January 14, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'85 JAN 17 P1:58

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	
and NORTH CAROLINA EASTERN	)	Docket No. 50-400 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant)	)	

AFFIDAVIT OF ROBERT D. KLIMM
ON EPJ-4(d)

County of Middlesex	)	
	)	ss.
Commonwealth of Massachusetts	)	

ROBERT D. KLIMM, being duly sworn, deposes and says:

1. I am an Associate of HMM Associates, Inc. My responsibilities at HMM Associates include the management and supervision of evacuation time studies. I have served as either Project Manager or Principal Transportation Engineer for many of the more than twenty evacuation time analyses conducted by HMM Associates in connection with emergency planning for nuclear power plants. I was Principal Transportation Engineer for the evacuation time estimate study prepared by HMM Associates for the Shearon Harris plume exposure Emergency Planning Zone (EPZ). That study is entitled "Evacuation Time Estimates for

the Plume Exposure Pathway Emergency Planning Zone of the Shearon Harris Nuclear Power Plant" (October 1983) (hereinafter referred to as "ETE"). I am also responsible for all transportation-related computer analyses conducted by HMM Associates. I was involved in the system development of the NETVAC evacuation model, which is a state of the art computer evacuation simulation model. The NETVAC model has been used to estimate evacuation times for approximately 20 nuclear power plant sites. I co-authored the NETVAC model users manual. In addition, I have provided training to various groups on the use of the NETVAC model. A current statement of my professional qualifications and experience is attached hereto. My business address is 336 Baker Avenue, Concord, Massachusetts 01742. I have personal knowledge of the matters stated herein and believe them to be true and correct. I make this affidavit in response to EPJ Contention 4(d).

2. The purpose of this affidavit is to explain that even if some parents should ignore the emergency public information broadcast at the time of an emergency and attempt to pick up their children at their schools, such behavior would not affect the evacuation times provided in the ETE.

3. The ETE did not assume an instantaneous evacuation of the public following notification of an emergency. Rather, as identified in section 6 of the ETE, the methodology used in the ETE incorporated a range of preparation and mobilization times

(up to 2 hours and 15 minutes), to account for all cases, including individuals who are already at home at the time an evacuation is ordered and need little preparation time, as well as those with more extensive preparation activities -- e.g., leaving work and traveling home to pick up family before evacuating; returning home from shopping trips; and making intermediate stops on the way home prior to evacuation (i.e., stops at gas stations, stores, etc.). Intermediate stops for some vehicles to pick up children at school could also reasonably be included in this time period. Thus, although the ETE did not specifically consider the possibility of parents driving to school to attempt to pick up their children, the ETE did incorporate a sufficiently broad range of preparation/mobilization times so that any such activity would not affect the evacuation times provided in the ETE.

4. Similarly, the methodology used for the ETE intentionally incorporated some double counting of population and vehicle demand estimates, to more appropriately account for traffic friction which would result from vehicles making intermediate stops prior to evacuating, such as leaving work and stopping at home prior to evacuating or leaving recreational areas and stopping at home prior to evacuating. The inclusion of some vehicles going to schools to attempt to pick up students prior to evacuating could also fall into this category. Accordingly, although the ETE did not specifically consider the

possibility of some parents driving to school to attempt to pick up their children prior to evacuating, it did implicitly consider the traffic friction which would result from such behavior. Therefore, while it is unlikely and unexpected that large numbers of parents would drive to schools to attempt to pick up students, even if some parents did travel to schools for this purpose, it would not significantly affect the evacuation time estimates presented in the ETE.

5. In summary, the ETE incorporated a broad range of preparation/mobilization times, and simulated the traffic friction on the evacuation roadway network which would be associated with preparation/mobilization activities involving pre-evacuation travel. Therefore, even if some parents should attempt to pick up their children at their schools in an emergency, such behavior would not significantly affect the evacuation times provided in the ETE.

Robert D. Klimm

Robert D. Klimm

Sworn to and subscribed before me this 11th day of January, 1985.

Carol Nair

Notary Public

My Commission expires:

[redacted]

ROBERT D. KLIMM

Education

M.S.	Civil Engineering (Transportation), Northeastern University, 1979
B.S.	Civil Engineering, Worcester Polytechnic Institute, 1975

Summary of Experience

Mr. Klimm specializes in transportation engineering and emergency preparedness/evacuation planning. He has served as Project Manager or Technical Advisor on most of the evacuation time estimate analyses conducted by HMM. He also has been responsible for numerous emergency preparedness tasks for nuclear power plants including: the development of school facility evacuation plans and procedures; the development of evacuation and population data for CRAC2 and CRACIT consequence modeling; and the development of evacuation routings and time estimates for special facilities.

Mr. Klimm was involved in the system development of the NETVAC evacuation simulation model, which has been used at 20 nuclear power plant sites throughout the country. He has provided training to groups that have been licensed to use the NETVAC model, and was responsible for conducting an Evacuation Time Estimate Workshop for Public Service Electric and Gas Company of New Jersey.

Professional Experience

1980 - Present	HMM Associates. Mr. Klimm serves as Project Manager and/or Principal Engineer for projects involving emergency preparedness planning and emergency evacuation. Recent experience includes the following:

- o Principal Engineer for the development of evacuation time estimates for the Susquehanna Steam Electric Station (Luzerne County, Pennsylvania, 1981).
- o Project Manager for the preparation of supplemental evacuation time estimates for the Midland Nuclear Power Plant (Midland, Michigan, 1983).
- o Project Manager for the development of evacuation time estimates for the D.C. Cook Nuclear Plant (Berrien County, Michigan, 1984).

- Project Manager for the development of an Evacuation Traffic Management Plan for the Midland Nuclear Power Plant Plume Exposure EPZ (Midland, Michigan, 1983).

- Principal Engineer for the preparation of evacuation time estimates for the Shearon Harris Nuclear Power Plant (Wake County, North Carolina, 1983).

- Project Manager for the development of an Evacuation Traffic Management Plan for the primary Plymouth Station Evacuation Relocation Center (Hanover, Massachusetts, 1983).

- Principal Engineer for the development of population and evacuation data for CRACIT radiological consequence modeling within the Seabrook Station EPZ (Seabrook, New Hampshire, 1983).

- Project Manager for the development of an Evacuation Traffic Management Plan for the Seabrook Station Plume Exposure EPZ, (Seabrook, New Hampshire, 1982).

- Project Manager for the preparation of evacuation time estimates for the Grand Gulf Nuclear Station (Claiborne County, Mississippi, 1981).

1977-1980 Fay, Spofford & Thorndike, Inc. Transportation Engineer. Responsible for traffic operations analyses; traffic control design, specifications and cost estimates; transportation environmental impact analyses; highway safety analyses; truck circulation studies, and traffic circulation plans for private and public developments.

1975-1977 Central Massachusetts Regional Planning Commission. Transportation Engineer/Planner. Responsible for transportation corridor planning studies, transportation systems management, traffic operations analyses, and coordination of the regional transportation air quality control plan.

Other Professional Data

Affiliations: Transportation Research Board: National Academy of Sciences
Institute of Transportation Engineers
American Society of Civil Engineers
Boston Society of Civil Engineers

Papers/ Publications:

- Klimm, R., "Comparison of Optional Cycle Lengths for an Urban Arterial Signal System Using Maximum Bandwidth and Minimum Vehicle Delay Criteria," Northeastern University, 1979.
- Klimm, R., "Fringe Parking and Intermodal Transportation System--Feasibility Study," CMRPC, 1976.
- Klimm, R., Sheffi, Y., Mahnassani, H., Powell, W., NETVAC2 USER MANUAL," HMM Associates, 1982.