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)	)	
	)	

TESTIMONY OF WILLIAM F. MERCURIO ON BEHALF OF HOUSTON LIGHTING & POWER COMPANY ON BOARD QUESTION 8 RELATING TO ACNGS REACTOR BUILDING SUBSURFACE SOIL MECHANICS

Q. Mr. Mercurio, please state your name and business address and describe your educational and professional experience.

A. My name is William F. Mercurio, and my business address is Ebasco Services, Inc., 2 World Trade Center, New York, N.Y. I have previously discussed by position and background in connection with my testimony on Biship Contentions 5, 7, 9 and 10.

A. The purpose of this testimony is to address Board Question 8 which requests evidence regarding the ability of subsurface soil to support the ACNGS reactor building. Soil mechanics rather than subsidence is of concern here with respect to avoiding unacceptable settling of heavy structures.

Q. What types of analyses verify the settling characteristics of soil with respect to soil mechanics?

A. Static settlement analyses are used to estimate the anticipated relative vertical displacements of structures supported by soil. Soil mechanic theoretical calculations coupled with actual soil property test data verify the soil settling characteristics.

Q. Would you briefly describe how the underlying materials at the ACNGS site were observed?

A. Geophysical surveys and borings were used to obtain field data for the development of subsurface cross-sections. The locations of all borings, geophysical surveys, observation wells and proposed excavations, as well as plant structures, are shown on PSAR Figures 2.5.4-5A, 5B and 5C. PSAR Section 2.5.4 provides a detailed discussion of data collection and observations.

Q. Would you describe what information the field data provided?

A. A detailed description of the subsurface material which was obtained from field exploration was presented in PSAR Section 2.5.4.3. The basic formations of the subsurface materials were identified as Beaumont, Montgomery, Goliad, and Fleming formation. The undisturbed

samples extracted from these formations were subjected to laboratory static and dynamic tests to investigate their strength characteristics, compressibility under heavy load and dynamic properties. The results of the laboratory tests, along with engineering interpretations, were presented in PSAR Section 2.5.6 and indicate high shear strengths and low compressibility. This data confirms that ACNGS is founded on soils which are more than capable of sustaining the loads to be imposed.

Q. Please describe the basic subsurface soil characteristics and analyses performed for the reactor building foundation.

A. The Reactor building mat foundation will rest on the Montgomery formation of predominately very dense and highly compact granular sand material with occasional overconsolidated clay layers appearing at the lower portion of the formation.

The mat foundation is to be placed on the very dense and highly compact Montgomery sand formation around elevation 104, which is about 28 feet below established plant grade. The maximum allowable bearing pressure for the reactor mat foundation design is 10 kips per square foot (ksf) under the static loading conditions. The mat foundation has a safety factor

greater than 20. Normally a safety factor of 1.5 is considered acceptable. A discussion of the method used and the design parameters for the analysis have been presented in PSAR Section 2.5.4.10.1.

Most of the settlement resulting from the consolidation of the granular material under loads will take place during the construction of the reactor building. Based upon consolidation test results and the effective imposed building load, the total settlement was calculated to be on the order of one (1) inch or less.

Q. What are your conclusions concerning this Board Question?

A. The Applicant has evaluated the subsurface soil conditions. On the basis of detailed test borings, geophysical exploration and extensive laboratory testing programs in conjunction with the structural requirements imposed by the buildings, the reactor building may be safely constructed on an earth-supported, reinforced concrete mat foundation.