September 28, 1982

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
THE CLEVELAND ELECTRIC	)	Docket Nos. 50-440
ILLUMINATING COMPANY, ET AL.	)	50-441
	)	
(Perry Nuclear Power Plant, Units 1 and 2)	)	

APPLICANTS' ANSWER TO OHIO CITIZENS FOR RESPONSIBLE ENERGY FOURTH SET OF INTERROGATORIES TO APPLICANTS

Applicants for their answers to Ohio Citizens for Responsible Energy ("OCRE") Fourth Set of Interrogatories, dated September 7, 1982, state as follows:

All documents supplied to OCRE for inspection will be produced at Perry Nuclear Power Plant ("PNPP"). Arrangements to examine the documents can be made by contacting Mr. Ronald Wiley of The Cleveland Electric Illuminating Company at (216) 259-3737. Applicants will provide copies of any of the produced documents, or portions thereof, which OCRE requests, at Applicants' cost of duplication. Arrangements for obtaining copies can be made with Mr. Wiley.

RESPONSES

4-1. Please produce a copy of the following document identified in the response to OCRE interrogatory 1-12: "Evaluation of the Asiatic Clam Corbicula Fluminea in the Western Basin of Lake Erie," prepared by Ms. Jennifer Scott-Wasilk, Mr. Gary G. Downing, and Mr. Jeffrey S. Lietzow of Toledo Edison.

Response:

The document will be supplied for examination at PNPP.

4-2. Please list all documents in the possession of Applicants concerning the presence of Corbicula in Lake Erie. Produce all such documents (except those previously provided).

Response:

The following is a list of all documents Applicants have concerning the presence of Corbicula in Lake Erie that have not yet been provided:

(1) Scott-Wasilk, Downing, Clayton and Lietzow, "Environmental Survey for Corbicula at the Eastlake Power Plant," dated September 9, 1982, plus cover letter from Scott-Wasilk to Zucker, dated September 13, 1982.

(2) NUS Corporation report, "Preliminary Planning Considerations Regarding Corbicula at the Perry Nuclear Power Plant," dated December, 1981.

(3) Letter from Kovalak to Madsen, dated May 7, 1981.

(4) Memorandum from Zucker to Banks, dated May 19, 1981.

(5) Letter from Wells to Keppler, dated July 7, 1981.

(6) Letter from Scott-Wasilk to Kovalak, dated July 2, 1981.

(7) Letter from Stansberry to White, dated May 7, 1981, with cover letter from White to Szwejkowski, dated May 19, 1981.

(8) Letter from Davidson to Schwencer, dated June 18, 1981.

These documents will be supplied for examination at PNPP.

4-3. The "Corbicula Reconnaissance Survey" (May 1981) prepared for Applicants by NUS Corporation at p. 1 lists various methods for controlling Corbicula: chemical treatments, clam traps, mechanical cleaning devices, centrifugal separators, and magnetic water conditioners. Please provide a description of each of these methods with an assessment of their efficacy and their feasibility for use at Perry.

Response:

The "Corbicula Reconnaissance Survey" prepared by NUS Corporation noted the referenced control methods because they are either in use or being tested in the industry. No evaluation of their efficacy or feasibility for PNPP has been done. Some of the referenced control methods are described in a July, 1982, Power Magazine article. This article will be supplied for examination at PNPP.

4-4. The "Report on General Plans (Permit to Install and 401 Certification) for the Proposed Perry Nuclear Power Plant" (part of the Ohio EPA permit dated July 12, 1974) at p. 2 states that there will be no backwash of the intake. Considering the potential for clam biofouling at PNPP, do Applicants still believe this statement is true? Specifically, if flow blockage due to Corbicula in the intake were to occur, would Applicants consider backwashing the intake, possibly with heated water, to kill/remove the clams?

Response:

The statement still is true. No backwash of the intake is planned, largely because such an operation could not be accomplished without extensive modifications.

4-5. If backwashing is not contemplated, how would such a problem be corrected?

Response:

Because flow blockage due to Corbicula in the intake is not possible, Applicants have no plans at this time to correct "such a problem." The openings in the intake structure itself are too large to be blocked by Corbicula.

4-6. FSAR Section 9.2.1.2 states that the intake of water for the ESWS can be taken from the discharge structure if the normal intake becomes unavailable. What is the probability of this occurring?

Response:

Use of the discharge structure as an intake for the Emergency Service Water System would occur only if the intake tunnel were blocked due to a seismic event. Because the intake structure is safety grade, it is designed to withstand seismic events equal to or less than the magnitude of the safe shutdown earthquake.

4-7. Does the discharge contain any screens or any other features to prevent the intake of adult Corbicula? Describe these features, including the mesh size of any screens.

Response:

The discharge structure itself has no screens. There, however, are vertical traveling screens in the emergency service water pumphouse. These screens are described in Table 9.2-13, at page 9.2-62, of the PNPP FSAR.

4-8. During such circumstances in which the discharge would be used for water intake, do the Applicants intend to chlorinate the ESWS to kill any Corbicula larvae that might enter?

Response:

Applicants have no plans to use chlorination to control Corbicula.

4-9. Describe the provisions Applicants will employ to prevent the accumulation of sediment within the intake, discharge, and ESWS.

Response:

The intake and discharge tunnels are designed such that sedimentation presents no problem. The flow rate in the Emergency Service Water System is too fast for sedimentation to occur.

4-10. Will non-safety-related service water systems be subject to Corbicula monitoring and control? List every such system and give the degree to which it will be monitored.

Response:

The flow and pressure of the Fire Service System will be tested annually. While not conducted for the purpose of discovering Corbicula, these tests will indicate if Corbicula are blocking the System. Additional monitoring has been identified in Applicants' response to question ASB-9 of the NRC Staff. (See letter from Davidson to Schwencer dated April 29, 1982.) Applicants' response already has been sent to the service list.

4-11. Provide a detailed description of the lake bottom near PNPP, including that near the intake and discharge structures.

Response:

A detailed description of the lake bottom near PNPP is contained in a memorandum from Nugent to Zucker, dated September 22, 1982. A copy of the memorandum will be supplied for examination at PNPP.

4-12. Describe in detail all plans for chlorination of the ESWS and intake/discharge flows. Have chlorination cycles been designed to coincide with Corbicula spawning seasons in Lake Erie?

Response:

Chlorination is provided for both the Service Water and the Emergency Service Water Systems to control microorganisms in the water. No chlorination of the water is planned for Corbicula control.

4-13. Will the Corbicula monitoring program [including ESWS surveillance testing] for PNPP be continued throughout the construction of the plant and during maintenance outages after the plant begins operations?

Response:

Beginning this year, the Lake monitoring program for Corbicula will be continued indefinitely. Such monitoring will take place twice each year. Flow monitoring of the Emergency Service Water System will take place whenever the System is in operation. Visual monitoring of certain potential locations for Corbicula blockage will take place during maintenance outages or when the plant otherwise is not in operation. Commitments to monitor various points in the plants' water systems are detailed in Applicants' response to question ASB-9 of the NRC Staff. Applicants' response already has been sent to the service list.

4-14. Provide detailed, legible drawings of the ESWS; include the diameter of all piping, the location of flow meters and differential pressure indicators, and chlorination paths.

Response:

Drawings of the Emergency Service Water System will be made available for examination at PNPP.

4-15. Provide a detailed description (and drawings) of the RHR heat exchangers. Specifically discuss the similarities and differences of the Perry heat exchangers with those of the Brunswick plant and Pilgrim I.

Response:

A drawing of the RHR heat exchanges will be made available for examination at PNPP. The RHR has two loops, A and B, each of which has two heat exchangers connected in series. Each heat exchanger is a vertically mounted single-pass shell and double-pass U-tube type heat exchanger. RHR system flow is into the A or B heat exchanger shell through the penetration at the top and out through the shell penetration just above the ıbe sheet. The system flow then goes into the downstream C or D heat exchanger in the same manner. The shell of the upstream heat exchanger in each loop has nine one inch penetrations along its vertical axis which are connected to a common vent line. Two other penetrations are connected to a level transmitter. The tubes and tube sheet cladding are BWG Stainless Steel. The shell is carbon steel. Overall size of each heat exchanger is approximately 4 feet in diameter and 29 feet high. Total heat transfer rate is designed to satisfy the requirements of 1) shutdown cooling operation 20 hours after shutdown with the reactor 125°F and service water 10°F below maximum allowable temperature, 2) steam condensing operation one and one-half hours after shutdown with maximum service water temperature, or 3) containment cooling operation with maximum service water temperature. The maximum rate of heat transfer across both heat exchangers in either loop is limited to 150 x 10^6 BTU/Hr in the steam condensing mode. Both the tube and

shell sides are designed for operation over the temperature range from 40°F to 480°F and at pressures up to 500 psig.

Applicants do not have sufficient information about the Brunswick or Pilgrim I heat exchangers to compare Applicants' heat exchangers with those of Brunswick or Pilgrim I.

4-16. Are the RHR heat exchangers multiple pass? If so, does the potential for internal bypass leakage exist (see AEOD Report on Service Water System Flow Blockages by Bivalve Mollusks at Arkansas Nuclear One and Brunswick (February 1982) at p. 33)? Provide all plans Applicants have proposed for measuring heat exchanger performance, in terms of heat transfer coefficient (i.e., other than flow/pressure measurements).

Response:

The RHR heat exchangers are two-pass on the tube side and one-pass on the shell side. There is no possibility of bypass leakage between the tube and shell. The heat exchangers are hydrotested on both the shell and tube sides to ensure heat exchanger integrity. Heat exchanger performance will be evaluated periodically using flow, temperature and pressure measurements. Any significant deviations between the measured performance and design data will be corrected.

4-17. Will surveillance testing of the ESWS be conducted with the system aligned to its post-accident mode, as recommended by the AEOD Report?

Response:

One loop of the three loops in the Emergency Service Water System will be surveillance tested each month. The System will be aligned in a post-accident mode.

4-18. Are the RHR heat exchangers at such an elevation and the ESWS piping to same configured [sic] such that they would become a trap for any debris swept into them?

Response:

There is a "dead spot" directly below the location of the heat exchanger inlet and outlet. This area is drained, however, when the Emergency Service Water System is shut down. The area is then refilled with demineralized water.

4-19. Describe the metallurgical composition of the ESWS pumps, piping, and components, including that of any screens or cladding. Specifically, is Cu-Ni (or any other substance that might be toxic to clams) used?

Response:

The Emergency Service Water System is composed of various grades of carbon steel and stainless steel, leaded red brass and aluminum bronze. No Cu-Ni is used in the System. Because Applicants do not know which substances conceivably could be toxic to Corbicula, Applicants cannot identify "any other substances that might to toxic to clams."

4-20. Describe the metallurgy of RHR heat exchanger baffle plates and water boxes (and any welds therein). I.e., is carbon steel or Cu-Ni used? Compare the strength of the PNPP RHR heat exchangers with those at Brunswick/Pilgrim I.

Response:

The RHR heat exchangers are composed of various grades of carbon steel and stainless steel, and copper. No Cu-Ni is used in the heat exchangers. Applicants do not have sufficient information about the Brunswick or Pilgrim I heat exchangers to

compare Applicants' heat exchangers with those of Brunswick or Pilgrim I.

Respectfully submitted,

SHAW, PITTMAN, POTTS & TROWBRIDGE

By: _____

Jay E. Silberg, P.C.
Robert L. Willmore

Counsel for Applicants
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(202) 822-1000

Dated: September 28, 1982

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

CLEVELAND, OHIO

Richard A. Pender , being duly sworn according to law, deposes that he is Lead Mechanical Engineer Nuclear Analysis and Design Section of The Cleveland Electric Illuminating Company and that the facts set forth in the foregoing Applicants' Answers to Ohio Citizens for Responsible Energy Interrogatories 4-14 through 4-20 dated September 7, 1982 , are true and correct to the best of his knowledge, information and belief.

Richard A. Pender

Sworn to and subscribed
before me this 28 day
of September, 1982

Caroline M. Wilde

CAROLINE M. WILDE
Notary Public, State of Ohio
My Commission Expires April 17, 1985
(Recorded in Lake County)

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

CLEVELAND, OHIO

Raymond F. Zucker, Jr. , being duly sworn according to law, deposes that he is Chemical Engineer , Nuclear Design and Analysis Section of The Cleveland Electric Illuminating Company and that the facts set forth in the foregoing Applicants' Answers to Ohio Citizens for Responsible Energy Interrogatories 4-1 through 4-13 dated September 7, 1982 , are true and correct to the best of his knowledge, information and belief.

Ray F. Zucker Jr.

Sworn to and subscribed
before me this 28 day
of September, 1982

Caroline M. Wilde

CAROLINE M. WILDE
Notary Public, State of Ohio
My Commission Expires April 17, 1985
(Recorded in Lake County)

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Units 1 and 2)	)	

CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing "Applicants' Answer to Ohio Citizens For Responsible Energy Fourth Set of Interrogatories to Applicants," were served by deposit in the U.S. Mail, First Class, postage prepaid, this 28th day of September, 1982, to all those on the attached Service List.

Robert L. Willmore

Dated: September 28, 1982

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