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

December 17, 1971

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

Subject: REPORT ON LA SALLE COUNTY STATION, UNITS 1 AND 2

Dear Dr. Schlesinger:

At its 140th meeting, December 9-11, 1971, the Advisory Committee on Reactor Safeguards completed its review of the application from Commonwealth Edison Company for a permit to construct the La Salle County Station, Units 1 and 2. Unit 2 is scheduled for operation about one year after Unit 1. This project was considered at Subcommittee meetings on November 23, 1971, at the plant site, and on December 8, 1971, in Washington, D. C. During its review, the Committee had the benefit of discussions with the applicant, Sargent and Lundy, the General Electric Company, and the AEC Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed.

The La Salle County Station will be located in north-central Illinois, in a rural area of large farms about 65 miles southwest of Chicago. The nearest towns to the site are Seneca, 5 miles distant, and Marseilles, 6 miles from the site, with estimated 1975 populations of 2,210 and 5,360 respectively. Several towns with populations of 10,000-20,000 are within 30 miles of the site. Joliet, with an estimated 1975 population of 123,800 is 37 miles to the northeast.

The minimum exclusion distance from the stack is 667 meters (2,190 ft.) and from the center of the reactor building is 515 meters (1,690 ft.). The low population zone radius is 4 miles. This zone had a 1970 population of less than 720.

The La Salle County Station will contain two General Electric boiling water reactors, each to be operated at a power level of 3293 MWt. These reactors are similar to the smaller capacity reactors recently reviewed for the Zimmer Station and for the Bailly Station.

The La Salle County Station site has an area of about 7,000 acres. Of this, about 4,500 acres will be converted to a cooling lake, contained in part by dikes up to about 45 feet in height. A portion of the lake will be designed as a 75-acre emergency cooling pond contained by a Class 1 submerged dike. Water to maintain the lake will be taken from the Illinois River about 4 miles to the north and blowdown will be returned to the Illinois River. The cooling lake will have an elevation of 700 feet MSL. The Illinois River has an elevation of about 485 feet MSL. The applicant states that the cooling lake and the connections to the river are designed to accommodate the future addition of two large generating units to the La Salle County Station.

The cooling lake and the plant site are underlain by glacial till some 165 feet thick. The till is compact and impervious. The plant foundations will be on concrete mats supported by the till.

Current analysis indicates acceptably low peak clad temperatures following a postulated loss-of-coolant accident. A blowdown research program, which was recently begun under the auspices of General Electric and the USAEC, should provide more detailed knowledge of the flow and heat transfer processes during the first stages of such postulated accidents. More detailed analytical studies, particularly as they relate to the time to minimum critical heat flux ratio and the level swell process, should also be performed during construction of the plant. The results of these studies should be reviewed by the Regulatory Staff.

The applicant proposes not to provide vacuum relief valves between the containment and the reactor building because of the capability of the concrete containment structure to withstand substantial external pressure. The elimination of the need for vacuum relief valves is desirable. The containment design for external pressure should be carried out in a conservative manner.

The applicant has stated that he will comply with AEC Safety Guide 7, Control of Combustible Gas Concentrations in Containment Following a Loss of Coolant Accident.

The applicant proposes to install a sealing system, designed as an engineered safety feature, to minimize leakage through the main steam line isolation valves. The Committee believes that this sealing system should be installed, and in addition, that the main steam lines should be designed and analyzed in a manner which assures their integrity during a design basis earthquake. These matters should be resolved in a manner satisfactory to the Regulatory Staff.

The applicant has studied design features to make tolerable the consequences of failure to scram during anticipated transients, and has concluded that automatic tripping of the recirculation pumps could provide a suitable backup to the control rod system for this type of event. The Committee believes that this recirculation pump trip represents a substantial improvement and should be provided for the La Salle County Station. However, further evaluation of the sufficiency of this approach and the specific means of implementing the proposed pump trip should be made. This matter should be resolved in a manner satisfactory to the Regulatory Staff and the ACRS during construction of the reactor.

Analyses are being made to determine whether the effectiveness of the ECCS will be decreased if the recirculation control valves or the pump discharge block valves should close following a break in a recirculation line. If significant adverse effects on the ECCS effectiveness are revealed by the analyses, circuits and interlocks, designed to meet the IEEE-279 requirements, should be provided to assure that these valves will remain in the "as-is" condition.

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 believes that resolution of these items should apply equally to the La Salle County Station.

The Committee believes that the items mentioned above can be resolved during construction and that, if due consideration is given to these items, the La Salle County Station, Units 1 and 2, can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely yours,

Spencer H. Bush

Spencer H. Bush
Chairman

References:

1) Commonwealth Edison Company letter dated November 3, 1970 transmitting Preliminary Safety Analysis Report, Volumes 1 through 5 to the La Salle County Station, Units 1 and 2

2) Amendments 1, 4, 5, 6, to the License Application of Commonwealth Edison Company for the La Salle County Station, Units 1 and 2