

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF RAYMOND A SULLIVAN AND ROBERT C CHENG

State of New Jersey  
County of Bergen

We, Raymond A Sullivan and Robert C Cheng, Principal Civil Engineers for Ebasco Services Inc. on the Allens Creek Project, of lawful age, being first duly sworn, upon our oath certify that we have reviewed and are thoroughly familiar with the statements contained in the attached affidavit addressing intervenor John F. Doherty's Contention 5 regarding suppression pool swell. All statements contained therein which relate to Ebasco Services Incorporated responsibility for the design of HCU and TIP platforms for the Allens Creek Nuclear Generating Station, are true and correct to the best of our knowledge and belief.

Raymond A. Sullivan

Robert Cheng-wan Cheng

Subscribed and sworn to before me this 10<sup>th</sup> day of July, 1980.

Carol A. Opitenok

CAROL A. OPITENOK  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES SEPT. 18, 1981

8008190061

52

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 RAYMOND A. SULLIVAN  
AND ROBERT C. CHENG

My name is Raymond A. Sullivan. My business address is 160 Chubb Avenue, Lyndhurst, N.J. I am the Principal Civil Engineer responsible for Reactor Containment Building Design employed by Ebasco Services Incorporated. The statement of my background and qualifications is attached as Exhibit I to this testimony.

My name is Robert C. Cheng. My business address is 160 Chubb Avenue, Lyndhurst, N.J. I am the Principal Civil Engineer responsible for Reactor Containment Building NSSS Interface employed by Ebasco Services Incorporated. The statement of my background and qualifications is attached as Exhibit II to this testimony.

The purpose of this affidavit is to address John Doherty's Contention No. 5 which alleges that the control rod

drive mechanism hydraulic control units (HCUs) and the transversing incore probe (TIP) may be damaged by the hydrodynamic forces of a high vertical water swell in the Suppression Pool following a loss of coolant accident (LOCA). This affidavit addresses those portions of the contention which relate to matters within Ebasco Services Incorporated's design responsibility for the Allens Creek Nuclear Generating Station.

As the affidavit of Peter P. Stancavage explains in considerable detail, General Electric Company has performed extensive tests to obtain information on the hydrodynamic loads that are generated in the area of the Mark III Suppression Pool during a LOCA.

#### HCU Platform

The steel platform supporting the HCU Modules will be located above the height at which the General Electric Test Program indicates the largest LOCA induced bulk pool swell loads have terminated. The HCUs will sit on a checkered steel plate floor 22 feet and 5 inches above the normal suppression pool surface. This floor will be approximately half an inch thick and supported by floor beams spanning between wide-flanged girders approximately 27 inches deep. These girders will be supported from the drywell wall with no connection to the steel Containment Vessel. With this arrangement, the bottom of the floor girders will be approximately 20 feet above

the surface of the suppression pool where they will be impacted only by the froth impingement portion of the LOCA loads determined by General Electric.

Top mounted trusses will be connected to the top of the girders in this region to resist the load from the froth impingement effect during LOCA. These trusses will also serve as supporting structures for the HCU modules against lateral seismic effect.

Vibratory response of the support platform will subsequently transmit a response load to the HCU modules. The magnitude of this response load for Allens Creek will be computed by Ebasco in a plant unique dynamic analysis. This response load will subsequently be utilized by General Electric in its dynamic qualification of the HCU modules.

#### Tip Platform

The Tip Station will be located on a concrete platform cantilevering about 7 feet out from the drywell wall at an elevation of about 6 feet above the normal suppression pool surface. To reduce the pool swell loads on this structure the cantilever will be arranged thick enough so that the bottom surface is immersed into the pool; this bottom surface will also be sloped to function as a deflector. Therefore, with this arrangement the platform will experience only the LOCA bubble pressure plus drag forces, and not the bulk swell impact.

EXHIBIT I

RESUME - R A SULLIVAN  
Principal Civil Engineer

SUMMARY OF EXPERIENCE

Total Experience - 15 years in civil engineering, all in design, specifying, and material procurement of structures and components for electric generating stations (fossil, nuclear and hydroelectric).

Education - University of Connecticut - Master of Science in Engineering - 1965  
University of Notre Dame - Bachelor of Science in Civil Engineering - 1964

Licensed - Professional Engineering License - New Jersey

REPRESENTATIVE EBASCO PROJECT EXPERIENCE

Hydroelectric

Allegheny Power Service  
Centrais Electricas Brasileiras S/A

Davis Pumped Storage Project  
Peixoto Hydroelectric Development

Nuclear

Houston Lighting & Power  
PEPCO  
Northeast Utilities

Allens Creek Unit No. 1  
Douglas Point Unit No. 1  
Millstone Unit No. 1

Fossil

Arkansas Power & Light  
Dayton Power & Light

Lake Catherine Unit No. 4  
J M Stuart Unit No. 1

EBASCO EXPERIENCE (Since 1965)

Lead Discipline Engineer on various nuclear and hydroelectric stations. Activities include license and permit document preparations, design criteria preparation, design supervision, preparation of specifications, material procurement, and coordination with fabricators and constructors.

R A SULLIVAN

EBASCO EXPERIENCE (Since 1965) (Continued)

Items of responsibility on nuclear projects included containment vessel, structural steel and concrete, pipe restraints, pool liners, cranes, elevators, intake screens and switchyard structures.

Items of responsibility on hydroelectric projects included penstocks, gates, trash racks, cranes, and powerhouse framing.

Construction engineering for 3 years at a nuclear project site. Supervised erection of structural steel, reinforced concrete, lifting equipment, shielding plugs, pipe restraints, siding and roofing. Rigging Supervisor on main transformer, pumps, motors, tanks, and crane load tests. Assistant to Resident Engineer performing field design and procurement of structural items.

Two years as Designer for various fossil stations. Prepared design and drawings for building framing and platforms; intake hoist supports and screens; and circulating water pipe and manifolds.

RESUME--ROBERT C CHENG  
Principal Engineer

SUMMARY OF EXPERIENCE (Since 1962)

Total Experience—More than thirteen years in research and engineering with emphasis on structural analysis and design of industrial and power generating plants.

Major Field of Interest—Development of structural analysis, design and test programs for major generating projects.

Professional Affiliations— Registered Professional Engineer in the State of New York and Republic of China

Education— BSCE, Taiwan Provincial Cheng Kung University—1963  
MS, Structural Engineering, Virginia Polytechnic Institute—1965  
PhD, Engineering Mechanics, Pennsylvania State University—1972

REPRESENTATIVE EBASCO PROJECT EXPERIENCE

Nuclear

Carolina Power & Light Company	Shearon Harris Unit Nos. 1,2,3,4—each 960 MWe
Florida Power & Light Company	H.B. Robinson Unit No. 2—700 MWe
Houston Lighting & Power Company	St. Lucie Unit No. 2—890 MWe
Potomac Electric Power Company	Allens Creek Unit Nos. 1 and 2—each 1200 MWe
Tokyo Electric Power	Douglas Point Unit Nos. 1 and 2—each 1200 MWe
Chugoku Electric Power	Fukushima Unit No. 6—1100 MWe
Japan Atomic Power	Tokai Unit No. 2—1100 MWe
GE APEN	
Princeton Plasma Physics Lab.	Tokamak Fusion Test Reactor
ERDA	

ROBERT C CHENG

PRIOR EXPERIENCE (Continued)

Chemplant Designer, New York;  
Structural Designer (1 year)

Performed the wind analysis and design for the steel structure framework and heavy machine supports. Projects included Cape Fear and May Flower Chemical Plants.

Virginia Polytechnic Institute;  
Research Assistant (1 year)

Performed research work on reinforced concrete project and taught reinforced concrete courses.

Tai-Ann Construction Corporation;  
Assistant Engineer (2 years—Part-time)

Assisted in the stress analysis of the reinforced concrete and steel structures. Performed field survey.