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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
LOUISIANA POWER & LIGHT)	
COMPANY)	Docket No. 50-382
)	
(Waterford Steam Electric)	
Station, Unit 3))	

APPLICANTS'S TESTIMONY OF KEVIN P. TWINE
ON RADIOLOGICAL EMERGENCY RESPONSE PLANS,
CONTENTION 17/26(1)(b)

My name is Kevin P. Twine. I am Supervising Resources Planner at Ebasco Services, Inc., in charge of special projects involving land use, demographics, and socioeconomics. I hold a Master of Regional Planning degree from the University of North Carolina. My project-related experience with nuclear facilities includes work on environmental reports and safety analyses for four nuclear power plants, one national laboratory, one fusion test reactor, and one decontamination project. This work has involved detailed demographic work, detailed land use studies, studies of agricultural parametrics, and work relating to socioeconomics, aesthetics, and cultural resources, in accordance with the standards of NRC Regulatory Guides 4.2

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and 1.70. In addition to Waterford 3, the nuclear power plant projects on which I have worked are located in Florida, Greece, and the Phillipines. For the Florida project, my work on population served as input to the evacuation time estimate which was undertaken there. My involvement with nuclear projects has also included the land use studies for the Oak Ridge National Laboratory Environmental Report, and the demographics and land use work for the Tokamak Fusion Test Reactor in Princeton, New Jersey. I also managed an environmental report and engineering plan for decontamination of a uranium processing facility in New Jersey.

In addition, I have been responsible for the supervision of traffic impact studies for one coal-fire generating station in upstate New York, and two large synthetic fuels plants in the northeast, for which I oversaw the work of traffic engineering subcontractors in the performance of these studies. Prior to joining Ebasco, I was responsible for coordinating traffic plans for a new town in Florida, and was in charge of the traffic planning efforts of the Portland, Maine Planning Department.

While at Ebasco, I have also had substantial experience in dealing with the environmental impacts of major industrial projects other than nuclear facilities. I was responsible for preparing the land use and socioeconomic elements of the environmental report for a 600 MW plant on the Ohio River, and was also responsible for directing a comprehensive study of

socioeconomic and land use impacts of the Lake Erie Generating Station in upstate New York. My experience also includes several siting studies for coal-fired power plants, including a 1600 MW plant in Louisiana, a 1500 MW plant in Washington State, and a 2000 MW complex in British Columbia. A summary of my educational and professional experience and qualifications is attached.

My testimony will address Joint Intervenors' Contention 17/26(1)(b) which reads as follows:

The roads and highways necessary for [evacuation of individuals located within the 10-mile plume exposure pathway emergency planning zone] are inadequate.

I should note at the outset that neither Federal Emergency Management Agency (FEMA) nor NRC regulations and criteria for emergency preparedness plans require the addition or upgrading of roads and highways for evacuation. Nor do FEMA and NRC have requirements for maximum acceptable evacuation times. However, Evaluation Criterion J.8 of NUREG-0654^{1/} specifies that the applicant must provide an evacuation time estimate study for the ten-mile plume exposure pathway Emergency Planning Zone ("EPZ") surrounding the site, which includes estimates of evacuation times under various conditions. This study is to be in accordance with Appendix 4 of NUREG-0654.

^{1/} "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, NUREG-0654/FEMA-REP-1, Rev. 1, November 1980.

The primary benefit of the evacuation time estimate study is to provide the officials responsible for making protective action decisions in the event of a radiological emergency with a means to help determine whether, and the extent to which, evacuation is an appropriate protective action response in the specific circumstances surrounding a particular accident. The Waterford 3 study is based on an in-depth analysis of specific and detailed plans for evacuation unique to the Waterford 3 plant and its environs. Moreover, the computer model used for the study can be updated from time to time as appropriate to reflect physical and demographic changes which may occur in the area. The availability of the evacuation time estimate study, in conjunction with the onsite and offsite radiological emergency response plans, provides assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Louisiana Power & Light, through contract with Ebasco Services, Inc., submitted an evacuation time estimate study to the NRC on June 25, 1980, in response to a request dated December 26, 1979, from Brian K. Grimes, Director of NRC's Emergency Preparedness Task Group, to applicants for construction permits and operating licenses. A revised report was submitted February 26, 1982.^{2/} While the basic methodology for predicting evacuation response times remained essentially

^{2/} "Evacuation Time Estimate," Waterford Steam Electric Station, Unit No. 3, Rev. 1, February 1982.

unchanged, the revised report reflects the plans and assumptions in the current offsite emergency response plans for Waterford 3. It also contains some additional information to conform to the guidance in Appendix 4 to NUREG-0654, which was issued subsequent to the original study.

My role in the conduct of the evacuation time study, as an employee of Ebasco Services, Inc. was to supervise the collection of data on population, industries, and institutional facilities in the area, and to oversee the conduct of traffic planning studies and the implementation of the evacuation model. I have been closely involved with the Waterford 3 project since 1976, and have visited the site area numerous times. I have dealt with many local and state officials, as have other members of the evacuation time estimate study team. We had therefore built up a substantial data base, and were thoroughly familiar with the Waterford 3 environs by the time we were called upon to do the evacuation time estimate. During the course of that study, I personally visited the site area and traveled throughout the EPZ several times. The project team (including myself) met with Parish civil defense officials and other responsible persons. The evacuation time estimate has therefore been prepared with a thorough appreciation of local conditions.

The evacuation time estimate study will assist Parish officials in arriving at their protective action decisions. The evacuation time estimate examines two general scenarios,

clear and adverse weather, and displays the results in a form which is conducive to quickly identifying the estimated times for evacuation of portions or all of the plume EPZ. The time estimate is therefore a tool for local officials to use in implementing their protective actions, for it is an estimate against which they can judge the advisability of evacuation under actual conditions.

A computer simulation model was utilized in the evacuation time estimate study. The model is a dynamic, time dependent model which can account for the movement and delay of vehicles on a minute-by-minute basis. The use of a computer simulation model offers two main advantages. First, it approximates, as realistically as possible, actual vehicle movement, allowing for the identification of roadways and intersections where traffic control may be needed or where routing could be modified to maintain vehicle movement. Secondly, a computer simulation model is relatively easy to update and revise to reflect new information, such as changes in population levels and changes to the highway network.

The methodology used relies on actual demographic and transportation information. The study utilized 1982 population projections derived from the 1980 census for the area, and field studies on special facilities and the roadway network conducted in February, 1980 and January, 1982. The roadway network data consisted of determining the major routes which could be utilized for evacuation, as well as the size of these

routes (i.e., number of lanes), the capacity of the roadways (number of vehicles/hour), the type of roadway (two lane rural, multi-lane, etc.) and the average design speed for each route. In addition, information was also collected on the intersections along each route, the traffic controls at each intersection, and identification of any other features which could potentially cause traffic delays or congestion. The information and assumptions used are provided in the evacuation time estimate report.

The demographic and roadway network information bases were combined and placed into the computer model, along with certain assumed conditions, to develop the evacuation time estimates for twelve specified sectors within the plume EPZ. The transient, resident and institutional population was assigned to various evacuation routes, and times were calculated for their evacuation from each area under both clear and adverse weather conditions. The results of the initial study were submitted to the NRC for review and were available to Louisiana Power & Light and Parish officials as an assistance to the development of the emergency plans for St. Charles Parish and St. John the Baptist Parish.

In the period between completion of the initial time estimate study and the current revision, the NRC issued NUREG-0654 containing its final guidance on the format requirements for evacuation time estimates, and the Parishes' detailed plans for evacuation were completed. These included the use of

an outdoor siren warning system which was not assumed in the original study. The recently completed revised time estimate study incorporates the changes needed to reflect these developments, and is responsive to the advice of NRC's evacuation time study consultant concerning the evacuation model. Further, the most recent estimate was developed in consultation with Parish officials in order to more closely reflect the methods and policies which might actually be utilized in the event of an evacuation.

The evacuation time estimate study realistically demonstrates that, given the present roadway network, evacuation of all or a portion of the plume EPZ is an implementable protective response available for consideration by Parish officials should a radiological emergency occur at Waterford 3. The decision to undertake evacuation, either as the only protective response or in combination with other protective responses, is one which must be made in light of conditions as they are occurring at the time of the need to take action. An updated evacuation time estimate will be a valuable tool to assist Parish officials in making that decision.

KEVIN P. TWINE

Supervising Resources Planner
Ebasco Services, Inc.

Education: B.A., History, Wesleyan University, 1965.
M.R.P., Regional Planning, University of
North Carolina, 1967.

Experience: 1979 to Present and 1974 to 1978: Supervising
Resources Planner, Ebasco Services, Inc. Responsible
for the supervision and preparation of land use,
demographic and socioeconomic impact studies of major
industrial facilities, including four nuclear
power plants, one national laboratory, one fusion
test reactor and one decontamination project. With
respect to these nuclear projects, responsibilities
have included the preparation of environmental reports
and safety analyses dealing with land use studies,
studies of agricultural parameters, aesthetics and
cultural resources, in accord with NRC Regulatory
Guides 1.70 and 4.2. This position has also included
responsibility for the supervision of traffic impact
studies for several major industrial facilities.

1978 to 1979: Consultant, Fantus Company. Involved
in the performance of siting studies for the corporate
headquarters of five Fortune 500 companies.

1972 to 1974: Land Planner, Florida Gas Company.
Responsible for land and traffic planning for the
Orangewood New Town and other planned residential
communities.

1969 to 1972: Community Development Coordinator, City
of Portland, Maine Planning Department. Responsible
for the development of a downtown urban renewal plan
and in charge of traffic planning efforts.

1968 to 1969: Consultant, Gassner, Nathan, Browne.
Performed population-economic base studies for three
cities.

1967 to 1968: Memphis and Shelby County, Tennessee
Planning Commission. Involved in the development of
city parks and recreational plans.

Professional
Affiliations: American Society of Photogrammetry.