DMB

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

P.O. BOX 5000 - CLEVELAND, OHIO 44101 - TELEPHONE (216) 622-9800 - ILLUMINATING BLDG. — 55 PUBLIC SQUARE

Serving The Best Location in the Nation

May 31, 1984

MURRAY R. EDELMAN
VICE PRESIDENT
NUCLEAR

Mr. James G. Keppler
Regional Administrator, Region III
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Evaluation of P72 System Porous
Concrete Pipes and Weepholes
[RDC 74(83)]

Dear Mr. Keppler:

This letter serves as our final report pursuant to 10CFR50.55(e) concerning our evaluation of partial blockage found in a number of porous concrete pipes and weepholes associated with the pumping drain system portion of the Pressure Relief Underdrain System (P72). Initial notification that this problem was being evaluated was made to Mr. P. R. Pelke of your office on June 10, 1983, by Mr. E. Riley of The Cleveland Electric Illuminating Company. Our interim reports were submitted on July 6, 1983, and October 25, 1983.

Description of Deficiency

Inspection of the underdrain system manholes revealed varying degrees of blockage in the 12" diameter porous concrete pipes and the weepholes due to calcium carbonate sedimentation. Additionally, the weepholes in the south wall of the Emergency Service Water Pump House were found in this condition. Nonconformance Report CQC 2770 was initiated to document the evaluation and resolution of this problem.

Completion of Evaluation

Since the original design of the Emergency Service Water Pumphouse assumed the weepholes through the exterior walls to be operative, it was decided that Gilbert Associates, Inc. would perform a structural analysis to determine if sufficient reserve capacity in the design existed without them. The new analysis utilized finite element techniques and was based on actual concrete compressive strength levels, as indicated by in-process test results. The results of the analysis conclusively demonstrate that the structure is capable of successfully withstanding all appropriate load combinations specified in the FSAR without benefit of a weephole system. FSAR Amendment 13, dated January 31, 1984, revised FSAR Section 3.8.5.3.4 to reflect this new design condition and eliminate reference to the weepholes.

JUN 4 1984

IE27
1/0

An investigation was performed by Construction Technology Laboratories (CTL), a Division of Portland Cement Association to address the mechanism of clogging and integrity of the porous concrete underdrain system. CTL stated that the clogging is caused by calcium carbonate sedimentation, and that the porous concrete is intact, of sound quality, and structurally suitable in accordance with the design requirements. CTL further concluded that the porous concrete will retain its strength throughout the life of the plant. Therefore, based on the above, it has been determined that all strength concerns are resolved and no further investigations with respect to its structural integrity are required.

With regard to concerns about the permeability of the porous concrete, hydrological testing has been performed on the underdrain system. The objective of the testing was to establish the continuity characteristics of the as-built underdrain system. This continuity testing involved introducing water into the system to specified elevations and then pumping it down. The water level elevations were monitored via piezometers located throughout the main plant area, and approximate level correlations to water depth in the underdrain manholes were developed. The data gathered from this monitoring showed that the water table within the system responded with acceptable uniformity to the build-up and drawdown cycles, and thus the system displayed acceptable continuity.

In addition, to establish the actual groundwater inflow rates imposed on the underdrain system, flow monitoring was performed during the month of April 1984. From this testing it was found that the groundwater inflow rates into the system averaged 12 gallons per minute. This value is much less than the design criteria inflow rate of 80 gpm and thus defines the substantial design margins of the system. It should be noted that the inflow testing was performed during a peak annual groundwater recovery period.

Future Maintenance

Continued system performance will be demonstrated utilizing trending of the results from the periodic hydrological testing described above. These testing procedures will be detailed in a pending FSAR revision to resolve SER Confirmatory Issue (54). Additionally, the monitoring program described in the FSAR, Section 2.4.13.5.3, and the maintenance and testing detailed in Section 2.4.13.5.4 will ensure that the pressure relief underdrain system is performing according to the design requirements for the life of the plant.

Analysis of Safety Implication

The technical specifications for the operation of the plant as set forth in the FSAR Section 2.4.13.5.1 require that, if the water level in the underdrain system manholes exceeds elevation 570.0 feet, the NRC shall be notified of that fact and remedial action taken. If the water level exceeds elevation 580.0 feet, the reactors shall be shut down and emergency action taken to reduce the water level. This requirement, combined with the monitoring/ testing of the P72 underdrain system, will ensure that hydrostatic uplift

pressures corresponding to design basis water level of 590.0 feet can never be exceeded. It has been determined therefore that, if this partial blockage had gone undetected, it would not have been detrimental to the safe operation of the Perry Nuclear Power Plant.

Please call if there are any additional questions.

Sincerely,

Cyril M. Shuster for

Murray R. Edelman
Vice President
Nuclear Group

MRE:pab

cc: Mr. J. A. Grobe
USNRC, Site Office

Mr. J. J. Stefano, Project Manager
Licensing Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

U.S. Nuclear Regulatory Commission
c/o Document Management Branch
Washington, D.C. 20555

Records Center, SEE-IN
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339