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RELATED CORRESPONDENCE

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 O.L. 10 A11:19

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USNRC

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DOCKETING SECTION
MAR 10 1974

APPLICANTS' RESPONSE TO WELLS EDDLEMAN'S
GENERAL INTERROGATORIES TO APPLICANTS (Tenth Set)

Applicants Carolina Power & Light Company ("CP&L") and North Carolina Eastern Municipal Power Agency, pursuant to 10 C.F.R. § 2.740b, hereby submit the following responses to "Wells Eddleman's General Interrogatories to Applicants Carolina Power & Light et al. (10th Set)." The provision of answers to these interrogatories is not to be deemed a representation that Applicants consider the information sought to be relevant to the issues to be heard in this proceeding.

GENERAL INTERROGATORIES

INTERROGATORY NO. G1(a). Which contentions of Wells Eddleman do Applicants agree are now admitted in this proceeding, NRC Dockets 50-400/401 O.L.?

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ANSWER: The contentions of Intervenor Eddleman which are admitted to this proceeding are set forth in various memoranda and orders issued by the Atomic Safety and Licensing Board, all of which are available to Mr. Eddleman.

INTERROGATORY NO. G1(b). [F]or each such contention, provide for any answers to interrogatories by Wells Eddleman which Applicants have previously or presently received (except those suspended by Board order, if any), the following information:

ANSWER: The answers to General Interrogatories herein are restricted to Eddleman Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 and 224.

INTERROGATORY NO. G1(c). Please state the name, present or last known address, and present or last known employer of each person whom Applicants believe or know (1) has first-hand knowledge of the facts alleged in each such answer; or (2) upon whom Applicants relied (other than their attorneys) in making such answer.

ANSWER: The following list identifies those persons who provided information upon which Applicants relied in answering the interrogatories on Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 and 224 and indicates the particular interrogatory answers for which such person provided information:

<u>PERSON</u>	<u>INTERROGATORY NO.</u>
Jesse T. Pugh, III Division of Emergency Management N.C. Dept. of Crime Control and Public Safety 7(b), (e), Raleigh, N.C. 27611	57-C-3-3(a), 57-C-3-4(a), (b), (c), 57-C-3-5(1), (m), 57-C-3-6, 57-C-3- 57-C-3-8, 57-C-3-9, 213-3, 213-4, 57-C-10-5, 57-C-10-6, 57-C-10-7, 57-C-10-8(a), (b), (d), 57-C-10-9, 57-C-10-10, 57-C-10-11, 57-C-13-3,

	57-C-13-4, 224-3(d)-(e), 215-10
Charles D. Reed Adult Health Services Section Division of Health Services N.C. Dept. of Human Resources P.O. Box 2091 Raleigh, N.C. 27602	30-3 30-4 30-5 30-6
Robert D. Klimm HMM Associates, Inc. 336 Baker Avenue Concord, Mass. 01742	57-C-3-3(d), (e), (f), 57-C-3-4(f), (g), (h), 57-C-3-5(a) through (k), 224-4, 224-5, 215-10, 215-11, 215-12, 215-13(a), (b), (c), 215-14(a), (c) through (l)
Reada Bassiouri Acoustic Technology, Inc. 22 Union Wharf Boston, Mass. 02109	57-C-3-3(b), (c)
Carolyn Anderson Carolina Power & Light Co. Shearon Harris Energy & Environmental Center Route 1, Box 327 New Hill, N.C. 27562	215-13(d), 215-14(b)
Robert Black Carolina Power & Light Company 7(a), (c), (d), (f), (g), P.O. Box 1551 8(c), (e), (f), (g), Raleigh, N.C. 27602	57-C-3-4(d), (e), 57-C-3- 57-C-10- 224-3(d)-(e)
Brian McFeaters Carolina Power & Light Company P.O. Box 1551 Raleigh, N.C. 27602	57-C-5(j)-(k) 224-3(a), (b), (c)

INTERROGATORY NO. G1(d). [P]lease identify all facts concerning which each such person identified in response to G1(c)(1) above has first-hand knowledge.

ANSWER: See answer to Interrogatory No. G1(c).

INTERROGATORY NO. G1(e). [P]lease identify all facts and/or documents upon which each person identified in response to G1(c)(2) above relied in providing information to respond to the interrogatory, including the parts of such documents relied upon.

ANSWER: All facts or documents relied upon by those individuals identified above are indicated within each response to the specific interrogatories on Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 and 224.

INTERROGATORY NO. G1(f). Please identify any other document(s) used or relied upon by Applicants in responding to the interrogatory.

ANSWER: See Answer G1(e).

INTERROGATORY G1(g). Please state which specific fact each document, identified in response to G1(e) and G1(f) above, supports, in the opinion or belief of Applicants, or which Applicants allege such document supports.

ANSWER: Applicants have indicated which specific facts are supported by the documents identified, within each response to the specific interrogatories on Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 and 224.

INTERROGATORY G1(h). Please state specifically what information each person identified in response to G1(c)(1) or G1(c)(2) above provided to or for Applicants' affiant in answering the interrogatory. If any of this information is not documented, please identify it as "undocumented" in responding to this section of General Interrogatory G1.

ANSWER: See Answer G1(c).

INTERROGATORY G2(a). Please state the name, present or last known address, title (if any), and present or last known employer, and economic interest (shareholder, bondholder, contractor, employee, etc.) if any (beyond expert or other witness fees) such person holds in Applicants or any of them, for each person you intend or expect to call as an expert witness or a witness in this proceeding, if such information has not previously been supplied, or has changed since such information was last supplied, to Wells Eddleman. This applies to Eddleman and Joint Contentions as admitted, or stipulated by Applicants.

ANSWER: Applicants have not yet identified the expert or other witnesses they expect to call in this proceeding regarding these Eddleman contentions. When and if such witnesses are identified, Applicants will supplement this response in a timely manner.

INTERROGATORY NO. G2(b). Please identify each contention regarding which each such person is expected to testify.

ANSWER: See Answer G2(a).

INTERROGATORY NO. G2(c). Please state when you first contacted each such person with regard to the possibility of such person's testifying for Applicants, if you have contacted such person.

ANSWER: See Answer G2(a).

INTERROGATORY NO. G2(d). Please state the subject matter, separately for each contention as to which each such person is expected to testify, which each such person is expected to testify to.

ANSWER: See Answer G2(a).

INTERROGATORY NO. G2(e). Please identify all documents or parts thereof upon which each such witness is expected to, plans to, or will rely, in testifying or in preparing testimony.

ANSWER: See Answer G2(a).

INTERROGATORY NO. G3(a). Please identify any other source(s) of information which Applicants have used to respond to any interrogatory identified under G1 above, stating for each such source the interrogatory to which it relates, and what information it provides, and identifying where in such source that information is to be found.

ANSWER: Applicants have identified all other such sources of information, if any, within the answers to the specific interrogatories set forth herein.

INTERROGATORY NO. G3(b). Please identify any other source(s) of information not previously identified upon which any witness identified under G2 above, or other witness, has used in preparing testimony or exhibits, or expects to use in testimony or exhibits, identifying for each such source the witness who is expected to use it, and the part or part(s) of such source (if applicable) which are expected to be used, and, if not previously stated, the fact(s) or subject matter (or both) to which such source relates.

ANSWER: See Answer G2(a).

INTERROGATORY NO. G4(a). [P]lease identify all documents, and which pages or sections thereof Applicants intend or expect to use in cross-examination of any witness I call in this hearing. For each such witness, please provide on a timely basis (ASAP near or during hearings) a list of all such documents, the subject matter Applicants believe they relate to, and make the document(s) available for inspection and copying as soon as possible after Applicants decide or form intent to use such document in cross-examination.

ANSWER: Applicants have not at this time identified which documents, if any, they intend to use in cross-examination of Mr. Eddleman's witnesses.

INTERROGATORY NO. G4(b). [P]lease identify any undocumented information Applicants intend to use in cross-examination of each such witness for me.

ANSWER: See Answer G4(a).

INTERROGATORY NO. G5(a). [F]or each contention Applicants state or admit is an admitted Eddleman contention under G1(a) above, or an admitted joint intervenor contention, please state whether applicants have available to them experts, and information, on the subject matter of the contention.

ANSWER: Applicants have available to them experts and information on the subject matter of Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 and 224.

INTERROGATORY NO. G5(b). If the answer to (a) above is other than affirmative, state whether Applicants expect to be able to obtain expertise in the subject matter, and information on it, and if not, why not.

ANSWER: Not applicable.

INTERROGATORY NO. G6(a). [F]or each document identified in response to any interrogatory herein, or referenced in response to any interrogatory herein, please supply all the following information which has not already been supplied:

- (i) date of the document
- (ii) title or identification of document
- (iii) all authors of the document, or the author
- (iv) all qualifications (professional, technical) of each author of the document
- (v) the specific parts, sections or pages, of the document, if any, upon which Applicants rely
- (vi) the specific information each part, section or page identified in response to (v) above contains.
- (vii) identify all documents used in preparing the document to the extent known (and also to the extent not identified in the document itself)
- (viii) state whether Applicants or State of NC or any emergency planner possess a copy of the document
- (ix) state all expert opinions contained in the document, upon which Applicants rely, or identify each such opinion.
- (x) identify the contention(s) with respect to which Applicants rely upon (a) the expert opinions (b) the facts identified in the document
- (xi) state whether Applicants now employ any author(s) of the document, identifying each person for each document.
- (xii) state whether Applicants have ever employed any author(s) of the document, identifying each such person for each document.
- (xiii) identify all sources of data used in the document.

Answers to all the above may be tabulated or grouped for efficiency.

ANSWER: All such information available to the Applicants with regard to each document identified in response to an interrogatory herein is contained in the particular document which is being made available to Mr. Eddleman. It would be particularly burdensome for Applicants to research all historical employment records to determine whether the authors of each document identified herein have ever been employed by Applicants. However, Applicants will supplement this response in a timely manner if and when Mr. Eddleman identifies any such author regarding whom he is particularly interested in determining this information.

INTERROGATORY NO. G7(a). Please identify all documents which Applicants plan, expect or intend to offer as exhibits (other than for cross-examination) with respect to each Eddleman contention admitted in this proceeding which (i) is included in your current response to G1(a), or (ii) is the subject of interrogatories in this set; please state for which contention or contentions each exhibit will be or is expected to be offered.

ANSWER: Applicants have not yet identified those documents they intend to offer as exhibits relating to Contentions 30, 57-C-3, 57-C-10, 57-C-13, 213, 215 or 224

INTERROGATORY NO. G7(b). Please identify all documents which Applicants plan, expect or intend to use in cross-examination of any other parties' witnesses or joint intervenor witness in this proceeding, with respect to (i) Eddleman contentions identified under G7(a)(i) (or G1(a)) above, or any other Eddleman contention which is the subject of interrogatories in this set; (ii) each Joint contention now admitted in this proceeding; (iii) per our agreement of 4-8-83, each contention of each other party to this proceeding which is currently admitted. Please identify for each such document the witnesses, or witness, and all contentions with respect to whom (or which) that document is planned, expected, or intended to be offered or used.

ANSWER: Applicants have not yet identified those documents they intend to use for cross-examination of any witness.

INTERROGATORY NO. G7(c). Please identify which of the documents identified in response to (b) above (i) will be offered into evidence by Applicants, and (ii) which of the same documents Applicants expect to offer into evidence or intend to offer as evidence or exhibits in this proceeding.

ANSWER: See Answer G7(b).

INTERROGATORY NO. G10(a). Where the above general interrogatories and/or specific interrogatories below, or any of them, call for identification of documents, (i) and no documents are identified, is that the same as Applicants stating that there are no documents responsive to this general interrogatory, in each case where no documents are identified? (ii) and documents are identified, is that the same as Applicants stating that the identified documents are the only ones presently known which are responsive to the interrogatories? (iii) If your answer to G10(a)(ii) is other than affirmative, please state all reasons for your answer. (iv) If your answer to G10(a)(i) above is other than affirmative, please state all reasons for your answer.

ANSWER: (i) Yes.
(ii) Yes.
(iii) Not applicable.
(iv) Not applicable.

INTERROGATORY NO. G10(b). Where any interrogatory, general or specific, herein, calls for factual information (i) and an opinion is stated in response, is that the expert opinion of any person(s) identified as having contributed information to that response? (ii) and facts are given or identified (or a fact is) in response, but no documents are identified, does that mean Applicants have no documents containing such fact(s)? (iii) If your answer to (i) above is affirmative, please state for each such response all qualifications of each expert upon whom Applicants rely for each such answer. The qualifications need be stated only once for each such person if they are clearly referenced in other answers. (iv) if your answer to (i) above is other than affirmative, please state which opinions, if any, given in response to interrogatories (general or specific) herein is the opinion of an expert, identify each expert whose opinion you used in response to each interrogatory, and state in full the qualifications of each such expert. (v) If your answer to (i) above is other than affirmative,

please identify all opinions of non-experts used in your responses, and identify each non-expert whose opinion is included in each answer herein. (vi) If your response to (ii) above is other than affirmative, please identify each document which contains a fact not previously documentd in your response(s), stating what the fact is, and at what page, place, chapter or other specific part the document contains such fact.

- ANSWER: (i) Yes.
- (ii) See Answers G1(e), (f) and (g) and G10(a)(i) above.
- (iii) The professional qualifications of Messrs. Bassiouni, Black and McFeaters are being provided under separate cover. All others have been previously provided.
- (iv) Not applicable.
- (v) Not applicable.
- (vi) Not applicable.

INTERROGATORY NO. G11. For each answer to each interrogatory herein (or any subpart or part thereof), please identify each item of information in possession of Applicants (including facts, opinions of experts, and documents) which (a) contradicts the answer you made, (i) in whole (ii) in part (please identify each such part for each item of information identified), (b) casts doubt on your answer (i) in whole (ii) in part (please identify each such part for each item of information identified). (c) Please identify all documents not already identified in response to parts (a) and (b) above (and their subparts) which contains any item of information asked for in (a) or (b) above. Please identify for each such document what information item(s) it contains and what answer(s) each such item is related to.

ANSWER: G11(a)-(c): Applicants have no such information.

INTERROGATORY NO. G-12(a): In your previous answers where you have not identified documents, (i) have all relevant documents been produced in lieu of stating identification of each such document? (ii) do you rely on the entire document, since you have not identified parts or page numbers? (iii) if there

are any particular parts or pages of each document produced, which you believe are responsive to an interrogatory or portion thereof, please identify each set of parts or pages in each document, together with the interrogatory or portion thereof (or interrogatories and/or portions thereof) to which it is responsive. (iv) where no documents are identified and identification of documents has been requested, are you saying no such documents exist? Or that no such documents are in your possession? (b) In your present answers, are you actually identifying documents where identification of documents is requested? (c) If not, how are you going to provide identification of documents? Will that identification include statements of relevant pages or parts?

ANSWER: G12(a)-(c): All responsive documents have been either identified in or produced in response to the discovery requests. Page numbers have been specified in each case where Applicants rely on specific portions of a document and can identify those portions more readily than could someone who has no familiarity with the document. Where identification of documents has been requested, and none are identified, Applicants know of no responsive documents.

INTERROGATORIES ON EDDLEMAN 57-C-3

INTERROGATORY NO. 57-C-3-3(a): Is any consideration of temperature given in night-time notification of residents or transients within the EPZ (i) at all (ii) as regard turning off heating devices on cold nights, if sheltering is recommended (iii) as regards turning off air conditioners on warm or hot nights, if sheltering is recommended?

(b) Have you (i) conducted any tests (ii) collected any information (iii) known any information, concerning the ability of each notification method you will use for Harris accidents at night, especially between 1 am and 6 am, to awaken persons with the EPZ?

(c) If so, please identify all such information and all documents containing such information.

(d) Does the emergency planning account for any delay in sleeping persons (asleep at the time of notification) receiving the information that a Harris accident is in progress?

(e) If so, please explain all such sources of delay (e.g. delay due to awakening, delay due to sleepiness, grogginess or drowsiness, delay in preparing to evacuate, delay in travel due to tired or sleepy drivers, etc) and how each or any of them is taken into account in the planning for emergency conditions (nuclear accidents) at the Harris nuclear plant.

(f) Please identify all documents concerning the matters inquired about in parts (a), (d), or (e) (or any subparts) above, which have not been previously identified, stating for each such document what specific interrogatory part(s) or subpart(s) it relates to.

ANSWER: (a) Temperature is not considered in notification. However, if sheltering is determined to be the appropriate protective action, instructions for the public are included in Annex D to the North Carolina Emergency Response Plan in support of the Shearon Harris Nuclear Power Plant.

(b) Applicants have not conducted tests and have not collected information specific to the capabilities of different notification methods at night. NUREG-0654 was utilized as guidance in designing the notification system within the Harris EPZ. It has been demonstrated that nighttime ambient background noise is substantially lower than daytime, which facilitates the effectiveness of notification by siren at night.

(c) NUREG-0654, "Criteria For Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness In Support of Nuclear Power Plants" (Rev. 1, Nov. 1980); FEMA-43, "Standard Guide For Evaluation of Alert and Notification Systems For Nuclear Power Plants" (Sept. 1983); and Beranek, Leo, "Noise & Vibration Control" (McGraw-Hill), at 579, Figure 18-8.

(d) The same notification procedures will be followed at night as during the day. However, the evacuation time estimates (ETE) implicitly provide for delays associated with awakening sleeping residents of the EPZ, by assuming a delayed and staggered departure from the EPZ. The ETE assumes that no one leaves until half an hour after the decision to evacuate has been made and that the subsequent departures are distributed over the next two hours. This is considered to adequately account for any delays of the type cited.

(e) See response to (d).

(f) Not applicable.

INTERROGATORY NO. 57-C-3-4(a): Referring to your answer to 57-C-3-2, do any of the entities listed (including "other authorities") have any automatic telephone notification or dialing systems at all?

(b) If so, please answer 57-C-3-2(b) with respect to the capabilities of each such system.

(c) Do you have any opinion as to whether persons awakened by sirens in the Harris EPZ might use the telephone (i) to ask authorities what is going on (ii) to notify friends or relatives or others of the accident (iii) for other reasons? (iv) which, if any, of your opinions expressed re the questions (i), (ii) or (iii) above, would change if the awakening occurs during normal sleeping hours, e.g. from 1 am to 6 am? Please detail how each such opinion would change if the awakening occurred during people's normal sleeping hours.

(d) Do you have any information concerning the response of persons to (i) siren (ii) telephone (iii) broadcast (iv) loudspeaker/sound truck (v) personal contact (e.g. door-knocking) notification of severe accidents where evacuation or sheltering may be necessary?

(e) Please identify all information you have concerning the matters asked about in (d) above, telling for each what documents if any contain the information, and what subpart(s) the information relates to.

(f) Is it your opinion that evacuation of the Harris EPZ could occur as rapidly during normal sleeping hours (e.g. between 1 am and 6 am) as it could during daytime hours, all weather or other conditions being equal? Please state all reasons and information supporting your opinion.

(g) Is it your opinion that evacuation of the Harris EPZ could occur as rapidly during normal sleeping hours (1 am to 6 am) as it could under evening conditions, all weather or other conditions being equal? Please state all reasons and information supporting your opinion.

(h) Is it your opinion that evacuation of the Harris EPZ would be more or less rapid during normal sleeping hours (1 am to 6 am) as it would be under (i) daytime conditions, similar weather (ii) evening conditions, up to about 10 pm, with similar weather? Please state all reasons and information supporting your opinion. Please identify all documents which contain information re answers to parts (f) (g) and (h) (including all sub-parts).

ANSWER: (a) None of the entities listed have available to them automatic telephone notification or dialing systems for notification of the general public.

(b) Not applicable.

(c) Some people would probably try to use the telephone for the specified reasons at all times of the day or night.

(d) Information concerning the response of persons to various means of notification is available in the public literature.

(e) Such information is discussed in the following documents:

Susan Cutter and Kent Barnes. Evacuation Behavior and Three-Mile Island. Disasters, Volume 6, No. 2, pp. 116-124 (1982).

Ronald W. Perry et al. Evacuation Planning in Emergency Management. Lexington Books, D.C. Heath and Company, Lexington, Massachusetts (1981).

Ronald W. Perry. Comprehensive Emergency Management: Evacuating Threatened Populations, JAI Books, Greenwich, Connecticut (1983).

(f) Yes. See response to Interrogatory No. 57-C-3-5(d).

An evacuation of the Harris EPZ can be expected to occur as rapidly during normal sleeping hours as during daytime hours all other conditions being equal. This is the case since potential delays associated with waking and mobilizing a sleeping population are offset by other factors. For instance forming family units is much simpler during normal sleeping hours. This minimizes time required to prepare to evacuate. Likewise, demands for public emergency vehicles will be reduced since permanent resident vehicles will be at the residence when notification is received in a greater number of cases during sleeping hours. In addition, there is likely to be much less cross-traffic during sleeping hours since the highway network will be nearly empty. All of these factors will serve to enhance evacuation capabilities.

(g) Yes. See response to Interrogatory No. 57-C-3-5(d), and the reasons outlined in the previous response.

(h) There would be no significant difference in the amount of time to evacuate in sleeping hours versus non-sleeping hours for the reasons previously cited. As

indicated in the ETE report, an evacuation during the day is estimated to take longer. The longer period of time is required due to the higher employment and transient populations during the day. The ETE explains, in detail, the methodology, data and assumptions used in each of the scenarios modelled.

See also the response to Interrogatory No. 57-C-3-5(d).

INTERROGATORY NO. 57-C-3-5(a): Is there any difference in rapidity of evacuation during normal sleeping hours (e.g. 1 am to 6 am) as compared to evacuation at other times?

(b) [P]lease explain each such difference.

(c) [A]re there differences in evacuation conditions during normal sleeping hours, and conditions for evacuation during other hours, that would tend to offset or cancel each other?

(d) [W]hat are these differences, and how do they act to offset each other?

(e) Please identify all documents concerning differences in (i) evacuation conditions (ii) rapidity of evacuation (iii) evacuation times, for normal sleeping hours compared to other times.

(f) [A]re there any differences in evacuation conditions (see (c) above, e.g.) between sleeping hours (1 am - 6 am) and other hours which would affect or could affect evacuation times?

(g) What are these differences and how does (or could) each affect evacuation times?

(h) Is there any actual experience with night-time evacuations which indicates differences in evacuation times under sleeping hours conditions?

(j) Is there any consideration of increased likelihood of fog or precipitation during normal sleeping hours (1 am to 6 am) in the emergency planning for the Harris nuclear plant?

(k) If so, what consideration, and how does it affect evacuation time estimates? What amount of increase or decrease in the evacuation times due to these conditions is possible? Why? Why not more? Why not less?

(l) Does the State of NC, CP&L or any other responsible emergency preparedness agency intend to test (i) communications (ii) notification (iii) sheltering (iv) evacuation (v) other emergency response plan elements, during normal sleeping hours (1 am to 6 am or any time between these hours, i.e. between 1 am to 6 am)?

(m) If so, what tests will be done, by whom, and on about what dates (e.g. before fullscale plan test, during that test, before Jan. 1, 1985, quarterly, once a year, etc)?

ANSWER: (a) There may be a difference, for the reasons outlined in the response to (d) below.

(b) See the response to (d) below.

(c) Yes.

(d) At night, there is less existing traffic on the roads. Family members are more likely to be all together and evacuate as units, thus minimizing the number of evacuating vehicles. These factors would tend to make evacuation more rapid at night than during the day. On the other hand, driving at night may be more difficult for some people. See also the response to 57-C-3-4(f).

A study of past evacuations by the U.S. Environmental Protection Agency, Joseph M. Hans, Jr. and Thomas C. Sell, Evacuation Risks -- An Evaluation, EPA-520/6-74-002 (June 1974), did not reveal any correlation between time of day and the time required to evacuate a population group.

(e) See response to (d) above.

(f) Yes.

(g) See response to (d) above.

(h) Yes. See response to (e) above.

(j) - (k) The adverse weather case analyzed in the ETE is a late fall weekday case. This case combines peak populations with a roadway capacity reduction of 25%. This adverse case is considered more time consuming than an adverse weather case during normal sleeping hours.

No specific analysis of the frequency of fog or precipitation during sleeping hours has been attempted. However, it should be noted that precipitation in the vicinity of the Harris plant site is not more likely during normal sleeping hours than at other times of the day or night.

(l) As required in Part II, Section N, of NUREG-0654, Revision 1 (November 1980), periodic exercises will be conducted to evaluate major portions of emergency response capabilities, and periodic drills will be conducted to develop and maintain key skills. The type and frequency of drills and exercises, and the responsibility for their conduct, are described in 44 C.F.R. Part 350 and Section VII of the North Carolina Emergency Response Plan In Support of SHNPP. This plan has been served on the parties to this proceeding. As indicated there, at least one exercise will begin between midnight and 6 a.m. every six years.

(m) See response to (l) above.

INTERROGATORY NO. 57-C-3-6(a): Does NUREG-0654, FEMA 43, or other applicable guidance (please identify all documents containing other applicable guidance) for the Harris offsite emergency plan require (i) both an alert signal and an informational or instructional message to the population on an area

wide basis throughout the 10 mile EPZ, within 15 minutes? (ii) initial notification system assuring direct coverage of essentially 100% of the population within 5 miles of the site? (iii) special arrangements to assure 100% coverage within 45 minutes of the population who may not have received the initial notification within the entire plume exposure EPZ?

(b) How does the Harris offsite emergency plan notification procedure meet each notification requirement of FEMA 43 (Including (i), (ii) and (iii) of (a) above if applicable) during normal sleeping hours (e.g. 1 am to 6 am)? Please specify your answer in detail, describing the alerting systems used, the design report on each alerting means to be used, the ability to provide an informational or instructional message to persons who are asleep at the time of the alert/notification beginning; please specify all documents, opinions of experts, or other information you rely on in making your answer. Please answer separately for each requirement or criterion for notification in NUREG-0654 or FEMA 43, or other applicable guidance (as indicated in your answer to (a) above).

ANSWER: (a) The minimum acceptable design objectives for an alert and notification system are specified in Appendix 3 of NUREG-0654, Revision 1 (November 1980). Item (i) is one of the three design objectives for the system. This design objective is also specified in 10 C.F.R. Part 50, Appendix E, IV, D.3, which indicates that the timing and extent of actuation of the public notification system is a responsibility of State and local officials. Items (ii) and (iii) above are the two other design objectives specified in NUREG-0654. These three design objectives are also quoted in FEMA-43 (September 1983).

(b) The same way it does during daytime. A study by the Applicants to demonstrate that the Harris alert and notification system meets the criteria in FEMA-43 is now in progress.

INTERROGATORY NO. 57-C-3-7(a): What, in your view, are the merits and/or negative aspects of the use of tone alert radios to notify sleeping persons of an accident at the Harris plant?

(b) Isn't it true that FEMA 43 section E.6.2.4 that tone alert radios are one of the methods of alerting not included in "special alerting methods"?

(c) Have you made any investigation as to the cost, effectiveness, or other aspects of tone alert radios for the Harris EPZ?

(d) Please provide details of any investigation re tone alert radios that you have made, either for the Harris EPZ, or otherwise, identifying all documents containing information about the scope, plan, authorization, method of inquiry, results, or information obtained or developed in such investigation.

(e) Are there any other sources of information re tone alert radios which you are aware of? Please identify each such.

(f) Do you consider tone alert radios to be an alternative to (i) siren notification (ii) loudspeaker notification (iii) automatic ringdown telephone notification, for notification of Harris plant emergencies and/or providing informational or instructional messages to persons within the Harris plume exposure EPZ, during normal sleeping hours, e.g. 1 am to 6 am?

(g) Please give all reasons for your answer(s) to each subpart of (f) above.

ANSWER: (a) The merits are (i) it will meet the 15 minute guideline of NUREG-0654, Appendix 3; and (ii) the message is given at the same time as the alert. The principal drawback is the lack of physical control over the radios by emergency response authorities regarding their use, testing, maintenance, and repair. An additional drawback is that people may not hear the tone alert radios if they are in another part of the house or outside.

(b) As indicated in the first paragraph of Section E.6.2.4 of FEMA-43, the section deals with alerting methods other than sirens, mobile siren vehicles, or tone alert radios.

(c) No formal study for the Harris EPZ was conducted; however, CP&L has studied this matter for other plants. See response to (d) below.

(d) Applicants included analysis of tone alert radio notification systems in the development of emergency notification systems for CP&L's Brunswick and Robinson Nuclear Plants. The results of this analysis are included in studies prepared by NUTECH Corporation, dated December 1980, which are available upon request. Applicants, in their evaluation of these studies, selected a siren notification system because of its reliability, ease of maintenance and testing, cost effectiveness, regulatory requirements, effectiveness in notification capability, and the capability to physically control the warning devices.

(e) Federal Emergency Management Agency. Standard Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants, FEMA-43 (September 1983).

(f) Tone alert radios could supplement all of those systems.

(g) See the response to (a) above as well as the reference listed in the response to (e) above.

INTERROGATORY NO. 57-C-3-8(a): Does FEMA encourage the use or development of special alerting methods such as automatic telephone dialers or switching equipment where it is cost effective?

(b) Please provide all basis for your answer to (a), identifying all documents or expert opinions you used in making that answer.

(c) Have you made any study of the cost-effectiveness of any special alerting methods for the Harris EPZ during normal sleeping hours (e.g. 1 am to 6 am)?

(d) Please identify all documents concerning, or used in, or identified during, any such study as inquired about in part (c) above.

(e) Have you made any study of simultaneous dialing systems, e.g. those mentioned in section E.6.2.4.4 of FEMA 43, for use in the Harris EPZ, for notification during normal sleeping hours or for notification or delivery of instructional or informational messages?

(f) Please provide details of any such study as inquired about in part (e) above, including identification of all documents related to such study, particularly any about the capability of simultaneous-dialing or simultaneous-ringing telephone equipment.

(g) Was the message-delivering capability of simultaneous-ringing or dialing telephone equipment considered in any of your studies? In which, and how?

(h) What is your opinion concerning the usefulness of (i) simultaneous dialing (ii) automatic ringdown dialing telephone equipment for notification of persons within the Harris EPZ during normal sleeping hours? Please give all basis for your opinion, identifying all documents used in preparing or supporting your opinion.

(j) (there is no part (i) since that is used for subparts, as (i), (ii)) What role did provisions for (i) calling back busy lines (ii) preventing subscriber overloading of the telephone system during use of telephone notification to Harris EPZ residents/transients play in your analysis or study of telephone notification within the Harris EPZ?

(k) Would telephone system overloading by subscribers be less, more of, or about the same of a problem for telephone notification during normal sleeping hours?

(l) Have you made, or collected, any other studies or reports or inquiries concerning notification systems or methods for people (i) who are asleep at the time of notification (ii) whose whole households are asleep at the time of notification, for emergency planning/response purposes or other purposes?

(m) Please describe in detail any studies/information asked about in (l) above.

ANSWER: (a) Yes.

(b) FEMA-43, Section E.6.2.4.

(c) No.

(d) Not applicable.

(e) No; no formal studies have been conducted.

(f) Not applicable.

(g) No studies were conducted (see response to (e) above).

(h) Both can be useful in warning a relatively small population or emergency response authorities. The drawback is that they can burden the available telephone network, which may be needed for other purposes.

(j) Not applicable.

(k) Fewer people would probably be using the phone system during normal sleeping hours than during the day.

(l) No.

(m) Not applicable.

INTERROGATORY NO. 57-C-3-9(a): Referring to your answer to 57-C-3-1(f), if not previously fully answered, does any documentation or records of any kind concerning the consideration of telephone notification of persons within the EPZ that was made during the Harris emergency planning process exist?

(b) If so, what documentation? Please identify it fully; please fully identify any other records of this consideration which you know of.

(c) If answer to (a) is "none" or an answer to that effect, or you believe you have fully answered (a) previously, please explain why no records of this consideration exist.

(d) Do you remember anything about the consideration of telephone notification of persons within the EPZ that was made during the emergency planning process?

(e) If so, what do you remember? (i) Do you remember what kinds of telephone notification (aa) methods (bb) systems, were considered? (ii) do you remember any reasons why telephone notification was rejected? (iii) do you remember whether night-time (normal sleeping hours) notification was part of the consideration of telephone notification for the Harris planning process (emergency response planning)? (iv) do you remember whether alternatives to telephone notification, e.g. tone alert radios, etc., were considered? Please explain what you remember, both in general, and for every subpart for which your answer is affirmative.

ANSWER: (a) This question was fully answered in the response to 57-C-3-1(f). No documentation exists.

(b) None.

(c) It was not considered necessary; the consideration was informal.

(d) N.C. DEM's informal consideration relied on first hand experience.

(e) The merits of a telephone notification system relative to the warning systems already in use in the state were considered.

INTERROGATORIES ON EDDLEMAN 213

INTERROGATORY NO. 213-3(a): Refer to your answer to 213-1(d): Do you agree that the job titles or names of persons responsible for verifying (in the field) and/or receiving reports verifying (in the Emergency Operations Center) that persons on the Harris Lake have been notified of an accident at the Harris nuclear plant, should be part of the plan (off-site emergency response plan)?

(b) Please fully explain all reasons for your answer to (a) and identify any documents or authorities you rely on in making that answer.

(c) What is the job title of the person or persons responsible for receiving reports that notification of persons on or in the Harris Lake has been accomplished?

(d) [W]hat is the job title of the person or persons responsible for notifying persons on or in the Harris lake of a nuclear accident at the Harris plant? If more than one job title is involved, please give all the titles, including those of back-up personnel.

(e) Who is responsible for ordering the notification of persons on or in the Harris lake of an accident at the Harris nuclear plant? Please give name or job title.

ANSWER: (a) - (b) Yes. Annex J of the plan is the basic document controlling notification procedures for Harris Lake. As such, it contains the names and affiliations of persons responsible for carrying out these functions. Annex J will be available by the end of September 1984. However, a printer's copy can be made available sooner, upon request.

(c) The Wake County Sheriff.

(d) - (e) This information is in Annex J, as noted in the responses to (a) and (b) above.

INTERROGATORY NO. 213-4(a): What are the means for giving an instructional message or an informational message to persons on or in the Harris lake in the event of a nuclear accident at the Harris plant?

(b) Please describe each such means in detail, explain why it was included (or will be included) in the emergency response plan, and identify all documents concerning these means, your authority or ability to use them, what personnel are required to operate these means, how many, where they work, who their backup personnel are, where the backup personnel work, how many people are required to operate each means, all backup means of notification for persons on/in the Harris lake, and the above information for each backup means of notification.

(c) What is the content of the instructional message for persons on/in the Harris lake in the event sheltering is ordered? Does it provide for sheltering at or near the lake? If

not, what does it provide? What will persons on/in the Harris lake be told to do, if sheltering is the overall response for the EPZ that is ordered?

ANSWER: (a) - (b) This information is available in Annex J.

(c) The instructional message on signs around the lake will advise that, upon notification, persons are to leave the lake immediately and to turn on radios and televisions for information and instructions. The instructions provided via radio and television will, if appropriate, direct people concerning sheltering actions.

INTERROGATORIES ON EDDLEMAN 57-C-10

INTERROGATORY NO. 57-C-10-5(a): Please refer to your supplemented answer to 57-C-10-3-d. Were any methods for assessing sheltering effectiveness for structures in the Harris EPZ used, which were NOT intended to provide emergency planners with a data base for a wartime nuclear emergency? Please identify each such method and its results for structures within the EPZ, and all documents concerning the method and/or its results for such structures or other structures.

(b) Does "wartime nuclear emergency" mean (i) Nuclear war? (ii) nuclear weapons attack? (iii) explosion of nuclear weapons? (iv) conditions of fallout after a nuclear explosion or explosions? -- please specify what it means.

ANSWER: (a) No. The state shelter survey was conducted for purposes related directly to civil defense during a wartime nuclear emergency.

Results of the state survey and supporting documents have been provided.

(b) Wartime nuclear emergency means a wartime situation involving the actual or potential risk to the public from radiation; i.e., fallout after a nuclear explosion.

INTERROGATORY NO. 57-C-10-6(a): Were any differences between (i) wartime nuclear emergency conditions (ii) nuclear weapons fallout conditions, and likely conditions for a serious accident at the Harris nuclear plant, considered in the sheltering effectiveness estimates made for structures in the Harris EPZ?

(b) Please specify each such difference and how it was considered. Please identify all documents concerning the effect of each difference on the Protection Factor (PF) or sheltering effectiveness for structures or any specific structure(s) within the Harris EPZ.

(c) What account of infiltration of (i) radioactive gases (ii) radioactive particles, with incoming air, is taken in (aa) the sheltering effectiveness or PF estimates you now possess (bb) sheltering effectiveness or PF estimates for use in connection with a nuclear accident at the Harris plant? If there is no difference, or the estimates are the same, please say so.

(d) How long is the maximum sheltering time for a nuclear accident at Harris?

(e) If you don't know a maximum sheltering time that might be required due to a nuclear accident at Harris, either (i) for the EPZ as a whole, (ii) for any part of the EPZ, or (iii) for any structure(s) or areas within the EPZ, please explain all reasons why you don't know.

(f) What is the maximum sheltering time that has been considered (i) for the entire EPZ (ii) for any part(s) of the EPZ -- please specify which parts (iii) for any structure(s) or specific location within the EPZ -- please specify which structure(s) or specific locations.

(g) Do any PF estimates for structures within the Harris EPZ assume any sealing of air pathways (i) into the structure (ii) into sheltering areas within the structure? If so, please describe what sealing is assumed, what materials are needed to do this sealing, the availability of those materials at the structure, and the additional protection assumed or calculated or believed to result from such sealing.

(f) [sic; (h)] How long can occupants of any sealed area or structure (see (e) above) stay in shelter without exhausting

their air supply? Have you made any calculations or estimates for any structures within the Harris EPZ?

(g) [sic; (i)] Do you know anything about the infiltration rates of (i) air (ii) particles, including particles of the size and characteristics of radioactive particles that might be released from Harris during a nuclear accident (iii) radioactive gases, into structures within the Harris EPZ or any such structure or structures? If so, how do such infiltration rates affect the radiation doses likely to be received by persons sheltering within those structures? Please detail all basis, documentary or otherwise, for your answers.

ANSWER: (a) No, the shelters to house evacuees are located outside the 10-mile EPZ. If in-place sheltering is selected as a protective response within the 10-mile EPZ, the public will be advised to remain in whatever shelter they are in.

(b) See (a) above.

(c) None.

(d) The maximum time for in-place sheltering within any area of the 10-mile EPZ could be on the order of a few hours depending on the nature of the accident and environmental conditions.

(e) There are many factors which affect sheltering time. These factors include both plant and environmental conditions. The numerous combinations of these factors make it difficult to identify one maximum value of sheltering time.

(f) See (d) above.

(g) The shelter survey noted in the responses to Interrogatories 57-C-10-2 and 57-C-10-4 is intended for use in wartime. It did not assume any sealing of air pathways.

(f) [sic;(h)] The structures will at no time be completely sealed so as to prevent air exchange with the outside environment. Consequently, the problem of exhaustion of air supply will not occur.

(g) [sic;(i)] Yes, only as it pertains to the Manual of Protection Action Guides and Protective Actions for Nuclear Incidents (EPA-520/1-75-001), item 1.6.3.2, which indicates generally that such shelters are effective for a few hours.

INTERROGATORY NO. 57-C-10-7(a): Where are "protection factor categories" as used in your assessment of PFs for structures within the EPZ, defined or explained?

(b) Do you have any information about the specific PFs within each category, for structures within the Harris EPZ?

(c) If so, what is that information? Please identify all documents containing such information.

ANSWER: (a) PFs are not taken into consideration for structures used for in-place sheltering or for shelters used to house evacuees outside the 10-mile EPZ.

(b) No. However, specific PFs were evaluated for isolated structures within the Harris EPZ, for wartime planning. These PFs were not considered for shelter planning in support of the Harris plant.

(c) The information about the specific PFs within each category is contained in the Federal Emergency Management Agency's National Fallout Shelter Survey Facility Booklets for Lee, Wake, Harnett, and Chatham Counties. These documents are stored at the Home of Record, Region IV, Thomasville, Georgia.

INTERROGATORY NO. 57-C-10-8(a): Refer to your answer to 57-C-10-3-e. Is this all the information you have about typical housing within the Harris EPZ?

(b) Does section 4.5.2 of the on-site emergency plan contain some seven lines (about 4 sentences) concerning housing within the Harris EPZ?

(c) Why is this information in the on-site plan, but not in the off-site plan?

(d) Are the PFs reported there based on any typical house shape or characteristics?

(e) Please identify all documents that concern, or explain, how the PFs in section 4.5.2 of the Harris on-site emergency plan were calculated for typical housing. Please answer 57-C-10-3-e again insofar as your answer involves any definition of a "typical" structure or structures.

(f) Please explain how the PFs of section 4.5.2. of the Harris on-site emergency plan were calculated, including base data used, calculation method(s) used, and all assumptions used or made in the calculation. Please also explain who did the calculation of these PFs and why it was done.

(g) Do the PFs of Harris on-site plan section 4.5.2 take into account the effects of (i) radioactive gases (ii) radioactive particles, infiltrating into the houses/apartments within the Harris EPZ with normal air infiltration? If so, exactly how do they do so? Were any particular wind conditions used in estimating infiltration of radioactive gases or particles into structures typical within the Harris EPZ (houses, apartments or other structures)? If so, please specify the assumption.

ANSWER: (a) Section 4.5.2, paragraph 3, of the SHNPP EP provides a description of "typical housing within the Harris EPZ."

(b) Copies of the referenced document have been served on all parties to the proceeding.

(c) The offsite plan instead references the Manual of Protection Action Guides and Protective Actions for Nuclear Incidents (EPA-520/1-75-001).

(d) Yes. As stated in Section 4.5.2 of the SHNPP EP, the PFs apply to masonry and wood frame houses with no basements.

(e) The PFs in Section 4.5.2 of the SHNPP EP were derived from the document "Public Protection Strategies for Potential Nuclear Reactor Accidents: Sheltering Concepts with Existing Public and Private Structures," SAND 77-1725. The previous response to 57-C-10-3(e) is accurate.

(f) See SAND 77-1725.

(g) No. The PFs are the reciprocals of the respective shielding factors specified in Tables 1 and 2 of SAND 77-1725. These numbers apply to radiation originating from outside the houses.

INTERROGATORY NO. 57-C-10-9(a): How much space is considered to be space for one shelteree? Is this amount of space different for small children, for babies, for the ill or infirm? If so, how does it differ for different people?

(b) How long are persons assumed to be able to remain in shelteree spaces within structures in the Harris EPZ? Is food provided in buildings within the Harris EPZ that are fallout shelters? Is that food in edible condition? Is there drinking water stored in or near high-PF areas of structures in the Harris EPZ? Has it been verified to be drinkable? If so, when? (most recent date or time if known) How long can shelterees be expected to stay in high-PF areas without (i) food (ii) water? What toilet facilities are provided in high-PF areas within structures in the Harris EPZ? Do you think people might leave high PF areas where toilet facilities are not available, e.g. briefly, to use the toilet?

ANSWER: (a) A square footage per person criteria was not considered for in-place shelters within the 10-mile EPZ. For shelters to house evacuees outside the 10-mile EPZ, a 40 square foot per person criteria was used by the counties.

(b) Because in-place sheltering within the 10-mile EPZ is not likely to exceed a few hours (see response to 57-C-10-6(d)), the in-shelter storage of food and water and the presence of toilet facilities are not considerations. Shelters located outside the 10-mile EPZ used to house evacuees include both cooking and sanitary facilities to support a several day stay if necessary. Limited food and water are available at each designated shelter with provisions to resupply as needed.

INTERROGATORY NO. 57-C-10-10(a): How are ventilation systems, e.g. (i) heating (ii) cooling (iii) ventilation w/o heating or cooling, considered in assessing the PF of (aa) buildings (bb) houses (cc) apartments (dd) other structures, within the Harris EPZ? How long can such systems be turned off during sheltering?

(b) How long can heating systems remain off for sheltering on cold nights (e.g. freezing temperatures, with winds of 10 mph or more) before adverse effects on shelterees (i) occur (ii) may jeopardize people's willingness to stay in shelter?

(c) How long could cooling systems be turned off, with persons packed into shelteree spaces, on a hot summer day (e.g. temperatures in the 90s, high humidity) before adverse effects on shelterees (i) occur (ii) jeopardize people's willingness to remain in shelter?

(d) How long can external ventilation be turned off during sheltering before adverse effects on shelterees occur?

(e) Please describe any adverse effects to shelterees that may result from turning off of heating, or cooling, or ventilation systems during sheltering. Please also describe how (if at all) such effects are considered with respect to structures in which persons in the Harris EPZ might be asked to take shelter during a nuclear accident. Please identify all documents concerning (i) adverse effects of having heating, or cooling, or ventilation, systems turned off during sheltering (or, in general); (ii) consideration of heating, cooling or ventilation with respect to structures in the Harris EPZ in which people might shelter; (iii) degree of adverse effects under which people may leave shelter during a nuclear power plant accident, or the difference between such conditions and

the conditions under which people may leave shelters during a military nuclear emergency or nuclear war or nuclear bomb fall-out situation; (iv) degree of adverse effects which would likely cause people to leave a shelter during a nuclear power plant accident.

(f) Does shelter effectiveness analysis always assume ventilation is off?

ANSWER: (a)-(e) Specific effects and times are unknown. However, because the maximum in-place sheltering period is likely to be on the order of a few hours, depending upon conditions, any adverse effects should be minimal. Shelters outside the 10-mile EPZ will have heating and ventilation systems in operation as appropriate.

(f) A shelter effectiveness analysis was not conducted. However, in-place shelterees within the 10-mile EPZ will be advised to close all windows and doors, and to cut off fans and air conditioners.

INTERROGATORY NO. 57-C-10-11(a): How are construction techniques relating to the air tightness of walls, ceilings, floors, windows and doors considered in determining the sheltering effectiveness of structures within the Harris EPZ?

(b) Have any direct measurements of the air tightness of construction of such structures been made, e.g. with blower doors or other air-infiltration measuring equipment?

(c) Please identify all documents concerning the matters inquired about in (a) and/or (b) above, particularly including estimates or measurements of the specific air-tightness of construction of structures within the Harris EPZ.

(d) Why were effectiveness of structures within the food stores eliminated from consideration in the surveys of sheltering effectiveness of structures within the Harris EPZ?

(e) Are food stores considered less safe shelters than other structures of similar construction?

ANSWER: (a) No shelter effectiveness analysis was conducted in support of the Harris emergency plans.

(b) Not applicable.

(c) Not applicable.

(d) For wartime planning purposes, people will not be sheltered in foodstores, since they will serve as points for food distribution. Therefore, they were not surveyed for wartime planning purposes.

(e) The safety of foodstores as shelters depends upon the structure of the individual buildings.

INTERROGATORY NO. 57-C-10-12(a): Have any formal shelter location sketches been made for any structures within the Harris EPZ?

(b) Please identify all documents containing shelter location sketches, formal or informal, for any structures within the Harris EPZ.

(c) Please identify all documents showing where the highest PFs are located in structures within the Harris EPZ. Please identify any document showing such areas within any such structure.

ANSWER: (a) Yes, for war-related planning.

(b) National Fallout Shelter Facility Booklets, stored at Home of Record in Thomasville, Georgia.

(c) See response to (b) above.

INTERROGATORIES ON EDDLEMAN 57-C-13

INTERROGATORY NO. 57-C-13-3(a): Is your answer to 57-C-13-1 complete, e.g. with respect to parts (g) and (h)? If not, please provide answers.

(b) [W]hat (i) medical supplies (ii) toilet facilities, are available in high-PF areas within hospitals or nursing homes within the Harris EPZ?

(c) Why haven't "best" PF determinations for hospitals or nursing homes within the Harris EPZ been made? Please give all reasons.

(d) What PF determinations have been made, if any, for any (i) hospital (ii) nursing home, within the Harris EPZ?

ANSWER: (a) The wartime shelter survey includes notation of food preparation and serving facilities. It also identifies a source of water but does not note storage of food or water. For each structure surveyed, the capacity of each PF category within that structure is calculated.

(b) The presence of medical supplies and toilet facilities is not included in the wartime survey. The information has also not been gathered for purposes of Harris emergency planning.

(c) - (d) Based on federal facility survey guidance, one hospital within the 10-mile EPZ has been surveyed to date. The second hospital within the 10-mile EPZ will be surveyed prior to the opening of the SHNPP. Nursing homes within the 10-mile EPZ have not been surveyed.

INTERROGATORY NO. 57-C-13-4(a): Are there any hospitals, nursing homes, or other care facilities within the Harris EPZ besides those listed in Table 4-5 of the Evacuation Time Estimates (ETE) which the state or county emergency planners are aware of?

(b) Have any factors, such as increased sensitivity of ill or elderly persons to radiation exposure, been considered in PF determinations for hospitals or nursing homes or other care facilities within the Harris EPZ?

ANSWER: (a) The hospitals, nursing homes, and other care facilities listed in Table 4-5 of the Evacuation Time Estimate are the only ones of which state or county emergency planners are aware.

(b) These factors were not considered in PF determinations for wartime related surveys. PF surveys are related to structural aspects of buildings and do not take into account factors such as increased sensitivity of ill or elderly persons to radiation exposure.

INTERROGATORIES ON EDDLEMAN 30

INTERROGATORY NO. 30-3(a): With respect to your answer to 30-2(d), are there any places in the Harris emergency response (off-site) plan where specific quantities of KI or other radioprotective drugs are mentioned?

(b) Are you aware of any reports, or recent declarations of policy or resolutions of health-profession associations, which address the desirable availability of KI or other radioprotective drugs during radiological emergencies? Please identify all documents containing or reporting on such reports, resolutions or policies.

(c) How, if at all, do the reports, declarations or policies you identify in response to (b) above (or that you were asked to identify in (b) above), affect your answers to 30-2(a) and 30-1 subparts (b) thru (i)?

ANSWER: (a) The offsite plan presently does not mention specific quantities of any radioprotective drugs.

(b) Yes. During the Annual Meeting of the American Pharmaceutical Association in Montreal, Canada (May 5-10, 1984), the Report of the Policy Committee on Scientific Affairs contained a section, Part D, entitled "Potassium Iodide for

Nuclear Accidents." The House of Delegates declined to adopt this section of the report and voted to refer it back to Committee for further consideration.

Documentation of this action can be found in the May 18, 1984 issue of apharmacy weekly, Volume 23, Number 19, page 75, and in the July 1984 issue of American Pharmacy, Volume NS24, Number 7, pp. 76-77.

(c) The report has had no effect upon the answers provided to the interrogatories.

INTERROGATORY NO. 30-4(a): Have you made any evaluation of the Harris Emergency Response Plan's plans for distribution of KI, as far as its compliance with NUREG-0654 or other applicable guidance is concerned?

(b) Please identify all documents relating to such evaluation(s), the applicable guidance, and the results of each such investigation.

(c) Do you plan to make any such investigation? If so, when? When do you expect to complete this investigation?

ANSWER: (a) Yes.

(b) The evaluation was made on the basis of guidance in NUREG-0654. The result of the evaluation was that the plans for distribution of KI are in compliance with this guidance.

(c) Not applicable.

INTERROGATORY NO. 30-5(a): Are there any applicable FEMA or NRC guides for any of the items inquired about in 30-1(b) thru (i)? If so, please specify the guidance for each item and the document or documents which identifies that guidance. Please identify all documents and page references which contain each such item of guidance.

ANSWER: (a) Yes. Such guidance appears in Part II, Section J of NUREG-0654, Revision 1, (November 1980) pp. 59-65.

INTERROGATORY NO. 30-6(a): Does the State of NC maintain no reserve of KI at any place for use during nuclear plant accidents?

(b) What provisions for KI use are established for (i) the Brunswick nuclear plant (ii) the McGuire nuclear plant, and how do these provisions differ, if at all, from those for KI use in emergency conditions at the Harris plant?

(c) Please identify all documents concerning matters inquired about in (a) or (b) above. Please tell for each the matter(s) it relates to.

ANSWER: (a) As has been stated in the answer to Interrogatory 30-2(a), Ninth Set, with respect to 30-1(h), an estimated 5000 bottles of state-purchased potassium iodide tablets are being reserved for use during an emergency at the Harris Plant.

(b) (i) At present, an estimated 6000 bottles of state-purchased potassium iodide tables are available for use during an emergency at the Brunswick Plant.

(ii) At present, an estimated 9000 bottles of state-purchased potassium iodide tablets are available for use during an emergency at the McGuire Plant.

The plans for the storage, distribution, and use of potassium iodide tablets for the Harris, Brunswick, and McGuire Plants are essentially the same.

(c) The plans for the storage, distribution, and use of potassium iodide are reflected in the offsite plans for the

Brunswick and McGuire plants. Working documentation of the North Carolina Division of Health Services contains specific information about the locations and quantities of KI supplies, and the names and phone numbers of people with access to those supplies, pertaining to the Brunswick and McGuire nuclear plants.

INTERROGATORIES ON EDDLEMAN 224

INTERROGATORY NO. 224-3(a): Were the analyses in ER section 2.3.1 (or FSAR sections 2.3.1 or 2.3.2) made specifically for adverse weather in the Harris EPZ?

(b) Which of the items in your response to 224-1-b(aa) thru (hh) were made for the Harris EPZ?

(c) What information do you possess that indicates that the FSAR adverse weather frequencies (i) are (ii) may not be (iii) are not representative of the frequencies of such weather in the Harris EPZ? Please identify all documents and all reasons concerning your answers to (i), (ii) or (iii) or underlying such answers.

(d) Does the State or the County emergency planners possess any information on the frequency of adverse weather conditions in the Harris EPZ (i) different from (ii) in addition to, that in the Harris FSAR and ER as shown in the responses to interrogatory 224-1(a), (b) and (c)?

(e) If so, please identify all information, and all documents containing information, responsive to (d)(i) or (d)(ii) above.

ANSWER: (a) The analyses in ER Section 2.3.1 (or FSAR Sections 2.3.1 or 2.3.2) were made specifically for the SHNPP Plant, which is within the Harris EPZ, and were based upon meteorological information from the closest available source of data required to complete that particular analysis. Although some of the input data used in the various analyses was based

upon sources of information which are outside of the 10-mile Harris EPZ, it is representative of Harris plant site conditions and is the best available information.

(b) See response to (a) above.

(c) Carolina Power & Light has included within ER Sections 2.3.3, 2.3.4, 2.3.5, and 2.3.6 and FSAR Section 2.3.3 the on-site meteorological data collected from the site. The shorter period of record from the on-site data when compared to surrounding longer term sources of meteorological data shows no climactically significant variations. Thus the adverse weather frequencies presented in the ER and FSAR are judged to be representative of the frequencies of such weather in the Harris EPZ.

(d) - (e) Respondents are not aware of any information which state or county emergency planners possess concerning the frequency of adverse weather specifically in the Shearon Harris EPZ, other than that previously identified in the response to Interrogatory No. 224-1.

INTERROGATORY NO. 224-4(a): Is it true (compare your answers to 224-2) that the Harris evacuation time estimates only consider adverse weather with respect to heavy rains?

(b) What other adverse weather scenarios were considered, when heavy rains was selected as the adverse weather scenario for the evacuation time estimates (ETEs)? Please identify all documents concerning these scenarios, who prepared them, how the selection was made, who made it, and why.

(c) Who were the state, and the local, emergency preparedness officials who had discussions on which adverse weather scenario(s) to use in the Harris ETE?

(d) What does each such official recall concerning those discussions?

(e) What does each CP&L or HMM participant recall concerning those discussions? (Your answers to (d) and (e) should include, if known, the date(s), length of time, and nature of the discussions, the information reviewed or referenced in the discussions, what positions if any were taken by the persons involved in the discussions, and any documents concerning such discussions should be identified, be it notes, handwritten notes, minutes, memoranda, tape recordings, or other records of any kind).

ANSWER: (a) The adverse weather evacuation time estimates presented in the ETE represent a heavy or severe rain-storm condition, resulting in a 25 percent reduction in roadway capacity and travel speeds. This is the only adverse weather condition evaluated in the evacuation time estimate report. However, this adverse weather scenario is generally representative of conditions where visibility is impaired, roadway capacities reduced, and normal traffic operations impeded, compared to the fair weather conditions.

(b) Consideration was given to all adverse weather conditions which occur within the Shearon Harris EPZ. This included rain, fog, flooding and high winds. Informal discussions between HMM Associates, CP&L and state and county emergency preparedness officials and a review of weather frequency and severity data presented in the Shearon Harris FSAR led to the selection of a heavy rain storm condition as that most appropriate for the evacuation time estimate study.

(c) Mr. James Self, North Carolina Division of Emergency Management;

Mr. Mark Scott, Chatham County Civil Preparedness Agency;
Mr. Carl Lucas, Harnett County Emergency Management Agency;

Mr. Billy Ray Cameron, Sanford-Lee County Department of
Emergency Management; and

Mr. J. Russell Capps, Wake County Emergency Management
Agency.

(d) The identified individuals have reviewed and concurred with the ETE study. Applicants do not know what these officials recall concerning discussions held during the course of the evacuation time estimate study.

(e) The discussions with the state and county emergency preparedness officials were informal in nature and no minutes were kept. The discussions focused on identifying an adverse weather condition which, in the opinion of the emergency preparedness officials, would provide a useful frame of reference for emergency preparedness decision-making.

INTERROGATORY NO. 224-5(a): Is it possible, in your view, that evacuation times under adverse weather conditions other than heavy rain could be (i) greater (ii) lesser, than those for the heavy rain scenario?

(b) Please identify all adverse weather scenarios for which you believe the Harris evacuation times would be (i) greater (ii) lesser (iii) about the same as (give range of uncertainty, e.g. within 5 minutes), as the evacuation time estimates for heavy rains.

(c) Please identify all information you possess concerning (i) roadway capacity (ii) travel speeds (iii) accident frequency (iv) weather-related complications, due to adverse weather conditions including (aa) thru (hh) of interrogatory 224-1(b). Note that item (ee) of that list is "heavy rain" as used in the ETE.

(d) Please identify any information you have concerning the effect of fog, ice, snow, rain, heavy rain, hail, tornados, freezing rain, ice storms, or other adverse weather on (i) visibility (ii) travel speeds (iii) ability of people to control vehicles or avoid accidents, under conditions such as documented for the Harris EPZ as having occurred or being possible (e.g. as documented in the FSAR or ER), particularly on winding, two lane roads with slopes and/or curves like those in the Harris EPZ. Please identify all documents containing such information, and all documents re this in possession, e.g. of the state Dept of Transportation, Highway Patrol, etc. also.

ANSWER: (a) It is certainly possible that evacuation times under adverse weather conditions other than heavy rain could be greater or lesser than those developed for the ETE heavy rain adverse weather scenario. As a worst case, evacuation during a severe hurricane or tornado condition could take substantially longer than the scenarios modelled in the ETE. On the other hand, a light "misty" rain would likely result in conditions not significantly different than those during fair weather.

The ETE study presented representative evacuation times for fair and adverse weather conditions which could be used as a guide and as input in the emergency response decision-making process. Obviously, 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 selected adverse weather 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.

(b) See response to (a) above. Applicants have no reasonable means of identifying all adverse weather scenarios which are (i) greater or (ii) lesser than the heavy rainstorm condition used in the ETE, since the ETE adverse weather condition is representative in terms of its effect on roadway capacities and speeds during the course of the evacuation. Due to the numerous variables involved in adverse weather conditions (such as wind speed, rate of precipitation, visibility, and temperature) it is only reasonable to assess adverse weather in such a representative nature.

(c) - (d) Empirical data on the effects of adverse weather on roadway capacities and travel speeds is limited, and a survey of state agencies has not been undertaken. However, literature searches conducted by HMM Associates have resulted in the identification of three references presenting data on the impact of rain on roadway operations. These sources are:

The Environmental Influence of Rain on Freeway Capacity, E. Roy Jones and Merrell E. Goolsby, Highway Research Record, No. 321, Highway Research Board, 1970.

Headway Approach to Intersection Capacity, Donald S. Berry and P.K. Gandhi, Highway Research Record No. 453, Highway Research Board, 1973.

Interim Materials on Highway Capacity, Transportation Research Circular No. 212, Transportation Research Board, January 1980.

These references cite empirical data which focus on the relationship between adverse weather (rain) and roadway capacities and associated operations. Specifically, the available data deal with the effects which impaired operations and visibility due to rain conditions have on traffic flow. Applicants are not aware of specific empirical data which present similar effects due to hail, tornadoes, freezing rain, ice storms or snow storms.

One additional reference presents data on an actual evacuation near a nuclear power plant facility, which was conducted during heavy rains and fog. The study Detailed Report on the Evacuation of December 11, 1982 (prepared by Envirosphere Company for Louisiana Power and Light Company, December 1983) indicates, at page 43, that despite the adverse weather conditions present at the time of the evacuation, traffic moved smoothly with very few traffic back-ups or accidents.

INTERROGATORIES ON EDDLEMAN 215

INTERROGATORY NO. 215-10(a): Do the State, or County emergency planners, have or have access to any information concerning the number of persons (or percent of population) in the Harris EPZ that is at home at various times of the day or year (i) with transportation (ii) without transportation (iii) without regard to whether they have transportation, just that they are home?

(b) Does the State, or county emergency planning personnel, have any plans to analyze either the questions asked in 215-10(a) above, or that asked in 215-2(a)?

ANSWER: (a) - (b) Respondents presently have no such information concerning the percentage of the population with or

without transportation that is home at various times of the day and year. Respondents are not aware of any present plans to analyze such variability.

INTERROGATORY NO. 215-11(a): In concurring with the evacuation time estimates made for CP&L by HMM associates, what did the state and county emergency planners do to analyze (i) the accuracy (ii) the degree of conservatism, of those estimates? Please answer specifically what you did to review those time estimates and exactly how you determined that you concurred with them. If you do not now concur with the estimates, please give all reasons for your non-concurrence.

(b) Have you made any analysis of how accurate the one-family-per-vehicle assumption is for the Harris EPZ (i) under any conditions (ii) under the specific condition that people are asked to help evacuate persons without transportation (iii) at night, e.g. during normal sleeping hours (iv) in conditions of snow, ice, or ice storms or freezing rain? Please identify all documents concerning each such analysis and succinctly state your analysis.

ANSWER: (a) 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 and evacuation procedures) are site-specific or area-specific, and were in this case appropriately 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 provides a reasonable basis for protective action decision-making for a potential incident at the Shearon Harris plant.

(b) Applicants have not made any specific analysis to test the accuracy of the assumption that one vehicle would evacuate from each permanent resident household. The ETE methodology used documented assumptions of vehicle occupancy and anticipated evacuation characteristics associated with each individual population category (i.e., permanent residents, transients and special facilities). For permanent residents, it was assumed that one vehicle would evacuate from each household after notification and preparation for evacuation. This assumption was used and is considered valid for all conditions including evacuation during day or night periods, and evacuation during fair or adverse weather conditions.

INTERROGATORY NO. 215-12(a): Is all the documentation concerning the assumptions of the ETE re (i) vehicle occupancy (ii) anticipated evacuation characteristics (compare your answer to 215-3(c)) fully referenced or documented in the ETE report by HMM associates? For any that are not, please give full references and identify all documents in which these assumptions are documented.

(b) Are you aware of any information disputing the validity of these assumptions, or any of them? Please identify all documents you are aware of in which any of these assumptions (please specify which) is disputed or questioned. ("these assumptions" are the ones in the HMM ETE report concerning vehicle occupancy and evacuation characteristics associated with each individual population category)

(c) What "federal guidance" do you say is consistent with your one vehicle per household assumption?

(d) Are you saying the federal guidance requires such an assumption? If so, please identify what guidance you maintain requires it.

(e) Are other assumptions about the numbers of vehicles per evacuating household also consistent, in your view, with federal guidance applicable to ETEs?

ANSWER: (a) The documentation on assumptions used in the evacuation time estimate study concerning (i) vehicle occupancy and (ii) anticipated evacuation characteristics are presented in Section 3 and 6 (refer to the vehicle occupancy summary presented in Table 3-7, and discussions presented in sub-sections 3.1, 3.2, 3.3, and 6.2 of the ETE study) of the evacuation time estimate study.

(b) Applicants are not aware of any empirical data or other related information disputing the validity of the assumptions on vehicle occupancy and evacuation characteristics associated with each population category presented in the HMM ETE report.

(c) NUREG-0654, Rev. 1, at 4-3 states:

The number of vehicles used by permanent residents is estimated using an appropriate auto occupancy factor. A range of two to three persons per vehicle would probably be reasonable in most cases. An alternative approach is to calculate the number of vehicles based on the number of households that own vehicles assuming one vehicle per household is used in evacuation.

In addition, NUREG/CR-1745 (Analysis of Techniques for Estimating Evacuation Times for Emergency Planning Zones, U.S. NRC, November 1980), at 21, indicates that:

This population data [permanent residents] would then be translated into a projected number of vehicles using an appropriate auto occupancy factor. A range of 2 to 3 persons per vehicle would probably be reasonable in most cases, however, any rational basis would be appropriate. For example, one vehicle per household might be a reasonable assumption.

(d) Federal guidance does not, in fact, require such an assumption. It does, however, present this methodology as a reasonable basis for estimating vehicle demand associated with the permanent resident population category.

(e) Yes, use of a vehicle occupancy in the range of 2-3 persons per vehicle would also be consistent with federal guidance. It is worth noting that the average household size within the EPZ is 2.7 persons per household. Accordingly, one vehicle per household translates to approximately 2.7 persons per vehicle, which is in the range of that considered reasonable in NUREG-0654, Rev. 1 and NUREG/CR-1745.

INTERROGATORY NO. 215-13 (refer to your answers to 215-4):

(a) Do you have any information or studies which support your assumptions concerning evacuation behavior of persons as stated in your answer to 215-4(a)? Please identify all documents containing such information or studies.

(b) Is there any inconsistency between your answer to 215-4(a) and your response to 215-3(c) appearing immediately above the answer to 215-4(a), which refers to "empirical data on past evacuations, indicating the tendency of family units to unite and evacuate as a unit", particularly as regards evacuation from recreational facilities, workplaces, or special facilities? Please explain how or why these answers are (i) consistent (ii) inconsistent. [P]lease also identify all documents concerning empirical data from past evacuations, specifying which were evacuations from around nuclear plants due to nuclear accidents.

(c) Please detail the review of the assumptions in responses to interrogatories of the past (215-1 thru 9, all parts and subparts) which were made (or was made) by state and local emergency preparedness officials (see response to 215-4(a)). Specifically, which officials reviewed these assumptions, when did they do it, are there any documents related to their review (including notes or recordings etc) (please identify all such documentation), and what was the specific result of their review as to each assumption, most particularly re (i) one vehicle per household (ii) evacuation directly from work, school, care facilities, and workplaces (iii) evacuation from recreation facilities (e.g. would these people go home to check their families first if their families live in the EPZ) (iv) vehicle occupancy rates, (v) number of persons to be evacuated who do not own cars (vi) furnishing of rides by neighbors during an evacuation (vii) furnishing of rides to persons without transportation due to coordinated efforts by state and county emergency preparedness officials; (viii) one vehicle per household for the non-auto-owning population; (ix) that vehicle departures from households would be distributed over a two-hour period.

(d) Was any evaluation made by state or county emergency preparedness officials of CP&L's "demographic data report" [sic]? If so, who made it, when, and with what results? Did the State rely on these reports in evacuation planning? Have the reports been check by anyone? If so, with what results? Did the counties rely on these reports in evacuation planning?

ANSWER: (a) Applicants are not aware of empirical data or studies which indicate exactly where all persons evacuating would begin the evacuation. The evacuation assumptions of the various population components used in the ETE represent the basis for simulation of realistic evacuation traffic flow conditions. The methodology used to develop the total population and vehicle demand estimates within the Shearon Harris EPZ does incorporate some double-counting. For example, it is reasonable to assume that a portion of the identified employees within the area and visitors to recreational areas are also permanent residents of the EPZ. In addition, school children,

treated as an independent special facility category, are also included in the permanent population estimates. This double-counting of population, however, is done intentionally to implicitly simulate realistic traffic flows on the roadway network. That is, the methodology does over-estimate total population somewhat, but more accurately reflects realistic vehicle activity on the evacuation roadway network (e.g., vehicles will be evacuating major recreation areas, whether they are destined to homes within the EPZ, or directly outside of the EPZ; and during work periods employees will be departing from their place of employment, destined either home within the EPZ, or directly outside of the EPZ).

(b) From the standpoint of traffic flow, the assumption that the permanent population will evacuate from their place of residence is not inconsistent with additional assumptions in the ETE that:

Persons visiting major recreation areas will evacuate from those areas;

Persons at major places of employment will evacuate from those places; and

Persons in special facilities will evacuate from those facilities.

The methodology used for the ETE study results in the most realistic representation of anticipated traffic flows from places of residences, work places and major recreation areas.

Applicants are aware of empirical data from past evacuations, documented in the following sources:

- Reference 1: Evacuation Planning in the TMI Accident, Federal Emergency Management Agency, RS 2-8-34, January 1980.
- Reference 2: Mississauga Evacuates: A Report on the Closing of Canada's Ninth Largest City, NUS Corporation, [Proprietary] 1980.
- Reference 3: Texas Hurricane Evacuation Study, Texas Transportation Institute, September 1978.
- Reference 4: Evacuation Risks - An Evaluation, U.S. EPA, Hans and Sell, EPA-520/6-74-002, June 1974.
- Reference 5: Evacuation Planning in Emergency Management, Perry, Lindell, Greene, 1981.
- Reference 6: Detailed Report on the Evacuation of December 11, 1982, Envirosphere Company, December 1983.

Only one of these, Reference 1, concerned evacuation from around nuclear plants due to a nuclear accident.

(c) The various assumptions used to develop the evacuation time estimates presented in the ETE were developed based upon (1) informal discussions held with state and county emergency preparedness officials (refer to response to Interrogatory 224-4(c)) throughout the course of the study; (2) reviews, by HMM Associates, of empirical data on past evacuations; (3) knowledge and experience obtained by HMM Associates in

conducting similar evacuation time estimate studies for 22 nuclear power plant sites throughout the country, and (4) federal guidance (NUREG-0654, Rev. 1).

The discussions held with the state and county emergency preparedness officials were informal in nature. No minutes or transcripts were kept. Assumptions used in the study, including vehicle occupancy, evacuation procedures, and preparation and mobilization times, were reviewed with the officials cited in response to Interrogatory 224-4 and are presented in the ETE. The officials concurred in the assumptions.

(d) State and county emergency preparedness officials did not specifically review "Demographic Data for the Shearon Harris Nuclear Power Plant (SHNPP) Evacuation Time Estimate Report" (Revisions 0 or 1). However, CP&L demographic data, relevant to the preparation of the evacuation time estimates, were copied from Revision 1 and incorporated in the ETE. The ETE, including some of CP&L's demographic data, was reviewed by state and county emergency preparedness officials. Concurrence statements are found in Section 11 of the ETE.

The State used the ETE, which included CP&L demographic data from Revision 1.

The CP&L demographic report, Revision 0, was reviewed by HMM Associates and CP&L personnel and results in the revisions indicated by "revision bars" in the right hand margin of Revision 1.

Review of Revision 1 by CP&L indicates that data on page 21 for hunting are incorrect. Correct data are indicated on page 68 of Appendix A. Additionally, recreational activity at Harris Reservoir appears to be higher than originally estimated. A creel survey is being conducted during 1984 and will enable refinement of the numbers.

INTERROGATORY NO. 215-14(a): Do you have any vehicle occupancy rate data for evacuations (i) that actually occurred (ii) that were estimated for other nuclear plants in NC? Please identify all documents containing such data.

(b) Do you have any data on how many vehicles are registered to each household in the Harris EPZ? On the capacity of vehicles registered in the EPZ (e.g. pickup trucks, 4-person, 5-person or 6-person cars)? Please identify all documents containing such data.

(c) Do you have any data on the number of persons in households w/o transportation within the Harris EPZ? Please identify all documents containing such data.

(d) Do you have any documentation of the basis for previously developed evacuation plan standards' estimates of likelihood that evacuees will use the "best available" automobile when evacuating? Do you have any information on use of more than one vehicle by evacuating families or groups? Please identify all documents containing such information.

(e) What is your exact basis for believing that "more than sufficient capacity will be available to accommodate persons in households without transportation? Please identify all documents, analysis or calculations you believe show this is true.

(f) How long will it take to get the non-auto-owning population into vehicles for evacuation? Please identify all documents and information concerning how long this would take.

(g) Precisely who "accepts" the traffic flow relationships used in NETVAC? Has NETVAC been independently evaluated re these relationships? Please identify all documents concerning these matters.

(h) Are the traffic activities on each roadway segment, for each reporting interval, available in the ETEs? If not, please identify all documents containing this information.

(j) Please explain how the number of persons beginning to evacuate in each time interval is evaluated in NETVAC, or how it is determined.

(k) Please explain whether any counterflow traffic (e.g. families uniting) is assumed in the Harris ETEs? If not, why not?

(l) [W]hat is the sensitivity of the Harris ETEs to (i) preparation times (ii) mobilization times? Please identify any documents re these matters.

ANSWER: (a) Applicants are aware of only one source indicating vehicle occupancy data for actual past evacuations. The Manual of Protection Action Guides and Protective Actions for Nuclear Incidents (U.S. EPA, EPA-520/1-75-001, Revised February 1980) indicates that "surveys during evacuation found 4/persons/car on the average" (at 1.33).

(b) Applicants' information on vehicle registration by vehicle type within the Shearon Harris EPZ is limited to calculated estimates by subzone and standard nuclear display unit for "1982 registered automobiles and small trucks." (See CP&L Demographic Data Report, revision 1, pages 28-29; and Appendix A pages 35-40, page 42.) Corresponding estimates of the number of houses by subzone and standard nuclear display unit are included in the same report. (See Appendix A, pages 16-21.) Average number of 1982 registered automobiles and small trucks for each house (residence) can be estimated from these data.

Applicants are not aware of any other data available on numbers of vehicles registered to each household in the EPZ or of data on the capacity of such vehicles.

(c) See section 3.1.2 of the ETE. This section describes the number of non-auto-owning residents in the EPZ. Sources of data are included.

(d) The planning standard that evacuees are likely to utilize the "best available" automobile when evacuating is outlined in the following documents:

Impacts of the Crisis Relocation Strategy on Transportation Systems, Volume II, Planning Guidelines, Department of Defense, Defense Civil Preparedness Agency, Doc. No. CPG-2-8-13, March 1977, at II-11.

Post Attack Impacts of the Crisis Relocation Strategy on Transportation Systems, Volume II, Revised Planning Guidelines, Department of Defense, Defense Civil Preparedness Agency, Doc. No. RS-2-8-24, March 1979, at II-11.

Applicants are not aware of any information on the use of more than one vehicle by evacuating families or groups.

(e) Given the number of households within the EPZ that own vehicles (an estimated 6,937 households out of a total of 7,347 households within the EPZ, refer to previous response to Interrogatory No. 215-5(c)) and the average number of persons per household (2.7 persons per household - refer to previous response to Interrogatory No. 215-5(c)), there is adequate basis to believe the more than sufficient capacity (i.e., carrying capacity) would be available to accommodate persons in

households without transportation (an estimated 410 households in the EPZ that do not own automobiles) through ride-sharing in vehicles with unoccupied seating.

(f) It is reasonable to assume that it would take varying amounts of time to "pick-up" the non-auto-owning population in vehicles for evacuation. The assumptions documented in the ETE provide for a period of up to 2 hours following notification for these activities.

(g) The traffic flow relationship and algorithms used in the NETVAC model are based upon empirical data, criteria and standards presented in the publications:

Highway Capacity Manual, Highway Research Board, Special Report 87, 1965.

Interim Materials on Highway Capacity, Transportation Research Circular 212, Transportation Research Board, January 1980.

The NETVAC model has been evaluated independently by NRC/FEMA in its use at 19 nuclear power plant sites throughout the country. All of these evaluations conducted to date have been accepted by the NRC/FEMA reviewers.

(h) The traffic activities along each roadway section of the evacuation network for each reporting interval are not presented in the ETE since, (1) such documentation is not required, and (2) the significant amount of print-out material is not easily reproduced.

(j) The number of persons beginning to evacuate at different time intervals is based, to a large degree, on the assumed preparation and mobilization times associated with the various population components. Section 6 of the ETE documents these preparation and mobilization departure distributions.

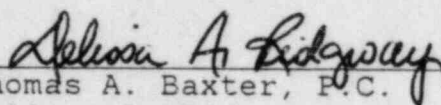
(k) The methodology used in the Shearon Harris ETE study did not specifically consider counter flow traffic. Such interaction, which would be expected, was however taken into account by evaluating vehicle origins at (1) places of residences, (2) major work places, (3) major recreation areas, and (4) at special facilities. Such an analysis provides a realistic assessment of the effects and consequences of such counter flow interaction. See response to 215-13(a) above.

(1) The methodology used in the Shearon Harris ETE study combines the times associated with preparation and mobilization events into a singular time distribution for each of the

population categories. The estimated evacuation times presented in the ETE indicate that, for most evacuation scenarios considered, the evacuation times are very sensitive to the preparation and mobilization times.

Dated: September 7, 1984.

Respectfully submitted,



Thomas A. Baxter, P.C.
Delissa A. Ridgway
Shaw, Pittman, Fotts & Trowbridge
1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1000

Richard E. Jones
Samantha Francis Flynn
Dale E. Hollar
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602
(916) 836-6517

Attorneys for Applicants


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) Docket No. 50-400 OL
MUNICIPAL POWER AGENCY)
)
(Shearon Harris Nuclear Power)
Plant))

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Response To Wells Eddleman's General Interrogatories To Applicants (10th Set)" were served this 7th day of September, 1984, by deposit in the U.S. mail, first class, postage prepaid, upon the parties listed on the attached Service List.


Delissa A. Ridgway

Date: September 7, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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SERVICE LIST

James L. Kelley, Esquire
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Glenn O. Bright
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. James H. Carpenter
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Charles A. Barth, Esquire
Janice E. Moore, Esquire
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Daniel F. Read, President
CHANGE
Post Office Box 2151
Raleigh, North Carolina 27602

John D. Runkle, Esquire
Conservation Council of
North Carolina
307 Granville Road
Chapel Hill, North Carolina 27514

M. Travis Payne, Esquire
Edelstein and Payne
Post Office Box 12607
Raleigh, North Carolina 27605

Dr. Richard D. Wilson
729 Hunter Street
Apex, North Carolina 27502

Mr. Wells Eddleman
718-A Iredell Street
Durham, North Carolina 27705

Richard E. Jones, Esquire
Vice President and Senior Counsel
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Dr. Linda W. Little
Governor's Waste Management Board
513 Albemarle Building
325 North Salisbury Street
Raleigh, North Carolina 27611

Bradley W. Jones, Esquire
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street
Atlanta, Georgia 30303

Steven F. Crockett, Esquire
Atomic Safety and
Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Robert P. Gruber
Executive Director
Public Staff - NCUC
Post Office Box 991
Raleigh, North Carolina 27602

Administrative Judge Harry Foreman
Box 395 Mayo
University of Minnesota
Minneapolis, Minnesota 55455

Spence W. Perry, Esquire
Associate General Counsel
FEMA
500 C Street, S.W., Suite 480
Washington, D.C. 20740