

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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OFFICE OF SECRETARY  
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In the Matter of )

CAROLINA POWER AND LIGHT COMPANY AND )  
NORTH CAROLINA EASTERN MUNICIPAL )  
POWER AGENCY )

(Shearon Harris Nuclear Power Plant, )  
Units 1 and 2) )

Docket Nos. 50-400 OL  
50-401 OL

AFFIDAVIT OF THOMAS URBANIK II IN SUPPORT OF NRC STAFF RESPONSE  
TO APPLICANTS' MOTIONS FOR SUMMARY DISPOSITION OF  
EDDLEMAN CONTENTION 215(3), WILSON 12(b)(2), WILSON 12(b)(3) AND EPJ-2

I, Thomas Urbanik II, being duly sworn, depose and state:

1. I am Thomas Urbanik II, Associate Research Engineer and  
Program Manager, Texas Transportation Institute, Texas A&M University  
System, College Station, Texas.

2. I was a principal author of NUREG/CR-1745 "Analysis of  
Techniques for Estimating Evacuation Times for Emergency Planning Zones"  
(November 1980). I also provided input to the development of current  
guidance for evacuation time estimate studies which appear in Appendix 4  
to NUREG-0654, Revision 1, "Criteria for Preparation and Evaluation of  
Radiological Emergency Response Plans and Preparedness in Support of  
Nuclear Power Plants" (November, 1980). I have reviewed the initial  
evacuation time estimate study submittals of approximately 52 operating  
and near term nuclear facilities for the NRC in light of NUREG-0654, the  
results of which are published in NUREG/CR-1856 "An Analysis of Evacua-  
tion Time Estimates Around 52 Nuclear Power Plant Sites" (May, 1981).

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3. I am a subcontractor to Battelle Pacific Northwest Laboratories which is responsible under contract to the Nuclear Regulatory Commission for reviewing evacuation time estimate studies. A statement of my professional qualifications is attached.

4. I have reviewed the Applicant's evacuation time estimate study (Evacuation Time Estimates for the Plume Exposure Pathway Emergency Planning Zone - Shearon Harris Nuclear Power Plant, HMM Associates, October 1983) against the guidance of NUREG-0654/FEMA-REP-1, Revision 1. In conducting my review, I considered various elements set forth in Appendix 4 to NUREG-0654/FEMA-REP-1, Revision 1, which the NPC and FEMA believe should be included in evacuation time studies. These considerations include: (a) an accounting for permanent, transient, and special facility populations in the plume exposure EPZ; (b) an indication of the traffic analysis method and the method of arriving at road capacities; (c) consideration of a range of evacuation scenarios generally representative of normal through adverse evacuation conditions; (d) consideration of confirmation of evacuation; (e) identification of critical links and need for traffic control; and (f) use of methodology and traffic flow modeling techniques for various time estimates, consistent with the guidance of NUREG-0654/FEMA-REP-1, Revision 1, Appendix 4.

5. I have reviewed the Applicants Motion for Summary Disposition of Eddleman 215(3). Eddleman 215(3) states in pertinent part:

In violation of 10 C.F.R. 50.47(b) (10) CP&L's evacuation time study does not conform to NUREG-0654 Appendix 4 and will not provide accurate and useful guidelines for the choice of protective actions during an emergency because the study contains numerous so-called "conservatisms" including those referring to recreational populations and vehicle capacity factors (see e.g. sections 3-3 and 3-6) which may force evacuation time estimates upwards and provide

inaccurate estimates for decisionmakers during an emergency, in the opinion of expert Paul Holmbeck. Potential hazards of such "conservatism" are discussed in the 1984 Byron partial initial decision under emergency planning. [These conservatisms include:]

The apparent assumption that those households without vehicles will automatically evacuate with neighbors (or can) at the rate of one vehicle per household.

6. The evacuation time estimate study must account for all vehicles used in an evacuation including the vehicles used to transport persons in households without autos. The maximum number of vehicles required would result if every household without vehicles were transported in a taxi-type service (i.e. one vehicle per household). This is not the most realistic assumption given that some persons will likely be transported in buses (i.e., approximately 50 per vehicle), vans (i.e., approximately 8 per vehicle), or by other households. However, given the small number of households involved (410-655), the impact on the evacuation time estimate is not significant (i.e., 5 or 10 minutes). The resulting difference in time will not affect the usefulness of the time estimates to decisionmakers.

7. I have reviewed the Applicants Motion for Summary Disposition of Wilson 12(b)(2). Wilson 12(b)(2) states:

The evacuation time study itself is deficient because the 1 evacuating car/family assumption is too low -- many families would take 2 cars.

8. The assumption of 1 car per household is one of the alternatives suggested in NUREG-0654, Appendix 4 for estimating vehicle demand. It is also consistent with the assumption that families evacuate as a family unit (See Affidavit of Thomas Urbanik II on Eddleman 215(1)). The evacuation time study is, therefore, consistent with the guidance of NUREG-0654 Appendix 4, and with available data pertaining to evacuation of families.

9. I have reviewed the Applicants Motion for Summary Disposition of Wilson 12(b)(3) and EPJ-2. Wilson 12(b)(3) states:

The evacuation time study itself is deficient because: The 240 family [sic] without transportation is too low -- there are more without cars and many whose only car would be out of the EPZ at work. Many have cars that are not in working order.

EPJ-2 STATES:

Section IV.E.4.e of the State plan (at 47) is deficient because it provides no estimate of the number of people without transportation (Applicants' estimate of 240 families in evacuation time study (p. 3-2) seems far too low), no suggestions as to how people without transportation would get to pickup points, and no criteria for determining when and where they would be "established as required".

10. Wilson Contention 12(b)(3) and EPJ Contention 2 concern the correctness of the estimate of the number of households without transportation in the EPZ. The number of 240 given in the contentions apparently is the number for a portion of the EPZ. The number of transportation dependent households in the time estimate study (see p. 3-2) is 410, which is the number I considered in my review of the evacuation time estimate study. The Applicants Motion also includes updated data (see Affidavit of Kevin Twine) which indicates a total of 655 transportation dependent households in the EPZ. The Applicants' supplemental analysis also uses a different methodology than that employed in the original evacuation time estimate study. This methodology includes other factors, such as households having no car at home, and allows for persons being given rides by friends, neighbors, or relatives.

11. The original analysis was done based on the best available data and was consistent with NUREG-0654, Appendix 4. The revised analysis of the number of persons without autos used more recent data and different assumptions. The revised assumptions do not significantly affect the time estimate as the number of persons involved in either analysis is not significantly different.

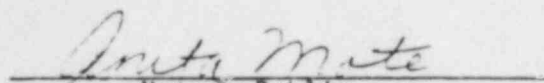
12. In regard to cars not being in working order, there is no known evidence of car availability being a problem based on a review of the the evacuation literature. Many families have more than one car and a variety of options exist for anyone have car problems and only one car, such as obtaining a ride from friends or relatives.

13. The evacuation time estimate study is, therefore, consistent with the guidance of NUREG-0654 and available data. No deficiencies exist and the revised analysis does not produce estimates of the transportation dependent population which would significantly affect the evacuation time estimates, and thus does not reduce the usefulness of the evacuation time estimate study.



Thomas Urbanik II

Sworn to and subscribed before me  
this 1<sup>st</sup> day of ~~January~~, 1985  
*March*

  
Notary Public

My Commission Expires: 4/188