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) )
)

DIRECT TESTIMONY OF DIRAN T. SIMPADYAN ON BEHALF OF HOUSTON LIGHTING & POWER CO. ON DOHERTY CONTENTION 27 - REACTOR PEDESTAL

Q. Please state your name and occupation.

A. My name is Diran T. Simpadyan. My business address is 160 Chubb Avenue, Lyndhurst, New Jersey. I am the civil engineer for the Reactor Pressure Vessel (RPV) pedestal design for Ebasco Services, Inc.

Q. Please describe your educational background, and professional qualifications.

A. A statement of my education and professional qualifications is attached to this testimony as Exhibit DTS-1.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to address Doherty Contention 27 which alleges that:

> The pedestal concrete of ACNGS may be weakened by the heat from a power excursion accident (PEA) or loss of coolant accident (LOCA) such that restart and operation of the reactor would endanger Intervenor's health and safety through subsequent reactor movement due to the original thermal damage to the pedestal.

Q. Briefly describe the purpose of the reactor pedestal.

A. The reactor pedestal is used to provide support for the reactor vessel throughout normal plant operation and postulated accident conditions. The reactor pedestal also provides support for the reactor biological shield wall.

Q. What are the physical characteristics of the reactor pedestal?

A. The reactor vessel pedestal will consist of two concentric steel cylinders having diameters of approximately 20 and 32 feet respectively. The annular space between the cylinders will be filled with ordinary non-reinforced concrete. This concrete will have a density of 140 pcf and does not have a load bearing function.

A continuous steel plate ring will be provided at the top of the pedestal; the cylinders will be anchored to the concrete mat at the bottom. The free standing RPV will be anchored to the pedestal by bolting the RPV support skirt to the top pedestal ring. The biological shield wall will also be supported on the RPV pedestal. Vertical and horizontal stiffeners will be provided throughout the height of the pedestal for joining the two concentric steel cylinders. All loads imposed on the pedestal will be resisted by the pedestal steel structure, i.e., the two concentric steel cylinders and associated vertical and horizontal stiffeners. Heavy stiffeners will be installed at the large rectangular openings necessary for control rod drive mechanism operation, maintenance and removal.

The outline of the pedestal embedment details are shown on ACNGS PSAR Figure 3.8-3. An outline of the pedestal structure is shown on ACNGS PSAR Figure 3.8-5.

Q. What loads are the reactor pedestal designed to withstand?

A. The ACNGS reactor steel pedestal is designed to withstand load and load combinations including heat resulting from a design basis accident as specified in PSAR section 3.8.3.3.1(b) and 3.8.3.3.2(b) respectively.

Q. Why is concrete used to fill the area between the two concentric steel cylinders of the reactor pedestal?

A. The primary purpose of the steel pedestal is to support the reactor. The concrete of the reactor pedestal provides no structural support for the reactor vessel. The fill concrete is used to add mass to the pedestal in order to obtain dynamic response of the structure within the frequency envelope for which the reactor is designed. Concrete fill also provides additional shielding.

Q. What would happen if the reactor pedestal concrete were to crack?

A. All postulated loads will remain the same. No structural support credit is taken for the presence of the concrete filler material nor will cracking of the concrete create any safety hazards.

Q. In his contention, Intervenor cites three events, one which he states occurred at Dresden Units II and III; one at the SL-1 reactor and the third at TMI 2. Please comment on the relevance of these three events to the ACNGS design.

A. In his contention the Intervenor alleges that the incidents at Dresden Units II and III in 1971 and the government experimental reactor SL-1 in 1961 damaged the reactor pedestals and that the ACNGS reactor pedestal could be similarly damaged.

The Intervenor draws upon sources of information identified in his contention. These sources include the testimony of three GE engineers before the Joint Committee on Atomic Energy in 1976 for the Dresden incident and an article found in volume 1 of the Technology of Nuclear Reactor Safety regarding SL-1. These sources of information have been reviewed and show that these incidents are not applicable to ACNGS.

The SL-1 incident involved a government stationary, low power test reactor. The dissimilarities between the support arrangement of this reactor and ACNGS make a design comparison pointless. Furthermore, the source of information quoted by the Intervenor does not state that damage occurred to the reactor support nor does it imply that reactor support failure contributed in any way to the accident. The testimony of the GE engineers regarding Dresden Units II and III states that the station utilizes a basic reinforced concrete pedestal. As previously discussed, ACNGS utilizes a steel pedestal. It should also be noted that during their testimony, the GE engineers only stated that weakening of the Dresden pedestal "<u>may</u> already have occurred." Subsequent investigations, including those by the NRC, have failed to support their allegations.

Regarding the accident at TMI 2 in 1979, Intervenor has failed to identify a source of information. TMI 2 is a PWR and is supported by a reinforced concrete foundation. ACNGS is a BWR and utilizes a steel reactor pedestal support arrangment. This steel reactor pedestal is of a different design than the TMI 2 reactor support and as previously stated, the ACNGS pedestal is designed to withstand design basis accident conditions.

Q. What are your conclusions concerning this contention?

A. The ACNGS reactor pedestal is not a concrete strucure as implied in the contention. Since the concrete fill has no load bearing function, any postulated weakening of the concrete is not relevant to the structural integrity of the reactor pedestal.

Exhibit DTS-1

EDUCATION AND PROFESSIONAL QUALIFICATIONS

DIRAN T. SIMPADYAN

SUMMARY OF EXPERIENCE (Since 1963)

Total Experience - 13 years of Civil Engineering experience consisting of structural analysis and design of Fossil and Nuclear Power Plants, highways and research in foundation engineering.

Major Field of Interest - Structural analysis and design of electric generating stations with special emphasis on heavy steel structures.

Education - BSCE-University of Wyoming, 1968
MSCE-University of Wyoming, 1970
MBS-Farleigh Dickinson University, 1978

Advance Courses - Theory of Electricity
Theory of Plates and Shells

Licensed - Registered Professional Engineer - New York and New Jersey

EBASCO EXPERIENCE (Since 1974)

Civil Engineer (7 years)

Senior Civil Engineer responsible for the structural analysis and design of PWR and BWR type nuclear power plants including establishing design criteria, supervision of design and reviewing drawings for the fuel handling building, turbine building and reactor containment structures such as the containment vessel, reactor pedestal, biological shield wall, pipe restraint structures and platforms; preparation and review of PSAR; preparation of responses to NRC questions. Responsibilities in the procurement area consist of preparation and review of specifications, evaluation of bids and making recommendations for awarding contracts and change orders for the containment vessel, structural steel, polar crane, fuel handling crane, pool liners, tanks and special doors.

PRIOR EXPERIENCE (6 years)

Sanderson and Porter Inc. New York: Senior Design Engineer

Responsible for checking the structural analysis, design calculations and drawings for the turbine building, precipitators and miscellaneous structures, resolve interface problems and details for additions to existing structures for the Milton R. Young Station, Minnkota Power Company.

Foster Wheeling Corp., New Jersey: Senior Design Engineer

Responsible for the structural analysis and design of boiler supporting structures and associated components for power plants including heavy steel framing, pipe hangers, flues and ducts, preparation of framing plans, basis and connections. Representative projects include Central Illinois Public Service Co., Public Service of New Mexico and the power companies for Abono and Puentes in Spain.

Frederic R. Harris Inc., New Jersey: Civil Engineer

Responsible for the design of retaining walls and foundations for highway bridges including drainage facilities and construction scheduling for the extension of the Garden State Parkway.

Hardesty & Hanover, New York: Engineer

Responsible for the preliminary design of a vertical lift bridge by the orthotropic deck, steel plate deck and composite design methods including the tower structures and preparation of the cost comparison.

University of Wyoming, CE Department: Research Assistant

Engaged in experimental research related to the stress distribution under footings.

Brown Engineers, New Jersey: Engineer

Engaged in design and layout of highways.