UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| CLEVELAND ELECTRIC ILLUMINATING COMPANY, ET AL. | ) | Docket No. 50-440 OL<br>50-441 OL |
| | ) | |
| (Perry Nuclear Power Plant, Units 1 and 2) | ) | |

AFFIDAVIT OF NICHOLAS E. FIORAVANTE IN SUPPORT OF SUMMARY DISPOSITION OF ISSUE NO. 5

I, Nicholas E. Fioravante, state under oath that:

1. I am a Mechanical Engineer in the Auxiliary Systems Branch, Division of Systems Integration, Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission. I have knowledge of the matters set forth herein and believe them to be true and correct. A statement of my professional qualifications is attached.

2. Issue No. 5 states that:

> Applicant has not demonstrated the safety of its reactor from an unrecoverable loss of coolant accident which could occur from a pipe break in the scram discharge volume. See NUREG-0785 ["Safety Concerns Associated with Pipe Breaks in the BWR Scram System"]

3. NUREG-0785 on page vi states that a "failure to isolate a SDV system pipe break raises serious concerns regarding the assurance of long-term decay heat removal with emergency core cooling systems since the break itself potentially threatens operation of this equipment."

4. As described in NUREG-0785 the postulated pipe break in the scram discharge volume if not isolated would be the equivalent of a small unisolated break in the bottom of the reactor vessel. The coolant inventory flowing from that break would be lost from the primary containment and thus would not accumulate in the drywell-torus that is the normal reservoir for water for long-term cooling. Moreover, in that NUREG-0785 scenario the lost coolant could possibily be directed to areas of the reactor building housing the emergency core cooling equipment.
5. The scenario described in NUREG-0785 is not applicable to the BWR6/Mark III containment design and thus an SDV pipe break in nuclear plants of that type poses no threat to the long-term cooling capability provided by the ECCS. See NUREG-0803, "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping," at p. 2-3.
6. In the BWR6/Mark III design, the scram discharge volume piping is located within the primary containment. Any primary coolant inventory released from a scram discharge volume pipe break would remain in containment and be returned directly to the suppression pool. Any of the released primary coolant inventory that flashes to steam would be condensed inside containment and also returned to the suppression pool. This primary coolant inventory will not be lost from the primary containment and thus can be re-used for makeup to the vessel. Using the suppression pool as a water source, the ECCS has the capability of providing makeup water to the vessel until the break can be isolated.

7. Immediate isolation of the break in the scram discharge volume piping is not necessary because the ECCS, the residual heat removal (RHR) system and the reactor core isolation cooling (RCIC) system can prevent the core from being uncovered and can remove the decay heat from the core for an extended period of time. Moreover, if the scram discharge volume pipe break cannot be isolated remotely by closing the scram outlet valves from the control room, manual isolation of the break can be accomplished when the dose rate decays sufficiently to allow entry into containment.

8. The ECCS, RHR and RCIC are located in individual watertight compartments outside of the primary containment in the auxiliary building. The ECCS, RCIC and RHR would not be subjected to flooding or any adverse environmental conditions resulting from a postulated pipe break in the scram discharge volume piping. The ECCS, RCIC and RHR have the capability of being automatically or manually actuated to mitigate the consequences of a pipe break in scram discharge volume piping.

9. Therefore, a SDV pipe break in the Perry plant will not cause an unrecoverable loss-of-coolant accident that threatens the safety of the reactor.

Nicholas E. Fioravante

Nicholas E. Fioravante

Subscribed and sworn to before me
this 5th day of November, 1982

Lois E. Sneets

Notary Public

My Commission Expires: 7-1-1986

NICHOLAS E. FIORAVANTE
PROFESSIONAL QUALIFICATIONS

AUXILIARY SYSTEMS BRANCH
DIVISION OF SYSTEMS INTEGRATION
OFFICE OF NUCLEAR REACTOR REGULATION

I am a Mechanical Engineer in the Auxiliary Systems Branch in the Division of Systems Integration, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission. In this position, I perform technical reviews and evaluations of the functional capability of auxiliary systems and components pursuant to the construction and operation of reactors.

I received a Bachelor of Science Degree in Mechanical Engineering from George Washington University in 1977. Since 1977, I have taken courses on PWR and BWR technology, System Reliability Engineering and Risk Assessment, Effects of Human Performance on Nuclear Power Plant Operations, Accident Phenomenology and Containment Response and Bayesian Reliability Analysis. I'm presently enrolled in Master of Science in Management degree program with Frostburg State College.

My experience includes three years with the David W. Taylor Naval Ship R&D Center as a Structural Engineer engaged in various design phases of naval ship protection systems.

I joined the Auxiliary Systems Branch in May, 1980. Since that time, I have prepared safety evaluation inputs for the Perry Nuclear Power Plant, the Clinton Power Station, the Shoreham safety shutdown review, the Indian Point Stations' fuel pool expansion program, the Big Rock Point loss of service water review and the auxiliary feedwater reliability reviews of D.C. Cook, Beaver Valley 1, and San Onofre 1. I prepared revisions of Standard Review Plan sections 9.3.1, 9.3.3, 9.3.5 and 3.6.1. Additionally, my assignments include technical monitor and project manager responsibility for the "Post-Fire Shutdown Capability" program.

I have responsibility for the review of the following nuclear power plant auxiliary systems: new and spent fuel storage; spent fuel cooling system; spent fuel handling; service water system; reactor auxiliary cooling water system; demineralized water makeup system; ultimate heat sink; condensate storage facilities; compressed air system; standby liquid control system; HVAC system for control room area, spent fuel pool area, auxiliary and radwaste area, and ECCS areas; main steam supply system and circulating water system.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of<br><br>CLEVELAND ELECTRIC ILLUMINATING COMPANY, ET AL.<br><br>(Perry Nuclear Power Plant, Units 1 and 2) | )<br>)<br>)<br>)<br>)<br>)<br>) | Docket No. 50-440 OL<br>50-441 OL |

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S MOTION FOR SUMMARY DISPOSITION OF ISSUE NO. 5" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk, by deposit in the Nuclear Regulatory Commission's internal mail system, this 9th day of November, 1982:

*Peter B. Bloch, Esq., Chairman
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

*Dr. Jerry R. Kline
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

*Mr. Frederick J. Shon
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Jay Silberg, Esq.
Shaw, Pittman, Potts and Trowbridge
1800 M Street, NW
Washington, DC 20036

Donald T. Ezzone, Esq.
Assistant Prosecuting Attorney
105 Main Street
Lake County Administration Center
Painesville, Ohio 44077

Susan Hiatt
8275 Munson Road
Mentor, Ohio 44060

Daniel D. Wilt, Esq.
P. O. Box 08159
Cleveland, Ohio 44108

Terry Lodge, Esq.
Attorney for Intervenors
915 Spitzer Building
Toledo, Ohio 43604

John G. Cardinal, Esq.
Prosecuting Attorney
Ashtabula County Courthouse
Jefferson, Ohio 44047

*Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

*Atomic Safety and Licensing
Appeal Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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

James M. Cutchin IV
Counsel for NRC Staff