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 1)	)	

NRC STAFF TESTIMONY OF WILLIAM S. BIVINS

ON POTENTIAL REQUIREMENTS FOR DREDGING

OF THE SAN BERNARD RIVER TO TRANSPORT

THE REACTOR PRESSURE VESSEL

Q: Will the witness please state his name, place of employment, and duties he performs?

A: My name is William S. Bivins and I am employed by the Hydrologic and Geotechnical Engineering Branch, Division of Engineering, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission. I am the Leader of the Hydrologic Engineering Section. A copy of my professional qualifications is attached to this testimony.

Q: What is the purpose of your testimony?

A: It has been alleged that transportation of the reactor pressure vessel (RPV), and appurtenant equipment, by barge up the San Bernard River, will

require dredging of the River. Further, it is contended that dredging for passage of the barge may or will disrupt marine life, cloud the water, destroy river bottom life, require spoil disposal and promote increased industrial use of the river, resulting in secondary environmental impacts. The purpose of my testimony is to respond to this contention.

Q: Have you participated in the review of the potential impacts of transporting the RPV by barge up the San Bernard River with regard to the need for dredging?

A: Yes.

Q: What is the nature of your involvement in that review and assessment?

A: Under my direct supervision, members of the Hydrologic Engineering Section have compiled information from the Applicant, the Corps of Engineers, and the Coast Guard which describe the required navigation channel capacity, and anticipated impediments (if any) to navigation, respectively. I have assessed these data and information in order to identify the impact of transporting the RPV by barge up the San Bernard River.

Q: In response to the above listed contention, what is the general scope of this testimony?

A: The San Bernard River, in the reach to be used by the Applicant for transportation by barge of the RPV, is part of a U.S. Corps of Engineers

San Bernard navigation channel. As such, its design dimensions are maintained by periodic dredging. The dimensions of the Channel are adequate for the barge proposed by the applicant. No dredging is expected to be required solely to pass the applicant's barge. Should conditions in the channel be modified by aggradation, degradation or accretion of debris (which are, incidentally, part of natural processes in rivers) the periodic maintenance program of the Corps of Engineers will return the channel to its project dimensions. While improbable, such impediments could coincide precisely with the transportation of the RPV. Removal of the impediments would produce environmental impacts which are no different than those produced during normal channel maintenance.

Thus, there are no adverse environmental impacts which will accrue solely as a result of transporting the RPV by barge.

Q: Would you explain in greater detail how you conclude the river is large enough to pass the RPV barge.

A: Yes. I will first describe the required capacity within the navigation channel for transportation of the RPV by barge.

The barge dimensions required to transport the RPV have been reported by the Applicant to be 204.0 feet long, 43.5 feet wide and 12.7 feet deep. Ladened, the barge is expected to draw about 8 feet.

Vertical clearance is also a controlling dimension. The diameter of the RPV is 22 feet. The estimated depth (thickness) of the barge less the submerged portion gives the freeboard, or that portion of the barge above water. The freeboard is (12.7 - 8.0 =) 4.7 feet. If the RPV is carried at deck level (which is common) rather than within the barge (which for this consideration is non-conservative) the total height above water is 4.7 feet plus 22 feet, or about 26.7 feet.

The controlling dimensions are 204 feet long, 43.5 feet wide, 8 feet below the water surface and less than 30 feet above the water surface.

I will now describe the navigation channel of the San Bernard River.

The channel of the San Bernard River, between the Gulf Intercoastal Waterway and rivermile 26-27 is part of a Corps of Engineers' navigation project. The project dimensions of the channel are 100 feet wide by 9 feet deep. The depth is measured from the water surface at mean low water.

The vertical clearance is measured from the water surface and is usually limited by bridges or other structures. The following three bridges cross the San Bernard River in the reach under consideration.

Location	Vertical Clearance
River Mile 11.1	45 feet MHW [1/]
River Mile 17.3	45.5 feet MHW
River Mile 20.7	See text below

[1/] MHW. mean high water

The bridge at river mile 20.7 is a swing bridge for railroad traffic with essentially unlimited vertical clearance. However, the bridge restricts navigation due to a limited horizontal clearance of 50 feet. This clearance is adequate for the proposed 43.5 ft. wide barge.

Q: What are the maintenance requirements of navigation projects in general and of the San Bernard River Channel in specific?

A: Navigation channels require maintenance which usually involves dredging of shallow areas (shoals) and removal of snags.[2/] The Corps of Engineers maintains the San Bernard Project.

The last major redredging of the channel occurred in 1973 in selected reaches of the river (RM 0.0 - 0.76, RM 17.5 - 17.7, 22.8 - 23.5 and 25.0 - 26.0). Shoaling at the mouth of such rivers is not uncommon and the reach RM 0.0 to 0.76 was redredged in June 1977. Shoaling in the balance of the project length is minimal. However, the Corps of Engineers yearly dredges portions of the channel to maintain the project dimensions of 9 feet deep by 100 feet wide. No snags have been encountered.

Q: Is the San Bernard Navigation channel used for commercial transport?

[2/] Snags are "clumps" of debris such as trees, branches, timber, lumber and the like. Snags tend to start in shallow areas and "grow" by snaging additional floating debris. At the extreme, snags can impede navigation.

A: Yes. Barge traffic on the San Bernard River is not infrequent, and no significant difficulties are experienced in transiting the river. Most of the barge traffic appears to be between River Mile 0.0 and docking facilities at River Mile 20.7 in the vicinity of the railroad swing bridge. However, a barge loading slip is maintained just across the river from the site of the proposed barge landing slip.

Q: Are there any unique impacts to the river expected due to passage of the RPV barge up the river?

A: No. Any impacts would be similar to those resulting from other barge traffic and is consistent with the impacts anticipated from such projects. Further, impacts associated with maintenance of the project, including dredging, accrue annually and are not attributable to the transport of the RPV barge.

Q: Is it possible that dredging might be required at the time of transport of the RPV to provide adequate clearance?

A: Yes. While it is improbable, shoaling could occur at the precise time to impede transit of the RPV barge. It is more likely that shoaling would be noted by other traffic, that the Corps of Engineers would be notified, and that the impediment would be expeditiously removed by the Corps of Engineers. Regardless of who removed the impediment, the impacts would be those of normal maintenance and would not be unique to the RPV barge traffic.

William S. Bivins, Leader
Hydrologic Engineering Section
Hydrologic and Geotechnical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

Professional Qualifications

I am the Section Leader, Hydrologic Engineering Section on the staff of the Hydrologic and Geotechnical Engineering Branch, Division of Engineering.

My formal education consists of study in civil engineering at New Mexico State University, where I received a B.S.C.E. in 1966, and a M.S. in Water Resource Management from the University of Wisconsin in 1969. The graduate study was as a Planning Fellow under total sponsorship of the Corps of Engineers. I have had courses in hydrology, water resources, fluid mechanics, engineering construction, soil mechanics, water supply, geology, hydro-geology, economics, water law, urban and regional planning, and advanced mathematics.

My present employment with the NRC (formerly the AEC) dates from 1972 in the area of hydrologic engineering with the Division (now Office) of Nuclear Reactor Regulation, with the Office of Standards Development, and for consultation on siting of materials facilities, and on environmental matters. My responsibility in the licensing review of nuclear facilities is in the area of flood vulnerability, adequate water supply, and surface and groundwater acceptability of effluents. In addition, I participate in the development of Regulatory Guides in these areas of interest.

From 1970 to 1972, I was a Hydraulic Engineer with the Southwestern Division of Corps of Engineers, Dallas, Texas. I was responsible for the hydrologic review of multi-purpose dams, flood control projects, navigation projects, and coastal engineering development. The projects included those of the five districts of the Southwestern Division of the Corps of Engineers and included parts or all of the states of Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana.

From 1966 to 1970, I was a Hydraulic Engineer with the Corps of Engineers, Albuquerque District, Albuquerque, New Mexico. I worked on hydrologic engineering and hydraulic design projects such as multi-purpose reservoirs, channels, and levees in New Mexico, Colorado, and Kansas; including estimates of long-term water availability, and hypothetical flood events. I prepared hydrologic engineering estimates for major flood control levee systems including the water salvage potential of such projects.

I have published in the Journal of the American Society of Civil Engineers and in internal technical papers of the Corps of Engineers. I am a registered Engineer-In-Training in the State of New Mexico. I am a member of the American Society of Civil Engineers, American Association for the Advancement of Science, and the American Geophysical Union.