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

Subject: REPORT ON HUTCHINSON ISLAND PLANT UNIT NO. 1

Dear Dr. Seaborg:

At its 119th meeting, March 5-7, 1970, the Advisory Committee on Reactor Safeguards completed its review of the application of the Florida Power and Light Company for authorization to construct a nuclear power plant at its Hutchinson Island site in St. Lucie County, Florida. A Subcommittee visited the site on January 5, 1970; a second Subcommittee meeting was held in Chicago on February 21, 1970. During its review, the Committee had the benefit of discussions with the applicant, Combustion Engineering, Inc., Ebasco Services, Inc., the AEC Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed.

The Hutchinson Island Plant Unit No. 1 will be located on a tract of land of approximately 1100 acres, about half way between Fort Pierce and Stuart on the east coast of Florida. About 1000 people live within a five mile radius of the site. The nearest population center is Fort Pierce (population about 34,000), which is eight miles away.

The plant site on Hutchinson Island is underlain by sand to a depth of several hundred feet. To provide satisfactory bearing and settlement characteristics and resistance to liquefaction, the first sixty feet of loose send is being removed and the excavation refilled to foundation depth with granular material compacted to a relative density of 85 percent.

The proposed pressurized water reactor has a design power level of 2440 MW(t) and is similar to the previously reviewed Maine Yankee and Calvert Cliffs reactors (ACRS reports dated July 19, 1968 and March 13, 1969). The containment system consists of a steel containment vessel enclosed within a reinforced concrete building, with the annular space maintained at a slight negative pressure and exhausted through filters. The applicant has stated that the containment and other structures and systems important to safety will be designed to meet the same tornado

design criteria as have been used for other recently reviewed plants, and that protection of vital components will be provided against the probable maximum hurricane-induced flood and runup level as estimated by the Coastal Engineering Research Center.

The applicant stated that a dynamic seismic analysis will be performed on the primary system. Several other matters related to seismic design, including the spectra to be used in the design of piping and equipment, and the design procedures to be used for various types of Class 1 piping, should be resolved in a manner satisfactory to the Regulatory Staff.

The applicant stated that the primary system will be designed so that annealing of the pressure vessel will be practical at a temperature of at least 650° F.

Pump seal and other leakage from emergency core cooling (ECCS) equipment and lines outside the containment may lead to undesirable releases of radioactivity in the unlikely event of a loss-of-coolant accident. The Committee recommends that the atmosphere around the ECCS lines and pumps outside the containment be vented through a charcoal filter system.

Further study is required with regard to potential releases of radioactivity in the unlikely event of gross damage to an irradiated subassembly during fuel handling and the possible need for a charcoal filtration system in the fuel handling building. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

All hot process lines penetrating the containment annulus will be designed with a guard pipe to direct steam flow back to the primary containment in the unlikely event of a rupture of the process pipe in the annulus region. In view of the importance of the guard pipes, the applicant will arrange for an independent review of the design.

The applicant stated that he will install a concrete wall in the containment penetration room to separate the cables and penetrations for redundant devices essential to safety. The Committee believes that the separation of redundant elements in the penetration room and elsewhere requires further study, as to both criteria and design details.

A suitable preoperational vibration testing program should be employed for the primary system. Also, attention should be given to the development and utilization of instrumentation for in-service monitoring for excessive vibration or loose parts in the primary system.

When details of the planned loads and ratings of the emergency diesel generators become available, the Regulatory Staff should assure itself that adequacy of design conservatism is realized and that sufficient testing and experience will be available prior to plant startup to prove the reliability of the emergency power system.

The Committee reiterates its interest in active participation by applicants in overall quality assurance programs to better assure the construction of safe plants. In this regard, a greater level of direct participation by the applicant in the quality assurance program of the Hutchinson Island Plant would be desirable.

Information on a number of items, identified in previous reports of the Committee, is to be provided by the applicant to the Regulatory Staff during construction. These include:

a) A study of means of preventing common failure modes from negating scram action and of design features to make tolerable the consequences of failure to scram during anticipated transients.

b) Review of development of systems to control the buildup of hydrogen in the containment, including an appropriately conservative estimate of possible hydrogen sources, and of instrumentation to monitor the course of events in the unlikely event of a loss-of-coolant accident.

Other problems related to large water reactors have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS reports. The Committee feels that resolution of these items should apply equally to the Hutchinson Island Plant.

The Committee believes that the above items can be resolved during construction and that, if due consideration is given to these items, the nuclear plant proposed for the Hutchinson Island site can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely yours,

/s/

Joseph M. Hendrie
Chairman

References attached.

References - Hutchinson Island Plant Unit No. 1

1. Hutchinson Island Plant Unit No. 1, Preliminary Safety Analysis Report, Volumes 1 - 3.

2. Florida Power & Light Company letter, dated April 1, 1969.

3. Amendments 1 - 8 to License Application.