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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

'84 OCT -1 P2:31

In the Matter of )

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

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

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Docket Nos. 50-400 OL  
50-401 OL

RESPONSE OF THOMAS URBANIK II ON BEHALF OF NRC STAFF  
TO SECOND ROUND INTERROGATORIES PROPOUNDED BY WELLS  
EDDLEMAN ON CONTENTIONS 215 AND 224

28. Is the single page consisting of checklist "Evaluation of Evacuation Time Estimate" (Shearon Harris) all the documentation (including handwritten notes, calculations, etc) that exists from Dr. Urbanik's review of Harris Evacuation Time Estimates (ETEs)? If not, please identify all such documents related to this review.

Yes.

29. Please identify authors and their addresses for all documents identified in response to first or second round interrogatories on 215 and 224.

Vehicle Occupancy: Report 6, 1977NPTS  
Richard Kuzmyak  
COMSIS Corporation  
11141 Georgia Avenue  
Wheaton, MD 20902

30. Where do the criteria for evaluation of ETEs used in Dr. Urbanik's review of the Harris ETEs come from? Please identify all documents containing such criteria.

NUREG 0654, Appendix 4, Revision 1

224-3. Are there any criteria for the kinds of severe weather conditions that should be applied to evacuation time estimates? If so, please identify all such criteria applicable to the Harris ETEs and all documents containing such criteria.

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224-4. Have you made any determination of the effect of weather conditions (a) analyzed in the ETEs (b) stated in contention 224 on the Harris ETEs, on any basis other than what the ETEs say? If so, what is your basis and what is your determination? Please identify all documents related to such determination.

No.

224-5. Are there any data sources describing how various kinds of adverse weather, including (a) rain (b) heavy rain (c) fog (d) freezing rain (e) snow (f) ice, affects (i) highway capacity (ii) highway capacity for curving two-lane roads such as exist in the Harris EPZ (iii) traffic speeds (iv) safe traffic speeds on curving two-lane roads such as are found in the Harris EPZ (v) traffic accident rates? Please identify all such data sources fully. If any were not used in your evaluation of the Harris ETEs then please state, for each such data source, all reasons why you did not use it in evaluating the Harris ETE.

Yes. The following data is the basis for my professional judgements concerning adverse weather. I know of no other definitive data.

NCHRP Report 95, Highway Fog by  
Kocman and Perchonok  
Cornell Aeronautical Laboratory  
Buffalo, NY  
1970

An Investigation into the Relationship between Rainfall and Road  
Accident Frequencies in Two Cities by Darisush Haghghi-Talab  
Department of Statistics and Computer Sciences  
University College London in  
"Accident Analysis and Prevention"  
Vo. 5, pp. 343-349.

Effect of Adverse Weather and Visibility on Capacity of a Signal-  
ized Intersection by  
P.K. Gandhi  
Technological Institute  
Northwestern University  
Evanston, Illinois  
November 1972

Effect of Rain on Freeway Capacity by E. Roy Jones and Merrell  
Goalsby  
Texas Transportation Institute  
College Station, Texas  
August 1969

215-10. Please explain all reasons for each check (X) mark made on the "Evaluation of Evacuation Time Estimate" for Shearon Harris. Please explain the criteria for "adequate" on each item in the evaluation.

An (X) mark indicates the item is consistent with the guidance of NUREG 0654, Appendix 4. Items are not adequate if they are not addressed or if they are handled in an incomplete or inconsistent manner.

- 215-11. Do the evaluation criteria for the ETEs ensure that an ETE evaluated as "adequate" is not inaccurate due to conservatisms in the assumptions used in the ETE? If so, how (explain in as much detail as you know, please)? If not, why not?

The evaluation criteria assure compliance with the guidance. Conservatisms are not a part of the ETE process as the aim is the best possible estimate. Neither an overly long nor an overly short estimate is conservative.

- 215-12. Which assumptions, if any, in the Harris ETEs, do you consider "conservative"? For each, please explain why you consider it "conservative" and how each such assumption affects the ETEs. Please identify all documents which contain information which in your opinion tends to show, or shows, that any assumption in the Harris ETEs is conservative. Please state which assumptions relate to which documents, and for each assumption, state the qualitative (or quantitative, if known) effect on evacuation time for the Harris EPZ that results from that assumption.

As previously stated, the concept of conservatism is not appropriate to evacuation time estimates.

- 215-13. Do you believe that every assumption made in the Harris ETEs is accurate? If not, which are inaccurate (please list)? Please identify all documents and information which supports your belief regarding the accuracy (or inaccuracy) of each assumption in the Harris ETEs.

The Harris assumptions are consistent with the guidance. They are, therefore, accurate in their conformity to the guidance of NUREG 0654, Appendix 4.

- 215-14. Which assumptions in the Harris ETEs have you evaluated (please list)? Of these, which did you evaluate for accuracy (please check off on list, or list separately)? Of what, other than evaluating accuracy, did your evaluation of assumptions in the Harris ETEs consist? What did you specifically do in evaluating the assumptions in the Harris ETEs?

All assumptions listed in Chapter 2 of the Harris ETE are accurate in their conformity to NUREG 0654, Appendix 4.

- 215-15. How much variability can there be, in your opinion, between each estimate of evacuation time in the Harris ETEs, and the actual time evacuation could take if it were ordered (a) under the same conditions the ETEs estimated the time for? (b) under other conditions not included in ETE assumptions? Please give all reasons for your answers and identify all documents of analysis supporting each part of each answer. (c) Could evacuation take (i) less (ii) more time than the Harris ETEs say, depending on the accuracy of assumptions in the ETEs? Please identify all documents which you believe support your answers.

The evacuation time estimate is by definition an estimate and based on my judgement should be considered to have range of plus or minus 10 to 20 percent. An actual evacuation could take more or less time. My opinion is based on experience with evacuation time estimates developed by a variety of professionals.

- 215-16. Has there ever been any test of fullscale evacuation of a nuclear power plant EPZ of about 10 miles radius? If so, how long did it take? Please identify all documents concerning it, and how the evacuation time (actual) compared with any estimates of the evacuation time made before evacuation.

I am not aware of any tests or full scale evacuations.

- 215-17. Have models of evacuation such as NETVAC been applied to non-nuclear evacuation time estimates? If so, have any actual evacuations occurred for which NETVAC-based estimates exist? Please identify all documents concerning application of NETVAC or other similar evacuation time estimating models, and all documents concerning actual evacuations (and the times they took and/or the estimated evacuation times for them), for such non-nuclear evacuations.

I am not aware of any actual evacuations that have been modeled either before or after an evacuation.

- 215-18. Have there been any other tests of any kind of the accuracy of the NETVAC model or estimates based on it, for (i) nuclear plant-related evacuations from EPZs (ii) other evacuations? Please identify all documents concerning such evacuations and/or tests or the results of such tests, particularly results concerning the accuracy of the NETVAC model. If there were any assumptions introduced into the NETVAC model that adversely affected its accuracy for any such evacuation(s) or test(s), please identify each assumption.

HMM Associates has done some limited validations at Seabrook. I do not believe any changes or modifications have been made to the model, nor have any problems been identified.

215-19. Do you know anything about the accuracy of assumptions in the Harris ETEs which you have not stated in response to above interrogatories? If so, what do you know and what assumptions or assumption does (do) it relate to? Please identify all documents supporting, related to, or forming the basis or part of the basis, for your answer for each assumption.

No.



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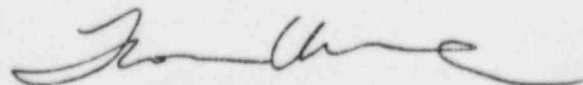
(Shearon Harris Nuclear Power Plant, )  
Units 1 and 2 )

Docket No. 50-400 OL  
50-401 OL

AFFIDAVIT OF THOMAS URBANIK II

I, Thomas Urbanik II, hereby affirm as follows, subject to the penalty of perjury, that the answers are true and correct to my best knowledge and belief.

1. I am an Associate Research Engineer associated with the Texas Transportation Institute of the Texas A&M University System, College Station, Texas.
2. I hereby certify the answers given to Second Round Interrogatories on Eddleman 215 and 224 are true to the best of my knowledge.



\_\_\_\_\_  
Thomas Urbanik II



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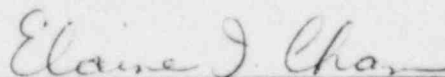
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