ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
May 12, 1975

Honorable William A. Anders
Chairman
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: REPORT ON PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2

Dear Mr. Anders:

At its 181st meeting, May 8-10, 1975, the Advisory Committee on Reactor Safeguards completed its review of safety matters related to a proposal by the Cleveland Electric Illuminating Company, the Duquesne Light Company, the Ohio Edison Company, the Pennsylvania Power Company, and the Toledo Edison Company (the Applicants) to design and install a permanent dewatering system which will lower the existing groundwater level during the construction phase and during the operating lifetime of the Perry Nuclear Power Plant, Units 1 and 2. The system was also considered at a Subcommittee meeting held at Painesville, Ohio, on April 25, 1975. During its review, the Committee had the benefit of discussions with representatives of the Applicants, their consultants and contractors, and representatives of the NRC Staff. The Committee also had the benefit of the documents listed.

The Committee previously reported on the construction permit application for the Perry Nuclear Power Plant, Units 1 and 2, on December 12, 1974.

The Applicants later proposed, in Amendment 22 to the Preliminary Safety Analysis Report (PSAR), to reduce the groundwater level from the maximum natural elevation of 618 ft. mean sea level (MSL) to an elevation of 568.5 ft. MSL because calculations using the 618 ft. elevation indicated that the factors of safety against overturning of structures during an operating basis earthquake (OBE) and a safe shutdown earthquake (SSE) would be inadequate. The design was modified and described in greater detail in Amendment 23 to the PSAR. The proposed system is composed of two separate and redundant subsystems, the principal components of which include a porous blanket, porous concrete piping, pumps, and inspection manholes. One of the subsystems is a pumped-discharge subsystem,

not seismically qualified, which would maintain the groundwater at an elevation between about 566 and 568.5 feet MSL during normal operation. The other is a gravity drain subsystem, seismic Category I, which would maintain the groundwater at or below elevation 594 ft. MSL under the design basis accident (DBA) condition; the NRC Staff has defined the DBA for the dewatering system as the sudden release to the underdrain system of all the water stored on the site not contained by seismic Category I structures. The Applicants have committed to design all safety-related structures to withstand the hydrostatic head of the water table at 618 ft. MSL under normal operating conditions. There is agreement by the NRC Staff with the Applicants' estimate that there are adequate factors of safety against overturning of safety-related structures under OBE and SSE conditions with the water table at 594 feet. The Applicants have further committed to various actions including notification, remedial steps, and plant shutdown, depending on specific water levels exceeded.

The Applicants have not yet provided specifications for the design criteria of the porous concrete blanket, nor completed all the necessary physical and chemical tests of the pertinent geological strata on the plant site. These matters should be resolved in a manner satisfactory to the NRC Staff.

Methods of testing, monitoring, and maintaining the underdrain system performance as well as monitoring for and venting of methane gas accumulation (from natural occurrence) in the system should be resolved in a manner satisfactory to the NRC Staff.

The Committee believes that the proposed dewatering system design can provide a drawdown capability with adequate safety margin. To achieve and maintain the required performance capability, the Applicants' quality assurance program for the design, construction, and operation of the dewatering system should include special attention to protecting the porous concrete blanket against clogging and protecting the lower till and Chagrin shale against downgrading.

The Advisory Committee on Reactor Safeguards believes that the proposed permanent dewatering system is acceptable and, if due regard is given to the items mentioned above and in the Committee's letter of December 12, 1974, the Perry Nuclear Power Plant, Units 1 and 2, can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public.

Sincerely,

W. Kerr
Chairman

References:

1. The Cleveland Electric Illuminating Company (CEI), Preliminary Safety Analysis Report (PSAR), Amendments 22 and 23..

2. Supplement No.2 to the Safety Evaluation of the Perry Nuclear Power Plant Units 1 and 2 by the Office of Nuclear Reactor Regulation, USNRC, dated April, 1975..

3. Letter, Evelyn Stebbins (Coalition for Safe Electric Power) to Executive Secretary (ACRS), commenting on information not included in the Applicant's description of the underdrain system March 1, 1975.

4. Letter, Cleveland Electric Illuminating Co., reiterating and replying to questions from the NRC Staff on the proposed underdrain system, March 13, 1975.

5. Letter, Cleveland Electric Illuminating Co., reiterating and replying to questions from the NRC Staff on the proposed underdrain system, April 3, 1975.