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COUNSEL

December 10, 1982

WRITER'S DIRECT DIAL NUMBER

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Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: The Cleveland Electric Illuminating Company (Perry Nuclear Power Plant, Units 1 and 2) Docket Nos. 50-440 and 50-441

Gentlemen:

I am forwarding to you with this letter the original of Applicants' "Affidavit of Richard A. Pender and Ronald L. Scherman in Support of NRC Staff's Motion for Summary Disposition of Issue No. 7" which was included with Applicants' Answer in Support of NRC Staff Motion for Summary Disposition of Issue No. 7, dated December 7, 1982.

Sincerely,

JAY E. SILBERG
Counsel for Applicants

JES:lam
Enclosure
cc: Service List

D503

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

AFFIDAVIT OF RICHARD A. PENDER
AND RONALD L. SCHERMAN
IN SUPPORT OF NRC STAFF'S
MOTION FOR SUMMARY DISPOSITION OF ISSUE NO. 7

State of Ohio)
: ss:
County of Lake)

Richard A. Pender and Ronald L. Scherman, being duly sworn, depose and say as follows:

1. I, Richard A. Pender, am Senior Engineer, Nuclear Design & Analysis Section, Licensing Support Group, Cleveland Electric Illuminating Company ("CEI"). My business address is 10 Center Road, Perry, Ohio, 44081. A summary of my professional qualifications and experience is attached hereto as Exhibit "A." I have personal knowledge of the matters set forth herein and believe them to be true and correct.

2. I, Ronald L. Scherman, am Maintenance Supervisor, CEI. My business address is 10 Center Road, Perry, Ohio, 44081. A summary of my professional qualifications and experience is attached hereto as "Exhibit B." I have personal

knowledge of the matters set forth herein and believe them to be true and correct.

3. We have reviewed the NRC Staff's Motion for Summary Disposition of Issue No. 7, dated November 12, 1982, and supporting documents, including the Affidavit of C. R. Hickey, Jr. and N. E. Fioravante in Support of Summary Disposition of Issue 7. We agree with the statements contained therein and give this Affidavit in support of the Staff's motion.

Introduction

4. In response to the Staff's Auxiliary System Branch Question No. 9 ("ASB-9"), CEI has committed to a plant monitoring program in order to detect the presence of Asiatic clams at Perry Nuclear Power Plant ("PNPP"). Detection will occur early enough that any control measures necessary to prevent harmful flow blockage in the Emergency Service Water System ("ESWS") from Asiatic clams can be developed. The monitoring program will consist of surveillance testing of the ESWS as well as maintenance inspection of the ESWS and other systems directly utilizing raw water from Lake Erie.

5. In the event that Asiatic clams are detected either at PNPP or CEI's fossil fueled Eastlake plant, CEI will develop a program to control the clams within PNPP's ESWS. A preliminary control program using thermal shock has already been developed.

6. The ESWS is the only safety-related cooling system which could become infested with Asiatic clams because it is the only safety-related cooling system which draws water directly from Lake Erie. All other safety-related cooling systems use demineralized water. The process that generates demineralized water utilizes a cation exchanger which produces water at a very low PH and would kill any clams present in the water.

Surveillance Testing

7. As part of its plant monitoring program, CEI has committed to perform regular surveillance tests on the ESWS. The ESWS consists of three independent cooling loops. CEI intends to test, at a minimum, one loop once a month. Because the three loops have a common water source, if clams are not found in the loop being tested, they would not be likely to be present in the other loops.

8. The surveillance test will consist of flow and pressure measurements throughout the loop. During start-up testing, flow through each branch line will be monitored and set at the design flow. This will be accomplished by throttling a manual valve in each branch line until the desired flow is measured. Once the entire loop is flow balanced, pressure and flow measurements will be recorded and a data base established.

9. The data will consist of:

a. ESW pump discharge pressure;

b. inlet and outlet pressure of the following equipment:

Residual Heat Removal heat exchanger, Emergency Closed Cooling heat exchanger, D/G Jacket Water heat exchanger, and High Pressure Core Spray heat exchanger;

c. heat exchanger flow.

10. Every month, the recorded pressure/flow data will be forwarded to CEI's Nuclear Design and Analysis Section ("ND & AS") for evaluation. Since the tested cooling loop will be flow balanced, any increase in system resistance resulting from significant aquatic life growth will result in measurable flow reduction. An experienced Design Engineer will analyze the data and will be able to tell if overall system efficiency is deteriorating. The measurements of pressure/flow data will detect the presence of any growth of Corbicula in the ESWS long before enough Corbicula would be present to form a flow blockage of the type which caused the damaged heat exchanger baffle plate at Carolina Power & Light's Brunswick station. ND & AS will evaluate the deterioration and direct operating personnel to take appropriate action to insure that overall system effectiveness is not diminished.

Maintenance Inspection

11. In addition to surveillance testing of the ESWS, CEI will incorporate into its Perry maintenance and inspection program a program for Corbicula monitoring. CEI will monitor for Corbicula the ESWS as well as other, non-safety, non-essential systems like the Service Water System and Circulating Water System which use raw water from Lake Erie. Inspection of these systems will help insure that Asiatic clams will be promptly detected should they somehow infest PNPP.

12. As stated in response to ASB-9, CEI will on a routine basis inspect for Corbicula those potential collection points within PNPP's raw water systems which can be visually inspected. Within the ESWS, for example, such potential collection points include the pumphouse traveling screens and trash racks. Corbicula also would be expected to collect in the cooling tower basins, which are part of the Circulating Water System. The cooling tower basins will be routinely inspected during scheduled outages. (There are no interconnections between the cooling tower basins - or other parts of the Circulating Water System - and the ESWS.) For areas where Asiatic clams may become apparent during normal operations, such as the screen wash catch basin, personnel will be instructed to inspect the catch basin trash basket for evidence of Corbicula.

13. Raw water system equipment that has been taken out of service for repairs will also be inspected for Corbicula in accordance with CEI's routine maintenance procedures. All

maintenance work at PNPP will be performed by use of a Work Order. Among the instructions which will be a part of the Work Order when a component of a raw water system is opened for maintenance will be a copy of "Inspection of Raw Water Systems/Components for Corbicula G.M.I. 0023."

14. This instruction requires that any raw water system component upon which maintenance is performed be carefully examined for clams, clam shells, or shell debris. The instruction further requires that any such material found will be collected and brought to the Maintenance Supervisor and that the Maintenance Supervisor will then contact the Chemical and Environmental Unit of ND & AS, which will obtain positive identification of the material.

15. Inspection of potential collection points and components of raw water systems will be conducted as frequently as possible based on normal maintenance activities and outages.

16. CEI's maintenance inspection procedures together with its surveillance testing program will insure that any Corbicula which invade PNPP will be promptly detected before flow blockage which might impair the effectiveness of the ESWS can occur.

17. In addition to the Perry maintenance program, CEI will also establish procedures at its Avon Lake, Eastlake and Lakeshore fossil-fired generating stations (all of which are located on Lake Erie to the west of PNPP) for the notification of PNPP operating personnel if clams or clam shell debris are found in those plants during routine maintenance.

Corbicula Control

18. In the response to ASB-9, CEI agreed to develop a program to control the growth of Asiatic clams within the ESWS if Asiatic clams were found at either CEI's Eastlake Plant or PNPP. Even though Asiatic clams have not been found at either of these two plants, a preliminary control program using thermal shock has been developed to demonstrate that clams can be easily controlled if they were to invade PNPP.

19. The program of thermal shock described herein utilizes proven, existing technology to control Corbicula infestation and growth. However, there are several methods currently used to control the growth of Corbicula in power plants; and CEI intends to stay abreast of Corbicula control technology in order to prepare for the unlikely event of Corbicula infestation. CEI is not at this time committing to the thermal shock method because future research may suggest advantageous adjustments to the program or an entirely new method of accomplishing the desired control.

20. In the event that Corbicula infest the ESWS, they can be killed by thermal shock. This will be accomplished by immersing the clams in hot water for a sufficient time to cause mortality. Studies have shown that no Corbicula can survive if exposed to water at 43°C (109.4°F) for 30 minutes. See Affidavit of Dr. Richard S. Nugent in Support of NRC Staff's Motion for Summary Disposition of Issue No. 7.

21. Hot water will be generated in a U-tube heat exchanger. A pump will take suction from the ESW pump house forebay and pump cold water to the heat exchanger. After passing through the heat exchanger the water will be heated to approximately 150°F. Steam supplied by the plant's auxiliary boilers will be used to heat the cold water. The hot water will then be pumped into each of the three ESW loops by tapping into the respective ESW pump discharge line, upstream of the strainer. The pump will be sized to fill one loop in the system in less than an hour. See Table #1. The pump will continue pumping after the system is filled to maintain water temperature above 43°C (109.4°F) for the required 30 minute holding period. To assure that the water remains hot enough to kill the Corbicula, temperature will be monitored at the discharge of the ESW pumps, Residual Heat Removal heat exchangers, Emergency Closed Cooling heat exchangers, the Diesel Generator heat exchangers, and the High Pressure Core Spray Room Cooler. Once the required temperature has been maintained for the required amount of time, the pump for the hot water will be shut down.

22. The next step will be to drain the system so the dead clams can be cleaned out. The system can be drained by using existing drain valves throughout the system. These drain valves will be opened and the water screened to remove the dead clams before the water is routed to the nearest floor drain. (If any of the drained water were returned to the lake, the

additional temperature increase to the thermal plume would be insignificant.) After the system is drained, the access covers located on the heat exchangers will be removed. This will give access to an area (between the access cover and tube sheet) where the highest clam build-up is expected. The dead clams found in this area will be shoveled out by hand and disposed of. Piping connected to the heat exchangers will also be inspected at this time, before access covers are re-installed. If clams are found in the piping, the system will be flushed using the ESW pumps. The draining/flushing procedure will be repeated until the clam debris is removed from the system.

23. This procedure depends for its implementation only on the availability of water in Lake Erie and steam from the plant auxiliary boilers. There are two auxiliary boilers. These boilers, if not already in operation, could quickly be activated. The program will be implemented in only one of the three ESWS loops at any one time. The new equipment required is very basic in nature; the process calculations are simple; and the installations are straightforward. Thus, this thermal shock system offers a feasible, easily implemented, and easily evaluated method of accomplishing 100 per cent mortality in the clam population without affecting any other operating plant systems.

24. A conceptual design has been completed for this hot water system. A preliminary cost estimate for this design is approximately $250,000. See Table #2. Installation of this system has been conservatively estimated to take about two weeks.

Richard A. Pender

Subscribed and sworn to before me
this 3rd day of December, 1982.

Joanne Kibiniskas
NOTARY PUBLIC

My Commission Expires:
JOANNE KIBINISKAS, Notary Public
State of Ohio - Lake County
My comm. exp. Nov. 12, 1983

Ronald L. Scherman

Subscribed and sworn to before me
this 3rd day of December, 1982.

Joanne Kibiniskas
NOTARY PUBLIC

My Commission Expires:
JOANNE KIBINISKAS, Notary Public
State of Ohio - Lake County
My comm. exp. Nov. 12, 1983

TABLE #1

	"A" LOOP	"B" LOOP	"C" LOOP
GALLONS OF WATER TO FILL	33,390	47,730	5,958
TIME TO FILL	41.8 MIN @ 800 GPM	59.7 MIN @ 800 GPM	59.6 MIN @ 100 GPM

TABLE #2

COST ESTIMATE
FOR HOT WATER SYSTEM

Vertical U-Tube Heat Exchanger	$ 38,000
2000 GPM Pump	10,000
200 HP Motor	7,000
Valves	44,000
Material (Pipe & Fittings)	68,000
Excavation (Dig Trench to Pump House)	15,000
Installation (Labor)	86,000
	$ 268,000

Exhibit A

RICHARD A. PENDER

Education:

Ohio State University - B.S. Mechanical Engineering - December, 1969.
Cleveland State University - M.S. Mechanical Engineering - June, 1981
Registered Professional Engineer in the State of Ohio
Member ASME.

Professional Experience:

Employed, Cleveland Electric Illuminating Company since graduation from OSU.

October, 1982 to Present

Senior Engineer - Nuclear Design & Analysis Section Nuclear Engineering Department. Presently supervising engineering section which is responsible for technical support of Perry Nuclear Power Plant licensing activities. Supervised development of preliminary Corbicula control program using thermal shock. Responsible for insuring that licensing commitment to NRC Staff with respect to Corbicula control is being met.

January, 1979 to October, 1982:

Engineer - Nuclear Design Section, Nuclear Engineering Department. Supervising engineering section responsible for the design of 2-1250 MW Nuclear Generating Plants, Perry 1 and 2, with a capital expenditure exceeding 2 billion dollars. Section responsibilities included: design, start-up support, construction support and equipment procurement. Supervised design of ESWS and developed program for surveillance testing of ESWS for Corbicula. Promoted to Senior Engineer in October, 1982.

October, 1975 to January, 1979:

Associate Engineer/Engineer - Nuclear Design Secti Nuclear Engineering Department. Responsible for Turbine Cycle - Balance of Plant design for Perry Units. Included specification writing, knowledge of codes and equipment procurement. Promoted to Engineer in October, 1976.

April, 1974 to October, 1975:

Associate Engineer - Mechanical Design Section, Civil and Mechanical Engineering Department. Responsible for Piping design. Supervised drafting personnel.

January, 1970
to April, 1974

Junior Engineer/Associate Engineer - Production Engineering Unit, Civil and Mechanical Engineering Department. Responsible for the testing of mechanical equipment. Included lead test engineer of ASME Turbine Acceptance Test of 650 MW, Super-critical Unit. Supervised Technicians. Promoted to Associate Engineer in July, 1972.

Exhibit B

RONALD L. SCHERMAN

Education:	Aviation Electrician Mate's School, U.S. Navy, 1968. Twenty-Week Academic Program for Nuclear Power Plant Personnel (General Physics Corporation) 1975-1976. Attended Kent State University, Courses in Mechanical Engineering Technology, 1976-1977. Five-Week Modern Management, Maintenance Planning (CEI), 1979.
Professional Experience:	The Cleveland Electric Illuminating Company
1980-Present	Maintenance Supervisor at Perry Plant. Duties include: developing the maintenance program; developing preventive and corrective maintenance procedures and instructions; and hiring and supervising craft personnel. Responsible for developing "Inspection of Raw Water Systems/Compone for Corbicula G.M.I. 0023."
1979-1980	Maintenance Planner at Ashtabula Plant (fossil-fired plant). Activities included establishing maintenance standards for repairs of plant equipment. Also served on rotation of assignment as Electrical Maintenance Supervisor at Ashtabula Plant.
1977-1979	Grade I Electrician at Lakeshore Plant (fossil-fired plant).
1974-1977	Electrical Apprentice at Lakeshore Plant. Primaril worked on the maintenance and operation of fossil plant electrical systems.
1972-1974	Plant Helper - assigned to Eastlake Plant (fossil-fired plant).
1968-1971	U.S. Navy Aviation Electrician Mate - Duties included the performance of preventive and corrective maintenan on military aircraft.

December 7, 1982

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY, et al.	)	Docket Nos. 50-400 50-401
	)	
(Perry Nuclear Power Plant, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing "Applicants' Answer in Support of NRC Staff Motion for Summary Disposition of Issue No. 7", "Affidavit of Richard A. Pender and Ronald L. Scherman in Support of NRC Staff's Motion for Summary Disposition of Issue No. 7", and "Affidavit of Dr. Richard S. Nugent in Support of NRC Staff's Motion for Summary Disposition of Issue No. 7" were served by deposit in the United States Mail, First Class, postage prepaid, this 7th day of December, 1982, to all those on the attached Service List.

Jay E. Silberg

Jay E. Silberg

Dated: December 7, 1982

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
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