UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
HOUSTON LIGHTING & POWER COMPANY	)	Docket No. 50-466
	)	
(Allens Creek Nuclear Generating Station, Unit No. 1)	)	

AFFIDAVIT OF WALTER F. MALEC

State of New Jersey
County of Bergen

I, Walter F. Malec, Supervising Mechanical Nuclear Engineer, Allens Creek Project, for Ebasco Services Incorporated, of lawful age, being first duly sworn, upon my oath certify that I have reviewed and am thoroughly familiar with the statements contained in the attached affidavit addressing Doherty Contention 13 regarding Emergency Core Cooling System Sumps and that all statements contained therein are true and correct to the best of my knowledge and belief.

Walter F Malec

Subscribed and sworn to before me this 21st day of July, 1980.

Carol A. Opitenok

CAROL A. OPITENOK
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES SEPT. 18, 1983

8008190088

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	§	
	§	
HOUSTON LIGHTING & POWER COMPANY	§ §	Docket No. 50-466
	§	
(Allens Creek Nuclear Generating Station, Unit No. 1)	§ § §	

AFFIDAVIT ADDRESSING JOHN F. DOHERTY'S CONTENTION NO. 13 ON EMERGENCY CORE COOLING SYSTEM SUMPS

My name is Walter F. Malec. My business address is 160 Chubb Avenue, Lyndhurst, N. J. I am the Supervising Mechanical Nuclear Engineer for the Allens Creek Project employed by Ebasco Services Incorporated. The statement of my background and qualifications is attached as Exhibit I to this testimony.

This affidavit responds to Doherty's Contention No. 13 which alleges that the ACNGS Emergency Core Cooling System (ECCS) performance will be degraded by blockage of the ECCS pump suction line strainers with insulation dislodged during a loss-of-coolant accident (LOCA).

During a postulated loss-of-coolant accident, the ECCS pumps draw suction from both the Suppression Pool and the

Condensate Storage Tank and deliver it to the Reactor Pressure Vessel. After the Reactor Pressure Vessel is filled to the level of the break causing a LOCA, ECCS water will flow through the break and fill the drywell to the top of the weir wall. (See PSAR Figures 1.2-8 attached.) ECCS water will then flow between the weir wall and the drywell wall and out through the 120 drywell vent openings into the Suppression Pool, thereby establishing a recirculating flow path for ECCS cooling.

Each of the five (5) ECCS pump suction lines will be provided with a strainer assembly. The size and configuration of the strainer openings guarantee that the maximum particulate size which will pass through the strainer will also pass through the smallest restrictions in the pumps, piping, containment spray nozzles, and core channels which comprise the ECCS flow path. This maximum allowable particulate size is limited by the ECCS pump cyclone separator to 1/16th to 1/8th inch in diameter. Hence, the suction strainers will be sized to stop larger sized particles which could hamper system performance by becoming lodged in pumps or other small openings.

The strainer assemblies are part of Safety Class 2 systems and will be designed to ASME Class 2 requirements in accordance with ASME Boiler and Pressure Vessel Code Section III. These assemblies are designed with three times the open area of the suction piping to provide a high confidence that strainer clogging will not restrict ECCS cooling. With this extra large strainer area, the assembly design, when considered in conjunction with the design of drywell insulation, contributes to the assurance that unacceptable strainer blockage will not occur and net positive suction head requirements will be satisfied. (See PSAR Section 6.3.2.14.) This satisfies the requirements of Regulatory Guide 1.1, "Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal System Pumps."

The insulation type utilized in the drywell and containment also contributes to the assurance that ECCS flow will not be impeded. Insulation in the Drywell is of the metallic reflective type. All surfaces and interior layers of the metallic reflective type of insulation are austenitic stainless steel; the total thickness will be approximately 3 to 4 inches and will conform to the shape of the equipment it envelopes. This type of insulation is the least likely of available insulation types to result in blockage of the ECCS strainers.

Even if displaced during a postulated LOCA, the insulation may be crushed by the hydraulic and mechanical forces produced. The insulation would then either sink to the bottom of either the Drywell or Suppression Pool and remain on the floor or float in the water if enough air is entrapped. In addition, since the strainers have three times the open area of ECCS pump suction piping and the Suppression Pool has a very large, flat area of approach to the strainer intake, a very low velocity profile exists in the vicinity of the strainers. Both of these factors significantly reduce the possibility of debris being drawn into the strainer.

The ECCS pump suction strainers are located at an elevation of 6 feet above the Suppression Pool floor and are always submerged to avoid flow degradation by vortices and to maintain adequate NPSH for the ECCS pumps. The pump suctions are elevated above the Suppression Pool floor to avoid ingestion of sunken debris, but as noted above, are also below the Suppression Pool surface to avoid ingestion of floating debris.

A small amount of other types of insulation may be used in the containment but outside the drywell. However, because the areas in which this insulation might be used are isolated from the Suppression Pool in separate compartments, with shield doors and/or screen doors, the path from these compartments to the Suppression Pool is extremely tortuous. It is extremely unlikely that dislodged insulation material could successfully negotiate the required path through the intervening equipment, structures and piping and find its way to the Suppression Pool.

Moreover, with regard to paintings and coatings inside the containment, Applicant has addressed Regulatory Guide 1.54, "Quality Assurance Requirements for Protective

Coatings Applied to Water Cooled Nuclear Power Plants," as described in PSAR, Appendix C. This will minimize or eliminate the potential for clogging from paint chips or pieces produced by hydraulic, mechanical or thermal forces during a postulated LOCA.

In conclusion, the ACNGS ECCS suction strainers are designed with a significant overcapacity, conservative redundancy, and optimum orientation to prevent flow restriction due to debris clogging. The design placement of insulation and the painting of the containment interior are also carefully controlled to minimize the generation of debris during the loss-of-coolant accident. These features provide a high degree of assurance that ECCS cooling will not be degraded in the fashion alleged by Intervenor.

Born — Philadelphia, Pennsylvania

Education — Polytechnic Institute of Technology, degree of Engineer in Nuclear Engineering - 1978
Massachusetts Institute of Technology, MS in Nuclear Engineering - 1970
U.S. Coast Guard Academy, BS - 1968

Member — American Nuclear Society

Licensed — Registered Professional Engineer in the State of New York (No. 56673)

Experience:

1980 — Ebasco Services Incorporated, Lyndhurst (NJ) Office; Supervising Engineer, Mechanical-Nuclear Engineering Department:

Houston Lighting & Power Co - Allens Creek NGS - Unit No. 1 - 1200 MW(e) BWR

Technical and administrative responsibility for mechanical, fire protection, plumbing, HVAC, stress analysis, hangers and supports, and inservice inspection activities. Includes schedules, budgets, and client relations.

1978-1980 — Ebasco Services Incorporated, Lyndhurst (NJ) Office; Principal Engineer, Mechanical-Nuclear Engineering Department

Houston Lighting & Power Co - Allens Creek NGS - Unit No. 1 - 1200 MW(e) BWR, Lead NSSS Engineer

Responsible for preparation and maintenance of ECCS and BOP flow diagrams, piping layouts, system design descriptions, inservice inspection provisions, Nuclear Island building general arrangements, PSAR and FSAR preparation, equipment sizing and specification, NSSS vendor interface for correspondence, drawing review, and contract administration.

1976-1978 — Ebasco Services Incorporated, New York Office; Senior Engineer, Mechanical-Nuclear Engineering Department including:

Houston Lighting & Power Co - Allens Creek NGS - Unit No. 1 - 1200 MW(e) BWR, Lead NSSS Engineer

Louisiana Power & Light Co - Waterford SES Unit No. 3 - 1165 MW(e) PWR. Lead NSSS Engineer

(Same responsibilities as listed for 1978-1980 above.)

1976-1978 (Cont'd)	Responsible for preparation and maintenance of ECCS and BOP flow diagrams, piping layouts, system design descriptions, inservice inspection provisions, Nuclear Island building general arrangements, PSAR and FSAR preparation, equipment sizing and specification, NSSS vendor interface for correspondence, drawing review, and contract administration.

* * * * *

1974-1976	United States Coast Guard, Marine Inspection Office, New York; Lieutenant - Supervisory Boiler Inspector. Responsibility for supervision, assignment and training of Marine Inspectors in largest Marine Inspection Office in country. Inspection of hull and machinery material condition of U.S. flag and foreign merchant vessels, and pressure vessels under construction. Application of various laws and regulations of the United States, ASME Code, ANSI, TEMA, NEC and NFPA Standards. Review of engineering plans and alterations, reports from field and resident inspectors.
1973-1974	United States Coast Guard, USCGC Spencer (WHEC-36), Lieutenant - Chief Engineer. Responsibility for operation, maintenance and repair of hull and engineering plant of 6200 slip twinscrew steamship. Direct supervision of 40 officers and men. Duties included preparation of repair specifications and maintenance of vessel records. Received Coast Guard Achievement Medal for superior performance of duty.
1970-1973	United States Coast Guard, Marine Inspection Office, New York, Lt and Ltjg - Marine Inspector. Inspection of hull and machinery of U.S. and foreign flag merchant vessels.
1968-1969	United States Coast Guard, USCGC Mellon (WHEC-717), Ensign, Assistant Engineer Officer.