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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
)  
CAROLINA POWER & LIGHT COMPANY )  
AND NORTH CAROLINA EASTERN )  
MUNICIPAL POWER AGENCY )  
)  
(Shearon Harris Nuclear Power Plant) )  
)

Docket No. 50-400 OL

AFFIDAVIT OF ROBERT D. KLIMM ON EPJ-1

County of Middlesex )  
) S.S.  
State of Massachusetts )

Robert D. Klimm, being duly sworn deposes and says as follows:

1. I am an Associate with HMM Associates. My business address is 336 Baker Avenue, Concord, Massachusetts 01742. A summary of my professional qualifications and experience is attached hereto as Attachment 1.

2. My responsibilities at HMM Associates include the management and supervision of evacuation time estimate studies. I have served as either Project Manager or Principal Transportation Engineer for many of the evacuation time estimate analyses conducted by HMM Associates, including the evacuation time estimate study prepared for the Shearon Harris plume exposure Emergency Planning Zone (EPZ). I have testified before the Atomic Safety and Licensing Board for the Big Rock Point Plant. 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 at 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.

3. The Applicants' Evacuation Time Estimates (ETE) study ("Evacuation Time Estimates for the Plume Exposure Pathway Emergency Planning Zone - Shearon Harris Nuclear Power Plant," HMM Associates, 1983) does consider adverse weather conditions pursuant to NUREG-0654, Rev. 1, Appendix 4 guidance. The adverse weather evacuation time estimates presented in the Applicants' study represent what is defined as a heavy or severe rainstorm condition, resulting in a 25 percent reduction in roadway capacity. Fair weather, as used in the ETE, refers to conditions where roadways are clear and dry, and visibility is not impaired. Adverse weather refers to conditions where visibility is impaired, roadway capacities reduced, and normal traffic operations impeded compared to fair weather conditions.

4. In developing this adverse weather scenario, consideration was given to all adverse weather conditions which occur within the Shearon Harris EPZ. This included rain, fog, flooding, snow, ice and high winds. Discussions between HMM Associates, CP&L and state and county emergency preparedness officials, and a review of weather frequency data presented in the Shearon Harris FSAR led to the selection of a heavy rainstorm condition as the most appropriate for the evacuation time estimate study. The selected scenario represents a condition which is severe enough and occurs often enough to provide a reasonable frame of reference for protective action decision making during adverse weather conditions.

5. Evacuation times were not developed for every conceivable fair and adverse weather scenario, nor is such required by Appendix 4 of NUREG-0654, Rev. 1. The intent of the NUREG-0654, Rev. 1 requirement to assess adverse weather conditions is that the evacuation time estimates should address a condition which would be helpful to decision-

makers in the event of an accident. The adverse weather condition or conditions should clearly not be so severe, or so lacking in severity that they represent scenarios which result infrequently.

6. Evacuation time estimates consider several factors which state and local decision-makers will be aware of when considering any protective actions. Elements of the evacuation times include consideration of varying population levels and roadway conditions associated with different times of day, times of year, and weather conditions. By being familiar with the evacuation time estimates, the decision-maker is made aware that the above list of considerations has an impact on the time required for evacuation of all or part of the EPZ, and that the estimates are one of several tools that must be used to determine the correct course of action. The time required to evacuate the EPZ is a representative figure, and is designed for use in combination with other available data such as plant prognosis, forecasted weather, and estimated time of plume arrival. Evacuation time estimates provide the decision-maker with quantitative data for incorporation into the process of determining a protection action. It is certainly possible that special conditions may present an altered set of circumstances that may not be specifically represented in the time estimates. At the local level, officials can most effectively assess the probable impact of any number of unusual conditions within the EPZ that may result in higher or lower population levels, temporary roadway changes (i.e., due to construction or re-construction activities), or unusual weather conditions. Such conditions can be evaluated on a case-by-case basis and used as additional input in the protective action decision-making process.

7. In light of this and considering 1) the Intervenor's definition of "severe snow and ice condition" as "anything over 1/2 inch of snow in a 24-hour period," 2) average snowfall as discussed in the Affidavit of Brian D. McFeaters, and 3) the time estimates for clearing all routes in the EPZ and evacuation routes outside the 10-mile zone of

average snowfalls provided in the Affidavit of M.C. Adams, it would be expected that the evacuation times during such an adverse weather condition may be somewhat higher than those during a heavy rainstorm condition. However, in my professional opinion, the evacuation times would not be expected to be significantly greater. Those deciding on what protective actions should be taken in case of emergency would evaluate such factors in making their determination. Of course there may be times in an emergency, due to weather or otherwise, where evacuation is not a viable option.

8. State and county emergency preparedness officials were involved with, and provided key input to the evacuation time estimate study. Many of the variables which must be considered in such a study (such as reasonable preparation and mobilization times, evacuation procedures, adverse weather, etc.) are site-specific or area-specific, and can most appropriately be identified by local personnel who are responsible on a day-to-day basis for planning for such activities. In addition to providing key input to the study and reviewing the assumptions to be used, the state and county emergency preparedness officials also reviewed a draft of the evacuation study. In concurring with the evacuation time estimate report, these officials have indicated that based upon their knowledge of the area, federal guidance (i.e., NUREG-0654, Rev. 1) and the evacuation process in general, the ETE, including the treatment of the adverse weather scenario, provides a reasonable basis for protective action decision-making for a potential incident at the Shearon Harris plant.

9. Based upon the above information, it is my opinion that the evacuation time estimate study has accurately and appropriately assessed adverse weather, as required by Appendix C of NUREG-0654, Rev. 1, and that while an average snowfall meeting the Intervenors' definition of severe snow and ice conditions may somewhat extend the adverse weather evacuation times, it would not have a significant effect on those estimates and would in any event be taken into account by the decision-maker in determining appropriate protective actions.

This is the 6<sup>th</sup> day of December, 1984

Robert D. Klimm  
Robert D. Klimm

Sworn to and subscribed before me  
this 6<sup>th</sup> day of December, 1984.

Paul J. Moran  
Notary Public

My commission expires: "My Commission Expires April 12, 1985"

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).

- o Project Manager for the development of an Evacuation Traffic Management Plan for the Midland Nuclear Power Plant Plume Exposure EPZ (Midland, Michigan, 1983).
  - o Principal Engineer for the preparation of evacuation time estimates for the Shearon Harris Nuclear Power Plant (Wake County, North Carolina, 1983).
  - o Project Manager for the development of an Evacuation Traffic Management Plan for the primary Plymouth Station Evacuation Relocation Center (Hanover, Massachusetts, 1983).
  - o Principal Engineer for the development of population and evacuation data for CRACIT radiological consequence modeling within the Seabrook Station EPZ (Seabrook, New Hampshire, 1983).
  - o Project Manager for the development of an Evacuation Traffic Management Plan for the Seabrook Station Plume Exposure EPZ, (Seabrook, New Hampshire, 1982).
  - o Project Manager for the preparation of evacuation time estimates for the Grand Gulf Nuclear Station (Clairborne 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:
- o Klimm, R., "Comparison of Optional Cycle Lengths for an Urban Arterial Signal System Using Maximum Bandwidth and Minimum Vehicle Delay Criteria," Northeastern University, 1979.
  - o Klimm, R., "Fringe Parking and Intermodal Transportation System--Feasibility Study," CMRPC, 1976.
  - o Klimm, R., Sheffi, Y., Mahnassani, H., Powell, W., NETVAC2 USER MANUAL," HMM Associates, 1982.



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CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Motion for Summary Disposition of CCNC Contention 8," "Applicants' Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard," "Affidavit of Dayne H. Brown In Support of Applicants' Motion for Summary Disposition of CCNC Contention 8," "Applicants' Motion for Summary Disposition of EPJ-1," "Applicants' Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard on EPJ-1," "Affidavit of Brian D. McFeaters on EPJ-1," "Affidavit of Robert D. Klimm on EPJ-1," and "Affidavit of M. C. Adams on EPJ-1" were served this 10th day of December, 1984 by deposit in the United States mail, first class, postage prepaid, to the parties on the attached Service List.

*Dale E. Hollar*

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Dated: December 10, 1984

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