UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

DIRECT TESTIMONY OF DRAGOS A. NUTA
REGARDING DOHERTY CONTENTION 5 -
SUPPRESSION POOL UPLIFT

Q. Would you please state your name and your position, and describe your educational and professional background?

A. My name is Dragos A. Nuta. I am the Mark III Task Leader responsible for assessing design and analysis/qualification aspects related to the Reactor Containment Building structures and systems/equipment, respectively. The statement of my background and qualifications is attached as Attachment DAN-1 to this testimony.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address Doherty's Contention No. 5 which alleges that the control rod drive mechanism hydraulic control units (HCUs) and tranversing 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 testimony addresses those positions of the contention which relate to matters within Ebasco Services Incorporated design responsi-

bility for the Allens Creek Nuclear Generating Station.

As the testimony 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.

Q. Could you please describe the physical layout of the HCU Modules in relation to the suppression pool LOCA water level?

A. 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 will be supported by beams and approximately 27 inch deep girders that span the annulus between the drywell and the 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.

Q. Please describe your analyses of vibrational effects on the HCU Modules due to suppression pool swell during a LOCA.

A. The steel platform supporting the HCU Modules was analyzed in order to establish the effect of the froth impingement portion of the LOCA loads determined by General Electric.

The results of the dynamic analyses included, among others, floor response spectra at the mounting points of the HCU modules. The floor response spectra peaks obtained are significantly lower than the dynamic capabilities of the HCU modules which are mentioned in the testimony by Peter Stancavage.

Q. Could you please describe the physical layout of the TIP Station in relation to the suppression pool LOCA water level?

A. 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 designed so that the bottom surface is immersed into the pool; this bottom surface will also be sloped upward 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.

Q. What are your conclusions?

A. Suppression pool swell effects during a LOCA will

not cause structural damage to the steel platform supporting the HCU modules nor the TIP Station supporting structure. Furthermore, the HCU modules will be subjected to dynamic loads significantly lower than their dynamic capability when the supporting floor is subjected to hydrodynamic forces associated with LOCA pool swell loads.

Attachment LAN-1

DRAGOS A. NUTA

EXPERIENCE SUMMARY:

Registered Professional Engineer with 15 years experience in the structural design and analysis of large industrial and nuclear power projects.

Supervisory work related to the structural design and analysis of large industrial or nuclear power projects.

Task leader for the Design Assessment and Load Improvement programs for the Allens Creek Mark BWR Containment and internal structures. Directed the development of loading criteria, analysis and design evaluations and verification of buildings and structures affected by the BWR Mark III Containment hydrodynamic loads.

As Lead (Discipline) Engineer on the Allens Creek Nuclear Generating Station (BWR), responsibilities included PSAR preparation and defense, preparation of design criteria, specifications, client correspondence, supervision of analyses, design, drawing preparation work. Participated directly in the process of static and dynamic analyses with special emphasis on the seismic (soil structure interaction), and impulsive and impactive analyses.

While assigned to the Allens Creek Nuclear Generating Station, Unit Nos. 1 and 2, participated directly in the process of structural static and dynamic analyses and design, PSAR, design criteria, and specifications preparation.

Interim assignments included the design of a hurricane protection system for the St. Lucie Nuclear Generating Station (work consisted of dynamic/static analyses of a sheet-pile system under cyclic wave type forcing function), and finite element analyses of the torus for the Tokamak Fusion Test Reactor Project.

EMPLOYMENT HISTORY

Ebasco Services Incorporated, New York, N.Y. - 1973-Present

Chemical Construction Corp. (Pollution Division); 1971-1973

System Engineer - Stress Analyst

Chemical Construction Corp. (Operations Division); 1966-1971

Project Engineer

Indiana State Highway Commission; 1966

Laboratory Assistant

EDUCATION:

Institute of Civil Engineering - Bucharest, Romania - 1961-1966
Purdue University - BSCE - 1966-1967
New York University (Master of Science Applied Math/Computer Science) 1968-1970

Academic Affiliations - Adjunct Professor, The City University of New York, The City College School of Engineering (Courses: Structural Analysis and Design of Nuclear Plant Facilities).

REGISTRATIONS:

Registered Professional Engineer in the States of New York and Indiana

PROFESSIONAL AFFILIATIONS:

Member - American Society of Civil Engineers
Member - ACI 349 Committee (Impulsive and Impactive Effects Working Group)
Member - ASCE Nuclear Standards Committee (Seismic Analysis of Safety Class Structures Working Committee)