August 19, 1983

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 Nos. 50-400 OL
MUNICIPAL POWER AGENCY	)	50-401 OL
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

APPLICANTS' RESPONSES TO WELLS EDDLEMAN'S GENERAL INTERROGATORIES AND INTERROGATORIES ON CONTENTIONS 29 AND 37B TO APPLICANTS CAROLINA POWER & LIGHT COMPANY, et al. (FOURTH 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 on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)." Applicants' provision of answers to Intervenor Eddleman's interrogatories should not be deemed an admission of

relevancy with regard to the information provided by Applicants or that sought by Intervenor.

RESPONSES TO GENERAL INTERROGATORIES

G-1(a) Which contentions of Wells Eddleman do Applicants agree are now admitted in this proceeding, NRC Dockets 50-400/401 O.L.?

ANSWER: (a) See Applicants' Answer filed on April 28, 1983.

G-1(b) For 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: (b) The answers to the General Interrogatories herein are restricted to Eddleman Contentions 29 and 37B.

G-1(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: (c) The following list identifies those persons who provided information upon which Applicants relied in answering the interrogatories on Eddleman Contentions Nos. 29 and 37B and indicates the particular interrogatory answer(s) for which each such person provided information.

Person	INTERROGATORY NO(S). 1/
Ronald Shearin	29-9(a)-(h), First 29-11(b), 29-12(a), (c) & (d), First 29-19, Second 29-19, 29-27(a)-(h), (j)-(l).
Helm Lipa	29-23(e) & (f), 29-27(t), (w), (z).
Brian McFeaters	29-17.
Louis Martin	29-23(w) & (z).

The above individuals are employees of Carolina Power & Light Company, P.O. Box 1551, Raleigh, North Carolina 27602.

PERSON	INTERROGATORY NO(S).
John Garibaldi	29-9(g), 29-10, First 29-11, Second 29-11, 29-16, 29-24, 29-25, 29-28, 29-29, 29-30, 29-31.
Guy Martin, Jr.	29-13, 29-14, 29-15, 29-20, 29-21, 29-22, 29-23(a)-(d), (g)-

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1/ Intervenor has numbered two consecutive interrogatories as 29-11. In order to avoid further confusion, Applicants separately identify the interrogatories as "First 29-11" and "Second 29-11." This procedure is repeated for the consecutive interrogatories labeled as 29-19 and 37B-8.

(k), (n), 29-27(o)-(s), (u), (v).

John Mauro 29-27(m) & (n).

The above individuals are employees of Ebasco Services, Inc., Two World Trade Center, New York, New York 10048.

PERSON	INTERROGATORY NO(S).
Dr. Jacob I. Fabrikant	37B-6(a)-(c), (e)-(k), (u), (v), 37B-7, FIRST 37B-8(a)-(e), (j)-(p).

The above individual is an independent consultant to Carolina Power & Light Company, University of California, Berkeley, California.

G-1(d) Please identify all facts concerning which each such person identified in response to G-1(c)(1) above has first-hand knowledge.

ANSWER: (d) See Applicants' Response to (c) above.

G-1(e) Please identify all facts and/or documents upon which each person identified in response to G-1(c)(2) above relied in providing information to respond to the interrogatory, including the parts of such documents relied upon.

ANSWER: (e) All facts or documents relied upon by those individuals identified in the response to (c) above are indicated within each response to the specific interrogatories on Contentions 29 and 37B.

G-1(f) Please identify any other document(s) used or relied upon by Applicants in responding to the interrogatory.

ANSWER: (f) See Applicants' Response to (e) above.

G-1(g) Please state which specific fact each document, identified in response to G-1(e) and G-1(f) above, supports, in the opinion or belief of Applicants, or which Applicants allege such document supports.

ANSWER: (g) Within each response to the specific interrogatories on Contentions 29 and 37B, Applicants have indicated which specified facts are supported by the documents identified.

G-1(h) Please state specifically what information each person identified in response to G-1(c)(1) or G-1(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 G-1.

ANSWER: (h) See Applicants' Response to (c) above.

G-2(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 any 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: (a) Applicants have not yet identified the expert(s) or other witness(es) they expect to call in this proceeding. When witnesses are identified, Applicants will supplement this response in a timely manner.

G-2(b) Please identify each contention regarding which each such person is expected to testify.

ANSWER: (b) See Applicants' Response to (a) above.

G-2(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: (c) See Applicants' Resposne to (a) above.

G-2(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: (d) See Applicants' Response to (a) above.

G-2(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: (e) See Applicants' Response to (a) above.

G-3(a) Please identify any other source(s) of information which Applicants have used to respond to any interrogatory identified under G-1 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: (a) Applicants have identified all such other sources of information, if any, within the Answers to the specific interrogatories set forth herein.

G-3(b) Please identify any other source(s) of information not previously identified upon which any witness identified under G-2 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: (b) See Applicants' Response to General Interrogatory G-2(a) above.

G-4(a) Please 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: (a) Applicants have not yet identified which documents, if any, they intend to use in cross-examination of Mr. Eddleman's witness(es).

G-4(b) Please identify any undocumented information Applicants intend to use in cross-examination of each such witness for me.

ANSWER: (b) See Applicants' Response to (a) above.

G-5(a) For each contention Applicants state or admit is an admitted Eddleman contention under G-1(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: (a) Applicants have available to them experts and information on the subject matter of Contentions 29 and 37B.

G-5(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: (b) Not applicable.

G-6(a) For 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, section 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 the extent not identified in the document itself).

(viii) state whether Applicants 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 such 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.

OBJECTION and ANSWER: (a) Applicants will make available

copies of those documents identified in responses to interrogatories, as specified in the accompanying Response to Wells Eddleman's Request for Production of Documents. See Applicants' Response to General Interrogatories G-1(e), G-1(g), and G-1(h).

The qualifications of any authors, data utilized and source document information is equally available to Intervenor Eddleman, and would require Applicants to conduct extensive independent research and investigations, not required by the rules of discovery. Pennsylvania Power & Light Company, et al. (Susquehana Steam Electric Station, Units 1 and 2), ALAB-613, 12 N.R.C. 317, 334 (1980); Boston Edison Company, et al. (Pilgram Nuclear Generating Station, Unit 2), LBP-75-30, 1 N.R.C. 579, 584 (1975).

Applicants will specify if an author(s) of a document is currently employed by them or was in their employ at the time the identified document was written at the time of production of the document. Beyond this information, Applicants object to the provision of employment information as irrelevant to Applicants' reliance on, or the merits of the document.

G-7(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 G-1(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: (a) Applicants have not yet identified those documents they intend to offer as exhibits relating to Eddleman Contentions 29 and 37B.

G-7(b) Please identify all documents which Applicants plan, expect or intend to use in cross-examination of any parties' witnesses or joint intervenor witness in this proceeding, with respect to (i) Eddleman contentions identified under G-7(a)(i) (or G-1(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: (b) Applicants have not yet identified those documents they intend to use for cross-examination of any witnesses.

G-7(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: (c) See Applicants' Response to (b) above.

G-8(a) Please identify, for each Eddleman contention which is the subject of this or an earlier set of interrogatories, all information not previously identified which was (i) used or relied on in preparation of Applicants' responses to that contention and all contentions superseded by it (per transcript of July 1982 special prehearing conference, the Board's September 1982 order admitting contentions, or stipulation by Applicants or W.E. or otherwise), with respect to any facts alleged therein, identifying for each such fact the specific source(s) of information used or relied upon.

G-8(b) Please identify all persons who supplied information relied on or used in Applicants' Response to each

contention for which information is requested in G-8(a) above. (ii)(sic) Please identify for each such person what information was supplied, and with respect to which contention(s) each item of information supplied was used. (iii) Please state all known qualifications of each such person with respect to the subject matter of each contention for which that person supplied information.

G-9(a) Please identify all information not identified in response to the above general interrogatories, including all documents, which Applicants rely on or intend to use in making their case or carrying their burden of proof in this proceeding with respect (i) to each Eddleman contention which is the subject of this or an earlier set of Eddleman interrogatories to Applicants;

(ii) With respect to each joint contention on which discovery is now open under the Board's March 10, 1983 order, or on which discovery has been open under said order establishing a discovery schedule. (The phrase "or on which discovery has been open" is intended to keep this interrogatory current and continuing for information and documents which Applicants rely on or form intent to use after the formal close of discovery. I interpret Applicants' continuing interrogatories to apply continuously from their date of submission to me, and I intend these to apply likewise.)

OBJECTION. G-8 and G-9. Applicants object to Intervenor Eddleman's General Interrogatories Nos. G-8 and G-9. General Interrogatories Nos. G-8 and G-9 as demonstrated below, are repetitious, overly broad, are an undisguised attempt to compel Applicants to prepare Intervenor's own case, and attempt to circumvent the restrictions of 10 C.F.R. § 2.740(b)(2) against routine discovery of materials prepared by Applicants in anticipation of the hearing.

Mr. Eddleman has elsewhere requested "all facts" known to persons with first-hand knowledge or relied on by such persons

in providing information for answers to any of his interrogatories (General Interrogatory No. G-1(d)); all facts and/or documents used by such persons in answering his interrogatories (General Interrogatories No. G-1(e) and (f)); the identification of all documents used by witnesses or potential witnesses (General Interrogatory No. G-2(e)); all potential exhibits (General Interrogatory No. G-7(a)); all potential documentary evidence (General Interrogatory No. G-7 (c)); all documents or information which are potentially useful for cross-examination of Mr. Eddleman's or any other party's witnesses (General Interrogatories Nos. G-4(a) and (b) and G-7(b)); and "any other source(s) of information which Applicants have used to respond to any interrogatory" admitted in these proceedings. General Interrogatory No. G-3(a). Although the sum total of the interrogatories referred to above logically encompasses all the relevant and useful information available, Mr. Eddleman now seeks "all information not previously identified" which was used or relied on in any degree in preparation of Applicants' Responses and the identity of all persons who supplied any information for those responses. General Interrogatories No. G-8(a) and (b). In addition, Mr. Eddleman also demands "all information not identified" on which Applicants intend to rely in "making their case or carrying their burden of proof in this proceeding" concerning Intervenor's or any Joint Intervenors' contentions. General Interrogatory No. G-9(a). It can be fairly stated that Mr. Eddleman

wants the totality of information, documents and personal identities, no matter how tangentially related to the contentions admitted in this proceeding, of which Applicants have possession, access or knowledge. In his attempt to leave "no stone unturned" Mr. Eddleman has exceeded the permissible limits of discovery. Intervenor's General Interrogatories No. 8 and 9 do not seek to narrow the issue or selectively elicit useful and relevant information but rather are classic examples of the type of "catch-all" interrogatories that are justly rejected by the Commission and Federal judicial authorities as an abuse of the administrative process.

General Interrogatory No. G-9 clearly attempts to shift the burden of Mr. Eddleman's case preparation to Applicants. In fact, the interrogatory asks as much: "identify all information . . . which Applicants rely on or intend to use in making their case or carrying their burden of proof . . .." "There is nothing in the Federal Rules of Civil Procedure that compels either party to present its case in advance of trial." United States v. Grinnell Corporation, 30 F.R.D. 358, 362 (D.R.I. 1962). Use of discovery as a tool to substitute for a party's own investigation, necessary to present his case, or to force an early and premature presentation of an opponent's case has been condemned as an abuse of discovery. UINTA Oil Refining Company v. Continental Oil Company, 226 F. Supp. 495, 501-505 (D. Utah 1964); Fishman v. A.H. Riise Gift Shop, Inc.,

68 F.R.D. 704 (D.V.I. 1975); Central Hide & Rendering Co. v. B-M-K Corporation, 19 F.R.D. 294 (D. Del. 1956). These accepted principles of federal judicial practice have been adopted by Atomic Safety and Licensing Boards in NRC proceedings. See Duke Power Company, et al. (Catawba Nuclear Station, Units 1 and 2), ASLBP 81-463-01OL, Memorandum and Order (Rulings on Motion to Compel) (April 18, 1983) (slip op. at 3) (attempts to shift burden of case preparation to Applicants is impermissible).

Read literally, General Interrogatories Nos. G-8 and G-9 would also require the disclosure of protected and privileged material. To the extent that the interrogatories ask for trial preparation materials, Applicants also raise the objection that such materials are protected. See 10 C.F.R. § 2.740(b)(2).

G-10(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? (a)(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? (a)(iii) If your answer to (ii) is other than affirmative, please state all reasons for your answer. (a)(iv) If your answer to G-10(a)(i) above is other than affirmative, please state all reasons for your answer.

ANSWER: (a) See Applicants' Responses to General Interrogatories to G-1(e), G-1(g) and G-1(h) above.

G-10(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? (b)(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)? (b)(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 interroggatories (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. (b)(vi) If your response to (ii) above is other than affirmative, please identify each document which contains a fact not previously documented 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: (b) See Applicants' Responses to General Interrogatories G-1(c), G-1(e), G-1(g) and G-1(h) above.

Further interrogatories on Eddleman 29 and 37B (this ends 2d round); filing of these on 20 July 1983 (and filing of Applicants' 2d round to me on the same interrogatories on the same date) was agreed upon with Applicants counsel Baxter.

RESPONSES TO INTERROGATORIES ON CONTENTION 29

Interrogatory 29-9(a) In your response to interrogatory 29-1(b) (your response at page 16), you say offsite environmental air samplers "are changed once per week". (i) Does this mean once every seven days?

ANSWER: (a)(i) No. See Applicants' Response to (a)(ii) below.

29-9(a)(ii) If not exactly every seven days, does your statement mean that each such sampler is changed at least once in each calendar week?

ANSWER: (a)(ii) The samplers are changed once each calendar week, at seven day intervals, plus or minus one day due to work scheduling and sampling volume requirements.

29-9(a)(iii) If your answers to (i) and (ii) above are other than affirmative, please describe the schedule of changes in sufficient detail to predict the next change of a given sampler if one knows its last change date.

ANSWER: (a)(iii) Not applicable. See Applicants' Response to (a)(ii) above.

29-9(b) In the same response (p. 16) you say "the samples are read at the time of changing through laboratory analysis of the samples obtained." (i) Does this mean that the lab analysis is made on the spot immediately after the samples are changed?

ANSWER: (b)(i) No.

29-9(b)(ii) Please describe in detail (aa)any time limits or schedules for returning samplers to the laboratory, for performing analysis of each sampler for radioiodines, and whether the analysis done also involves any other tests done before testing for radioiodines;

ANSWER: (b)(ii)(aa) The iodine cartridges are given top priority for analysis. This is done to minimize the amount of decay that may occur and to allow an opportunity to recheck the analysis if the data appear questionable. For example, if an initial result indicates the presence of I-131, a recount three or four days later should reveal the decay indicative of I-131 if in fact that radionuclide is present. In practice, the iodine cartridge is usually analyzed within 48 hours of the time it is collected.

29-9(b)(ii)(bb) What happens if a sampler is not changed on schedule, including when it will be changed, and when its sample will be analyzed?

ANSWER: (b)(ii)(bb) If the sampler is not changed at its normal scheduled date it is changed as soon after as is practical. The analytical schedule described in (aa) above is followed in the appropriate sequence. See Applicants' Response to (a)(ii) above.

29-9(b)(ii)(cc) Exactly what analytical procedures are done for each sample, what readings are taken from each sample, and what measures are taken to avoid contamination of samples with radioiodine or other isotopes (cc-a) between the sampler and the laboratory (cc-b) in the laboratory prior to reading (cc-c) in the laboratory after reading.

ANSWER: (b)(ii)(cc) Collection is undertaken on a "set" basis, a set constituting a number of cartridges removed on the same day from specified samplers. Each radioiodine collection cartridge is removed from the sampler in the field, bagged in a plastic bag at that location and transported to the analytical laboratory. Each sample is individually bagged and appropriately labeled. Once the sample arrives in the laboratory it is logged and analytical data sheets are prepared. The sample is then transported to the counting room and placed on the gamma spectrometer for its own individual analysis. Only environmental samples, low level counting standards and other near zero activity samples are allowed into the environmental counting room. Daily counting checks assure the detection of extraneous contamination within the shift in which the

contamination would have occurred. The samples remain individually bagged at all times. They are not mixed with other sample types but stored on a set by set basis.

29-9(b)(ii)(dd) Identify all documents containing the "established and approved operations procedures for SHNPP" for such changing and analysis (your response at 16, re 29-1(b)). Please specify which procedures apply to samples to be read for radioiodines, or state that all the procedures apply.

ANSWER: (b)(ii)(dd) The following documents apply partially or totally to the sampling, analyzing, recording, and reporting of environmental radioiodines:

OPERATION	PROCEDURE
Sampling:	
Environmental Air	RC-ER-3
Environmental Program	RC-ER-31
Water Samplers	RC-ER-4
Analyses:	
Gamma Analyses	RC-ER 12
ND 4420	RC-ER-2
ND 6685	RC-ER-29
Gamma Spectrum	RC-ER-32
Beta-Gated	RC-ER-15

Quality Control & Administration

Quality Control	RC-ER-8
Control of Records	RC-ER-20
Reporting Anomalous Results	RC-ER-19
Calibration of Balances	RC-ER-21
Training Technicians	RC-ER-26

Other inplant and environmental procedures are under development, under review or are yet to be developed. The procedures above are expected to routinely undergo frequent revisions as a result of operational experiences.

29-9(b)(ii)(ee) Please answer all parts of interrogatory 29-1(c) for the offsite environmental samplers which you identify in response to 29-1(b) (See response at 16, including reprint of the interrogatory at 16-17).

ANSWER: (b)(ii)(ee) The Applicants have independently tested two air samplers using a draft calibration procedure as discussed in previous Answer 29-1(c). In addition, operational tests verified that the remaining samplers performed comparably to the two tested. These tests were performed under laboratory conditions. Final calibrations will be performed at the operating site. See also Answer to (d) below.

29-9(b)(ii)(ff) What account, if any, is taken of the halflife of Iodine-131 in (ff-a) making readings of samples (ff-b) taking samples (ff-c) interpreting the readings from samples (ff-d) comparing the readings from samples with known dates and times of radioiodine releases, according to SHNPP's "established and approved operations procedures" and (ff-e) according to any other plans for Applicants for Harris?

ANSWER: (b)(ii)(ff) Once the spectrometer computer interprets the analyzed spectrum as containing a quantity of any isotope of iodine, it calculates the radioiodine concentration, accounting for any decay that took place. The results of the computer analysis are then reviewed by the environmental supervisor or his technical representative to assure the validity of the analysis. The reviewer also looks for unusual results which might indicate a release. Any analysis results requiring a report to the NRC are immediately brought to the attention of environmental specialists who initiate an investigation into the problem and simultaneously initiate the proper reporting procedures to the NRC. The environmental specialists gather the operational data from SHNPP operations and develop the correlations between releases and the observed environmental activity. All data is available for NRC inspection and all results are interpreted in the annual Environmental Report.

29-9(c) Please identify all acceptance criteria for equipment composing the analytical system used at Harris for radioiodines (your response to 29-1(c) at 17); please identify all documents containing such criteria, and state to which part of the equipment each such criterion applies.

ANSWER: (c) The acceptance criterion for an analytical system is the requirement that it can reliably meet the Lower Limits of Detection (LLD) specified in SHNPP FSAR § 16.2.

29-9(d) Please identify the specific "NBS traceable standards", the "factor for each dry gas meter", the "quality control program" and the calibration procedure for (i) the Kurz mass flow meter (ii) the computer-based gamma radiation spectrometer, and the "control limits" for that system, and all

documents containing each of these or a description of it, (all in your response to 29-1(c) at page 17). Please also state exactly the calibration procedure(s) used for each such item of equipment, the frequency of such calibration, and the maximum error allowed for each such item and how that error is measured and how (if at all) Applicants have determined it to be an acceptable amount of error.

ANSWER: (d) Kurz Mass Flow Meter:

Each Kurz Mass Flow Meter used for calibrations is itself an NBS traceable standard. The air samplers will be calibrated annually and the Kurz meter will be recalibrated to NBS standards by Kurz Instruments, Inc. The manufacturer's NBS traceable calibration device conforms to the test numbers 213-21/190522. Kurz Instruments, Inc. supplies the SHNPP with a certificate of traceability to the National Bureau of Standards which includes the flow meter model number, serial number, technician identifier, and date of calibration.

Dry Gas Meter Factor:

The Kurz Flow Meter is attached to the environmental air sampler upstream of the filter-cartridge assembly. The Rockwell Dry Gas Meter is the last downstream component of the sampler. The flow rate indicated by the Kurz Meter is compared to the volumetric reading from the Rockwell meter. This value, "A," from the Kurz meter is divided by the value, "B," from the Rockwell meter. The result, "C," is divided by the duration of the test run. The resulting ratio, "D," is used as a correction factor for that specific sampler to correct any deviations in the recorded air volume over time.

Quality Control Program:

For air flow calibration this program is described in procedures RC-ER-3 and other procedures currently under development.

Calibration Procedures:

As described above. The frequency of calibration will be once per year. The calibrations establish the factors used for each meter and consequently the maximum error is no greater than the measurement tolerances of the Kurz Mass Flow Meter.

The Kurz Mass Flow Meter is itself an NBS traceable standard. The flow error resulting from these calibrations is extremely small compared to the allowable counting error, which is the largest contributor to error in these calculations. The allowable counting error is derived from FSAR § 16.2.

29-9(e) Please identify which criteria are selected and established by the environmental laboratory supervisor (your response to 29-1(c) at 18), for what equipment, and state for each criterion (i) the basis for its selection, and (ii) the basis for its establishment, identify the environmental laboratory supervisor who established it, state all criteria established by or for such supervisor for selection and establishment of criteria for the acceptance criteria for the equipment in the SHNPP analytical system. Please give detailed information as to each criterion used that affects or can affect the accuracy of analysis of samples for radioiodines.

PARTIAL ANSWER/OBJECTION: (e) The laboratory supervisor is

currently Dr. Dan Cahill. The criteria relevant to the detection of radioiodines are the LLD's specified in 29-9(c) above. Other criteria such as computer memory size, software, report formats, choice of manufacturer, ease of repair and a multitude of other consideratons will be used by the supervisor to select the laboratory analytical equipment.

Applicants object to the provision of any further information regarding the internal SHNPP process of criteria selection. The specific methods and procedures involved in equipment selection are irrelevant so long as the equipment meets the LLD's of the Technical Specifications. The procedure by which these factors are arrived at is completely irrelevant to the issue of Appendix I compliance, which is based on the ability of the equipment to meet the appropriate specifications.

29-9(f) Please identify each radioiodine isotope SHNPP will sample for, and the specific sampling procedures used for such each isotope. For each isotope for which you have determined a maximum error (i) in the sampling procedure (ii) between the concentration present in the environment and the result of the sampling procedure, please state that error (in percent or amount, if Applicable) and state exactly how it was derived, including all equations, calculations and assumptions you used. Please also state who derived the error estimate, when, and what qualifications each such person had to derive that estimate.

ANSWER: (f) Since the environmental samplers collect the iodine independent of its radionuclide form, all isotopes found in reactor effluents will be collected. All radionuclides of iodine emitting gamma radiation of greater than 70 kev energy

will be analyzed by the gamma spectrometer. The volumetric error is extremely small compared to the allowable counting error. See Applicants' Response to (d) above. The allowable counting error is derived from FSAR section 16.2.

29-9(g) (refers to 29-1(d), your response at 18). For each radioiodine monitor, sampler, sampling device, or detector or detection device to be used at SHNPP, please state (i) whether Applicants have independently determined the accuracy of it.

OBJECTION: (g)(i) Applicants object to this interrogatory as repetitious of Mr. Eddleman's previous interrogatory 29-1(c). Applicants response to that interrogatory, 29-1(c), was not addressed in Mr. Eddleman's Motion to Compel of July 11, 1983.

29-9(g)(ii) Whether Applicants know if anyone else, such as the National Bureau of Standards, the manufacturer, the supplier, or others has independently determined the accuracy of it.

29-9(g)(iii) For all affirmative responses to (ii) above, please identify who made the determination, and when if known.

29-9(g)(iv) For each such determination of accuracy, please state exactly how the test was done, what the acceptance criteria were, when the test was done, whether the acceptance criteria were established (aa) before (bb)after (cc)during the test, the method(s) of the test, the identity of all documents which include (dd)the test procedure (ee)the test results (ff)reprint or summary of test results, the identity of the person(s) who conducted the test, all qualifications of each such person to conduct such test, the identity of the person(s) who set the acceptance criteria for each such test, and all qualifications of each such person to establish such criteria, the limits of accuracy of the test itself, if any, and how such limits were determined (stating in detail the basis, equations and calculations used to make such determination, and any assumptions used therein), what radioactive material was used in the text, what radioiodine isotopes were used in the test, how the radioiodine present was assayed or determined (other than

by use of the device being tested), the limits of accuracy of such assay or determination, and any deviation(s) from test procedures that actually occurred during the test. This entire part applies not just to devices actually to be installed at SHNPP, but also to identical devices and models which may have been tested.

ANSWER (g)(ii)-(iv) See Applicants' Response to 29-1(c). Both the vendors and Applicants calibrate the monitors and samplers. Such calibration checks are performed before the equipment is accepted by the Applicants and during preservice and inservice inspection. Procedures used in equipment selection require that the Applicants initially specify appropriate performance and design criteria. The vendor then determines that his equipment will meet these performance and design criteria and this determination is verified by vendor testing. The vendors' approved QA/QC program is in effect for all stages of design, fabrication and testing. The Applicants then review and approve the vendors test procedures and independently verify conformance with the specified requirements prior to accepting the equipment. Details of the vendor tests employed and the names of the individuals who conducted the tests are not available. The tests vary from manufacturer to manufacturer and the test results are provided as part of the final documentation package which accompanies the equipment at the time of delivery.

29-9(h) If "contamination" in interrogatory 29-1(e) (your response at 18) were defined as "any buildup or introduction of radioactivity" would that change your answer to that interrogatory? If so, please say how the response would change.

ANSWER: (h) Yes. The monitors and samplers selected for SHNPP function by measuring or sampling the radioactivity in an effluent stream. This measurment or sampling requires that the sample measured or taken flows through the device or introduces radioactivity into the device. Applicants have difficulty with the definition offered in this interrogatory since the failure to "introduce" radioactivity into the device precludes its functioning as intended.

29-10(a) In your response to interrogatory 29-1(g) (response at 20) you say that the requested information "on in-plant monitors is not available in the form requested by the intervenor". Please identify the document(s) if any, which contain the (i) model number (ii) type (iii) manufacturer (iv) cost and (v) whether the monitor is in the possession of Applicants or its subcontractors or any of them, for each in-plant radioiodine monitor at Harris or to be used at Harris.

PARTIAL ANSWER/OBJECTION: (a) Documentation containing the information requested in (i) through (iii) is not presently available. This information will be included in vendor documentation received with the equipment. Since the in-plant monitors have not yet been shipped, this information is not available.

Applicants renew their objection to (iv) cost as a factor irrelevant to the accuracy, functioning or ability of the devices to perform their allotted tasks and, consequently, irrelevant to the issues of radioiodine release estimation or Appendix I compliance. Furthermore, Applicants objection was resisted in Mr. Eddleman's Motion to Compel Discovery re

Eddleman 29 and 37B (July 11, 1983) at 2-4. This issue is presently before the Board for determination, and inclusion of cost in this interrogatory is improper as a circumvention of the appropriate discovery dispute resolution procedures which have been invoked by Mr. Eddleman.

29-10(b) Is there any information in any subpart of (a) above that Applicants do not know? Please state which subpart(s) (e.g. model number, type, mfr. cost, whether possessed) for any affirmative response.

ANSWER: (b) See Applicants' Response to (a) above.

FIRST 29-11(a) Please answer parts (bb) and (cc) of interrogatory 29-1(h), response appears to be missing on pages 21-22 of your response.

ANSWER: (a) Concerning (bb) of interrogatory 29-1(h): See Applicants' Response to 29-1(h). With the exception of the condenser vacuum pump, direct sampling capability of the components specified is not provided for. The sampling frequency, personnel required and personal protection requirements for sampling the condenser vacuum pump effluent will be included in procedures which have not yet been developed.

Concerning (cc) of interrogatory 29-1(h):
Non-sampler monitors or detectors will include a detector for the atmospheric steam dump valves which has not yet been selected. The total number or the mix of fixed and mobile monitors or detectors has not been established. The number of

persons needed to operate a mobile device is dependent on operating procedures which are being developed.

First 29-11(b) Please state exactly how the "radiological monitory system" can "account for all radioactive releases (including radioiodine) to the atmosphere" (your response to 29-1(h) at 21-22 given that you are not able (response at 21) to sample the atmospheric steam dump valves, the steam generator relief valves, the PORVs, and the AFW pump.

ANSWER: (b) As described in FSAR section 11.5, as revised by Amendment 5, the radiation monitoring and sampling system will monitor and sample the secondary system. Direct monitoring of the releases from the main steam safety valves, atmospheric steam dump valves and steam turbine AFW pump exhaust is not required by NRC regulations and system acceptance criteria because there is a reliable alternate method of estimating releases. Sampling and monitoring is conducted on the sources for these potential release paths. Technical Specification limits must be met and operation outside (above) Technical Specifications is not considered normal operation (i.e. Appendix I not applicable). Determination of primary and secondary side activity is described in FSAR § 11.1. Secondary side activity levels are shown on Table 11.1.2-1. Applicants' will be able to account for all radioactive releases (including radioiodine) to the atmosphere. The radiological monitoring system including in-plant and effluent monitors provides the data necessary for this accountability.

The Radiological Environmental Surveillance Program provides further confirmation of the detection of radioactive materials which might leave the plant in sufficient quantities to deliver radioiodine doses to the off site populations, significant to Appendix I compliance. Critical pathways such as air and milk are sampled. Although all pathways involve large dilution factors the quantity of radioiodine required to routinely deliver a dose in excess of 10 C.F.R. 50, Appendix I guidelines is large in terms of environmental samples such as milk, air and water and is therefore easily detectable in this program.

First 29-11(c) Please describe the radioiodine sampling of the condenser vacuum pump effluent in detail, including the instrument(s) used, whether monitoring is intermittent or continuous, how you know when there is a release from the condenser vacuum pump effluent, all reliability testing of the sampling, the accuracy of the sampling as representative of the condenser vacuum pump effluent, all basis for such accuracy including all calculations and assumptions used to derive it, the method of displaying and of storing the information from such sampling, when such samples will be taken, on what schedule, and when and how they will be analyzed for radioiodines, including any time limit after sampling for getting the analysis done (i.e. how long after sampling is analysis done)?

ANSWER: (c) In compliance with NUREG-0737 and Regulatory Guide 1.97, Rev 3 for radiation monitoring, continuous Wide Range Noble Gas monitors of the type described in FSAR paragraph 11.5.2.5.11 shall be purchased for use in monitoring the condenser vacuum pump effluent. As part of that new monitor, grab sampling capabilities for particulates and iodines are provided. Representative effluent stream samples are provided

through the use of isolenetic nozzle assemblies, located in the condenser pump effluent flow stream. These nozzles shall be sized and installed in accordance with guidelines of ANSI 13.1. As described in FSAR Section 11.5 the monitor will alarm when flow activity levels are exceeded and provide control function signals as described in amended FSAR Section 11.5.2.7.2.9.

The radioiodine detectors are one part of the three stage particulate Iodine and noble gas gaseous effluent radiation monitoring skids. These units have not yet been shipped and the vendor has not yet made available calibration reports for these monitors. These reports shall accompany the equipment on shipment as part of the documentation package. The required accuracies have been identified in the equipment specifications and are shown in FSAR Table 11.5.2.-2. Conformance with the required specification accuracies shall be established through the use, during site calibration, of transfer calibration procedures which are written by the vendor and reviewed by the Applicant. The purpose of the described procedures will be to duplicate onsite the primary calibration results obtained by the vendor at his facilities. All radioactive sources used for both primary and transfer calibration are NBS traceable. As a further check of monitor accuracy the radioiodine filter cartridges which utilize TEDA impregnated charcoal, shall periodically be removed for assaying radioiodine concentrations via laboratory quality GeLi spectroscopy system.

Second-29-11(a) Do Applicants know if the radioiodine control systems and sampling/monitoring systems of the VC Summer nuclear plant are similar to those at Harris?

Second 29-11(b) Please describe the known differences between the two plants' systems with respect to radioiodine release points, control of radioiodine levels in effluents, and sampling, monitoring and testing for radioiodines.

Second 29-11(c) Do Applicants agree that VC Summer is a plant of Westinghouse design (PWR) of about 900 MWe and 2775 MWt, much like Harris in these respects?

OBJECTION: (a)-(c) Applicants' knowledge of any similarity between VC Summer and SHNPP is completely irrelevant to the issues of Appendix I compliance or the accuracy of Applicant's radioiodine release estimate. Applicants' estimate is site specific and not founded on any comparison or similarity with V.C. Summer. The radiation monitoring and sampling system at SHNPP is also plant specific. Any similarities of NSSS designs have no correlation to SHNPP's plant specific radiation monitoring and sampling systems and consequently are irrelevant to Contention 29.

Second 29-11(d) Do Applicants agree that their FSAR says VC Summer and Harris are very similar plants and compares them at some length?

ANSWER: The Applicants do not agree that the SHNPP FSAR states that the SHNPP plant and V.C. Summer plant are similar. FSAR Table 4.1.1-1 provides a comparison of similar <u>reactor</u> design parameters only.

Second 29-11(e) For any answer which is other than affirmative to (c) or (d) above, please state in detail all basis for each such answer.

ANSWER: (e) See Applicant's Responses to (c) and (d) above.

29-12(a) Concerning your answer to 29-1-k (v) and (vi) (your response at 25), do Applicants know whether NRC Staff agrees with their position (i) that direct measurement of radioiodine levels in animal thyroids is inapprorpriate (ii) as to effluent release monitoring and sampling backed up by environmental monitoring (not including animal thyroids) and employee whole body counting programs provides "the most sensitive surveillance" for potential public exposure to radioiodine?

ANSWER: (a) Current NRC Staff guidance does not include any recommendation or requirement to monitor or sample animal or human thyroids on a routine basis as a component of the Radiological Environmental Monitoring Program. (See Table 3.12-1, NUREG 0472).

29-12(b) Do Applicants believe that sampling of animal thyroids is inappropriate for environmental radioiodine monitoring?

OBJECTION (b) This interrogatory is repetitious of previous interrogatories 29-1(k)(v) and (k)(vi).

29-12(c) Do Applicants believe any NRC rule or policy forbids sampling of animal thyroids around nuclear plants as part of environmental monitoring?

ANSWER: (c) No.

29-12(d) Please state in detail all basis for your answer to (i): (b) above, and (ii): (c) above.

ANSWER: (d) The Applicants are not aware of any scientifically established mathematical relationship approved by the NRC that would allow the Applicant to estimate radioiodine doses to the public from data acquired from the analysis of animal thyroids; thus such data does not substantiate any evidence for compliance with the radioiodine guidelines of 10 C.F.R. 50, Appendix I. See Applicants' Response to (a) above.

29-13(a) With respect to radioiodine source terms for (i) liquids and (ii) gases at SHNPP, what account was taken of (aa)abnormal operations (bb)accidents (cc)Class VII accidents (dd)Class VIII accidents (ee)Class IX accidents (ff)sabotage (gg)failures of the radwaste processing systems (hh)failures of radioiodine monitoring, in calculating these source terms as described in your answer to interrogatory 29-1(p) (response at 27-28). If the answer is different for one source term, please so state and answer for both separately (gaseous and liquid) unless the answer is the same for both.

ANSWER: (a) The SHNPP source term is not based on, nor required to account for, abnormal operation, accidents or sabotage per NUREG 0017.

29-14(a) Please state in detail exactly how you (i) measure dose to individual organs (e.g. thyroid) around Harris, (ii) measure total body doses to individuals around Harris, (iii) calculate from any information you have or will collect (specify what information you use and how you will get it) each of the doses identified on page 30 of your response to interrogatory 29-1(q), specifically (answer for all 3 subparts above) (aa)gaseous effluent dose quarterly limit "a" (bb)gaseous effluent quarterly limit "b" (cc)liquid releases quarterly limit "a" to whole body (dd)liquid releases quarterly limit "a" to any organ (ee)liquid releases quarterly limit "b" to total body (ff)liquid releases quarterly limit "b" to any organ. Please use in the responses correct limits, since there may be typos (e.g. in liquid "a" 5 rem is used, but 1.5 mrem; in liquid "b" the same things are limited, but to different values -- these may be for all nuclides, and the others for radioiodines. Please clarify or correct that response as necessary before answering the above.)

ANSWER: (a) The dose to individual organs is not measured, it is calculated. The calculational method of estimating the doses to individuals around the SHNPP 1 & 2 will be described in a document which will be called an Offsite Dose Calculation Manual (ODCM). The dose calculation methodology wi l follow the guidance given in NRC Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 C.F.R. 50, Appendix I". This document will be prepared in conjunction with the Radiological Effluent Technical Specifications ("RETS") and submitted to the NRC for review and approval prior to use. The "5 rem" is a typographical error in Applicants' Response to 29-1(q)(v)(aa) and should read "5 mrem".

29-15(a) Do Applicants agree (see your response at 32) that radioiodines can and do form by decay of other nuclides which may be released into the environment?

ANSWER: (a) Yes.

29-15(b) Please list all radioiodine isotopes that can be formed by decay of any fission product(s), listing for each all of its potential parent elements; or give a reference (identify the document, pages or parts) from which this information is available. Please state which of the data requested in "this paragraph of the interrogatory" (your response at 33) is included in Lederer and Hollander's Tables of Isotopes. Please state whether this document has yet been produced to intervenor.

ANSWER: (b) The information requested is available in Lederer's Tables of Isotopes, 6th edition, pages 278 to 283. This document has not yet been produced to intervenor.

29-16(a) Do Applicants know if any of the analyses inquired about in interrogatory 29-1(t) have been performed by the vendor(s) of any components identified in response to interrogatory 29-1(s)?

29-16(b) If answer to (a) is affirmative, please identify each such component, its vendor, and which of the tests or analysis have been performed by that vendor on that component.

ANSWER: (a)-(b) The analysis identified may be included among those tests and analyses described in the specifications discussed in Applicants' Response to interrogatory 29-16(c).

Such analyses if included among those required, may be prepared by the vendor and/or his material subsuppliers.

The applicable design specifications and associated quality assurance controls assure material selections appropriate for use in the SHNPP as described in Applicants' Response to 29-24.

29-16(c) Please state which (i) design basis (ii) conditions (iii) performance criteria were specified by Applicants for each such component identified in response to interrogatory 29-1(s). Please state exactly what specifications were used to the vendor, for each such component (where answer is same for an identifiable group of components, please so state).

29-16(d) Please identify each NRC requirement each (i) design basis (ii) condition or set of conditions (iii) performance criterion specified by Applicants, for each component identified in response to 29-1(s), is designed to meet. Please state all basis that it does meet or contribute to meeting that NRC requirement.

29-16(e) Please identify each applicable performance standard or functional requirement (see your response at 37) which each (i) design basis (ii) condition or set of conditions (iii) performance criterion identified above is to meet, and all basis for Applicants' belief that it does meet it (for each). If it does not meet it, so state.

ANSWER AND OBJECTION: (c)-(e) The design basis, conditions and performance criteria are specified in the Applicants' vendor specifications and the SHNPP FSAR.

Applicants' object to the provision of purchasing information contained in Applicants' vendor specifications. This information is not available in the form intervenor requests and generally contains highly individualized parameters which constitute commercially sensitive data. In addition, these specifications may undergo modification as a result of vendor equipment refinements and/or availability. Furthermore, these intermediate specifications are irrelevant to the issue of Applicants' compliance with Appendix I. This compliance is dependent on the ability of the selected equipment to conform operation of SHNPP to the Technical Specifications contained in FSAR Section 16.2.

29-17. In response to interrogatory 29-2(g), you state Applicants compared on-site meteorological data with information from the Raleigh-Durham airport and other cooperative weather stations in the area (ref. FSAR section 2.3) "to assure that the collected onsite data is representative of the collected onsite data." (Ref your response, p. 40). (a) Was a line omitted from this part of your response, or some other error made in it? If so, please provide a corrected response.

ANSWER: (a) The error made in this response was typographical in nature. The correct response which was prepared is as follows:

"The on-site meteorological data was compared with information from the Raleigh-Durham airport and other cooperative weather stations in the area (see references to section 2.3 of the SHNPP FSAR) to assure representativeness of the collected on-site data, but only the SHNPP meteorological tower information was utilized in computing estimates of radioiodine concentrations in the environment during Harris operations."

29-17(b) What does the statement quoted above mean?

ANSWER: (b) The above statement means that information from various other sources was consulted, reviewed, and analyzed against that collected from the SHNPP on-site meteorological system to determine if onsite data was significantly different from that observed at surrounding observations stations, and if so, was there a potential explanation as to the reason for such differences.

29-17(c) What did you use the RDU airport data for, when you compared it with Harris plant site data?

ANSWER: (c) Since the Raleigh-Durham airport provides a long-term record such as 30-year normal values, the comparison of the onsite meteorological data with that collected at the

airport provided a basis for assuring that the data used in dispersion analysis was representative of conditions one might expect to find in the area.

29-17(d) Was the data from other cooperative weather stations used in the same way as RDU airport data, in comparison with SHNPP data? If not, what use was made of it?

ANSWER: (d) The cooperative weather stations provided temperature and precipitation data, from which comparisons could be made to assure that the site information was similar in nature to surrounding reporting stations within variations one might expect to find for each parameter observed. The data from the cooperative stations can be used to reference normal observations or as a one-on-one comparison of specific weather events to determine site variability.

29-17(e) Why were low-level meteorological data only used in computing dispersion from SHNPP? Please state in detail all reasons for your answer, all supporting documentation and opinions of experts.

ANSWER: (e) The lower level wind data from the SHNPP meteorological monitoring station is representative of those conditions associated with a ground level release of air borne materials. Additionally, through frictional effects, winds tend to "drag" on the rough ground surface and consequently, the upper sensor level on the SHNPP tower is not utilized because it would indicate a greater velocity. This cross-sectional profile of wind velocities follows a well

established power law found in most meteorology texts or on page 278 of the following:

Introduction to Theoretical Meteorology, Seymour L. Hess, Professor of Meteorology, Florida State University, Holt, Rinehart and Winston, New York, 1959.

Since wind velocities will be less by using the lower wind level of the SHNPP tower and since all equations of dispersion contain the wind velocity term in the denominator of the equation, utilizing the lower level wind velocities will produce higher, more conservative dilution values than using the upper level wind measurements.

29-17(f) Do dispersion estimates for radioiodines from SHNPP take account of rainout? Of precipitation in general? Of precipitation of any type (please list each such type).

ANSWER: (f) No.

29-17(g) For all affirmative answers to any part(s) of (f) above, please state in detail, with equations, assumptions, calculations, and authorities therefor, how the model takes account of each form of precipitation for which your answer in (f) above was affirmative.

ANSWER: (g) Not applicable.

29-18. (Refers to your answer to 29-3(e) on pages 44-45 of your response): (a) Are there any radioiodine release pathways (i) to atmosphere (ii) to cooling tower blowdown (iii) to the Harris reservoir, which can occur when the Harris plant is not operating under normal conditions? (b) Please identify each such release pathway for which Applicants (i) have performed any analysis or study (ii) have not performed any analysis or study.

OBJECTION: (a) and (b) Applicants object to this interrogatory which is beyond the scope of Contention 29; the issue of Applicant Appendix I compliance under normal operations. By definition, an interrogatory based on an assumption that "the Harris plant is not operating under normal conditions," does not fall within the permissible bounds of discovery on Contention 29.

First 29-19(a) Have Applicants or anyone else you know of performed any study of the deposition of radioiodines on tobacco leaves (including the hairs thereof)?

ANSWER: (a) No.

First 29-19(b) If so, please identify each such study and all documents containing it.

ANSWER: (b) Not applicable.

First 29-19(c)-(e) below. Have Applicants considered or studied radioiodine exposure to tobacco workers (i) in the fields (ii) in warehouses (iii) in cigarette or cigar manufacturing? If so, please identify each such study and to which groups of workers it applies, identifying all documents in which each such study is contained.

ANSWER: (c) See Applicants' Response to (c)-(e) below.

First 29-19(d) Is tobacco analyzed for radioiodine content in the Harris environmental monitoring program? If not, why not?

ANSWER: (d) See Applicants' Response to (c)-(e) below.

First 29-19(e) Have Applicants or anyone else you know of made any study of radioiodine effects on smokers, due to radioiodine in tobacco, or due to smoking combined with

exposure to radioiodine in air? If so, please identify each such study and all documents containing it.

ANSWER: (c)-(e) Applicants know of, and have conducted, no studies on the subject of unique exposures to tobacco workers in fields, warehouses or the manufacturing of tobacco products. Furthermore, the dose pathway for radioiodines through tobacco to man involves (1) long delays (i.e. months to years) from the time of deposition in the field until the time of consumption and such nominal quantities of I-131 as may be deposited will go through greater than 10 half-lives prior to consumption and (2) the industrial processes of cutting, mixing, blending and manufacturing provides great dilution with other unaffected tobacco such that further reduction in the concentration of any radioiodines would occur. The curing method for the type of tobacco grown in the SHNPP environs uses elevated temperatures to kiln dry the tobacco. This would also drive off the volatile radioiodines that may have been deposited. Instead of sampling tobacco, broad-leaf food crops are sampled that are consumed at harvest with no dilution. The Applicant considers the latter sample material the more appropriate surveillance sample media compared to tobacco.

Second-29-19(a) In your response at 46-47 (re 29-3(1), you give a partition coefficient between water and air as 10,000 to 1: (i) is this ratio correctly described as a partition coefficient? If not, please give the term for it. (ii) Where do you get this ratio of 10,000 to 1 (water to air) for radioiodines? Please identify all documents which you rely on for this number, and describe in detail (or reference specifically) how it is calculated and give all data and assumptions used in

such calculation. (iii) Is the ratio of 10,000 to 1 (water to air) the same for all radioiodine isotopes? Please give detailed reasons and references for your answer, including identification of all documents, opinions, calculations and assumptions you rely on in making your answer.

ANSWER: (a) The ratio was established and analyzed in EPRI 1269.

29-20(a) Please identify each document, computer run, workpaper or other document (including electronic records, computer data) which you used in actually calculating the radioiodine source term for (i) gaseous (ii) liquid releases from Harris.

ANSWER: (a) The calculation of the SHNPP 1 & 2 radioiodine source term was made by using the NUREG 0017 GALE (gaseous and liquid effluents) computer code. The actual computer run is part of EBASCO's documentation of the SHNPP 1 & 2 routine operation source term and dose calculation file.

29-20(b) What operating conditions did you assume in making each calculation asked about in (a) above? Please specify all such conditions, e.g. filter efficiency, sensitivity of monitors/detectors, radioiodine levels in coolant, radioiodine levels in containment atmosphere, percent or amount of failed fuel rods, efficiency of liquid waste-processing steps in removing radioiodines, etc., which are used or apply in making each such calculation.

ANSWER: (b) The assumptions used and parameters necessary to calculate the liquid and gaseous radioactive releases are given in the SHNPP FSAR, Tables 11.2.3-2, respectively.

29-20(c) Have Applicants analyzed or collected any data on the percent or amount of the time that other nuclear plants in operation actually do meet each condition assumed in your calculation for Harris?

ANSWER: (c) Applicant has not collected data on the amount of time that other nuclear plants meet the conditions assumed in the calculation. However, such an analysis has been performed by the NRC in support of NUREG-0017, which describes the calculational method used by Applicants. The NRC has an ongoing program to continually assess new data to determine if changes to the standard calculational method are appropriate.

29-20(d) If answer to (c) is affirmative, please identify all documents which contain such data, state for each what data it contains, and whether Applicants have used that data in any analysis or comparison or review of their source term(s) for Harris radioiodine releases, giving which source term it was used for.

ANSWER: (d) Not applicable.

29-21. (Refers to answer to 29-3(o) (iv) at page 49 of your response) (a) Please supplement your answer to interrogatory 29-3(o)(iv) to state what "commonly accepted engineering principles" were used in making this calculation.

ANSWER: (a) The calculation of the concentration of radionuclides released in the SHNPP reservoir is based on the assumptions that the radionuclides 1) will uniformly mix in 80-percent of the reservoir water and 2) will reach equilibrium concentration. From these fundamental assumptions, the equation which is used to calculate the reservoir concentration has been derived using the principle of conservation of mass. In descriptive terms, this principle states that, for example, the rate of change of radioactivity concentration in the reservoir is equal to the rate of its introduction minus the rate of its disappearance.

29-21(b) Please state exactly how the calculation was made, including all equations, assumptions and principles used in making it. Your answer should be sufficiently detailed to enable duplication of the calculation.

ANSWER: (b) The change of activity with respect to time is given by:

$$\frac{dA_i}{dt} = P_i - x_i A_i \qquad (1)$$

A = activity of radionuclides in reservoir, Ci

P = release rate of radioactivity into the reservoir, Ci/yr

x = disappearance rate constant of radionuclides, yr^{-1}
(assumed to be radioactive decay constant)

i = radionuclide index

The activity of radionuclides, A_i, in the reservoir at any point in time, t, is given by the integral of Equation 1:

$$A_i = \frac{P_i}{x_i}\left[1 - e^{-x_i t}\right] \qquad (2)$$

for large values of t denoting that equilibrium has been reached, Equation 2 becomes:

$$A_i = \frac{P_i}{x_i} \qquad (3)$$

The radionuclide reservoir concentration is obtained from Equation 3 as follows:

$$C_i = \frac{A_i}{.8V} \qquad (4)$$

where:

C = radionuclide concentration in reservoir, mCi/ml

V = reservoir volume, ml

.8 = reservoir mixing factor

29-21(c) Has CP&L made available the Ebasco calculation file referred to in your response to 29-3(o)(iii) for inspection and copying? When? Where?

ANSWER: (c) No.

29-21(d) Please identify which specific calculation file is referred to in your answer to 29-3(o)(iii).

ANSWER: (d) The calculation of radionuclide concentrations in the SHNPP reservoir is part of EBASCO's documentation of the SHNPP 1 & 2 routine operation source term and dose calculation file.

29-22(a) Do the statements about "normal operation" given in response to interrogatories 29-4(a) through (e) apply to your calculation of the radioiodine source terms for Harris?

ANSWER: (a) This interrogatory implies a relationship between the emergency categories contained in Mr. Eddleman's previous interrogatories 29-4(c) through (d) and normal operations. Applicants Response to 29-4(a) through (d) established that no

(d) established that no such relationship exists. In addition, the basis of previous interrogatory 29(e), condenser leakage, was also shown by Applicants' Response to have no relationship to normal operations.

29-22(b) If answer to (a) above is other than affirmative, please identify each source term for which "normal operation" is defined or taken as different, and explain in detail each difference with each answer (to 29-4(a) through (e)) for each such source term.

ANSWER: (b) Not applicable.

29-22(c) In your response to 29-4(f) (resp. at 53) you say "there is no primary to secondary leakage value which is considered to be normal operation". (i) Do you consider operation outside the Technical Specifications (TS) for Harris re primary to secondary leakage to be normal operation? Please give all reasons for your answer and all facts which you believe support it.

ANSWER: (c)(i) The integrity of the primary coolant system is not expected to be breached. Ideally then, normal operation would preclude the presence of system malfunctions characterized here by primary to secondary leakage. But considering the large number of tubes in the steam generators, it is possible that small leaks may develop during the course of plant operation. The SHNPP 1 & 2 Technical Specifications have placed a limit on the allowable primary to secondary leakage. This limit is the upper range of the tolerance under which it has been determined that the plant can safely operate. Consequently, operation outside (above) the Technical Specifications for primary to secondary leakage is not considered to be normal

operation. Chapter 15 of the SHNPP FSAR describes several events involving primary to secondary leakage greater than the Technical Specification limits. These events have all been categorized as accidents.

29-22(c)(ii) Given that there are 3 steam generators at Harris, do the Technical Specifications in fact allow 1500 gallons per day primary to secondary leakage for Harris? Please explain your answer and cite all documents and opinions you rely on in making it.

ANSWER: (c)(ii) No. The SHNPP Technical Specifications will limit the primary to secondary leakage through all steam generators to a total of 1 gallon per minute.

29-22(c)(iii) What is the maximum total primary to secondary leakage (through all pathways) that Harris is allowed to have and still (aa)continue operation (bb)continue operation at full power (cc)continue operation at a reduced power level -- please specify that level (dd)continue to increase power level; all under your technical specs for Harris or applicable procedures. Please identify each such procedure and what response(s) it applies to and how it affects such response, in this subpart (iii).

ANSWER: (c)(iii) The only interface between the reactor coolant system and the secondary system is at the steam generators. Technical Specification 3.4.6.2 of the SHNPP FSAR gives the applicable operation modes.

29-23(a) In your response to interrogatory 29-4(h) (resp. at 54) you use the term "1.0 microcurie per gram dose equivalent I-131". Please define this term in more detail.

ANSWER: (a) The definition of dose equivalent I-131 is given in section 1 of the SHNPP Technical Specifications which are contained in section 16.2 of the SHNPP FSAR.

29-23(b) Does the term quoted in (a) above mean "enough I-131 to give a dose equivalent to 1 microcurie (from radioiodine) per gram of primary coolant"?

ANSWER: (b) No.

29-23(c) Does the term quoted in (a) above mean "enough I-131 to produce a dose equivalent to 1.0 microcurie, per gram of exposed material"?

ANSWER: (c) No.

29-23(d) If your answer to (b) or (c) above is other than affirmative, please explain your answer and the reason(s) for it in detail.

ANSWER: (d) See Applicants' Response to (a) above.

29-23(e) How often is the I-131 content of primary coolant to be sampled at Harris? Please give any applicable schedule(s).

ANSWER: (e) Primary coolant I-131 content will be determined in accordance with the schedule given in FSAR Section 16.2, Table 4.4-4.

29-23(f) Is every sample of primary coolant to be tested for I-131? If not, which ones will be?

ANSWER: (f) No. Only the samples obtained in accordance with Table 4.4-4 above.

29-23(g) Is there any radioiodine isotope other than I-131 for which there is any limit in primary coolant at Harris in light of your answers to interrogatories 29-4(h), (j), (k)?

ANSWER: (g) The Technical Specification limit on primary

coolant concentration is expressed only in terms of dose equivalent I-131. This term accounts for all other radiologically significant radioiodine isotopes present in the reactor coolant. See Applicants' Response to (a) above.

29-23(h) If answer to (g) is affirmative, identify each such isotope and the applicable limit.

ANSWER: (h) Implicit consideration is given to I-132, I-133, I-134 and I-135. See Applicants' Response to (a) above.

29-23(j) In your answer to (response at 56) you say there are limited conditions for operation which are placed on the actual coolant concentration: (i) is this a concentration of (aa)I-131 (bb)any other radioiodine isotopes (please list each such)?; (ii) exactly what limited conditions for operation are imposed, and what levels of each radioiodine isotope inquired of in (i) above triggers or requires each such condition? Please identify all documents which contain this information, and state whether the limited conditions for operation are part of the Harris tech specs (if not all are, which are?). (iii) is "limited conditions for operation" the same as an "LCO" or a "limiting condition for operation"? Which?

ANSWER: (j) The limiting conditions for operation ("LCO's") which are placed on the actual coolant concentration are given in section 16.2 of the SHNPP FSAR. The LCO's are contained in FSAR § 16.2. The term "limited conditions" should read "limiting conditions".

29-23(k) Is the Harris plant procedure for (i) determining values of fuel defects (ii) determining coolant concentration for radioiodine(s) (iii) correlating fuel defects and coolant concentrations (aa)for radioiodines (bb)for any nuclides or nuclide, written yet?

ANSWER: (k) No.

29-23(l) Is a procedure of comparing known fuel defects to primary coolant fission product inventory used at the H.B. Robinson nuclear plant?

OBJECTION: (l) Procedures at H.B. Robinson are irrelevant to the issues of the accuracy of Applicants' radioiodine release estimates and Appendix I compliance.

29-23(m) If response to (l) above is affirmative, please identify this procedure and all documents containing (i) the procedure (ii) the method used at Robinson for finding defects in fuel (iii) the method used at Robinson for enumerating the defects in fuel rods (iv) the method used at Robinson for determining radionuclide levels in primary coolant.

OBJECTION: (m) See Applicants' Objection to (l) above.

29-23(n) Is there any limit at all for Harris on the fuel cladding defect fraction?

ANSWER: (n) As previously stated in the response to interrogatory 29-4(n) there is no Technical Specification limit on the fuel cladding defect fraction.

29-23(o) Is there any limit for Brunswick on the fuel cladding defect fraction?

OBJECTION: (o) Any limits or occurrences at the Brunswick plant are irrelevant to the issues of the accuracy of SHNPP's radioiodine release estimate and Appendix I compliance.

29-23(p) If response to (o) is affirmative, was such limit imposed by NRC Staff (i) in early 1979 (ii) at any other time?

OBJECTION: (p) See Applicants' Objection to (o) above.

29-23(q) What method(s) were used at Brunswick to inspect fuel for defects prior to loading it into the core (i) between 1974 and 1979 (ii) between 1974 and the present?

OBJECTION: (q) See Applicants' Objection to (o) above.

29-23(r) How do the methods for inspection of fuel for defects at (i) Robinson (ii) Harris differ from the methods used at Brunswick?

OBJECTION: (r) See Applicants' Objection to (o) above.

29-23(s) Do Applicants agree that their fuel cladding defect fraction at Brunswick has been as high as (or above) (i) 1% (ii) 2% (iii) 5% (iv) 10% (v) 13% (vi) 15% (vii) 17% (viii) 20% (ix) 22% (x) 25% (xi) 27% (xii) 29% (xiii) 30% (xiv) 33% (xv) 35% at Brunswick.

OBJECTION: (s) See Applicants' Objection to (o) above.

29-23(t) Have Applicants ever had to (i) reduce power (ii) shut down (iii) remove fuel at Brunswick due to excess failed fuel or due to radioactive releases due to failed fuel rods?

OBJECTION: (t) See Applicants' Objection to (o) above.

29-23(u) Please specify the time and cause of each such instance of (i) power reduction (ii) shutdown (iii) fuel removal at Brunswick due to (aa)excess failed fuel (bb)failed fuel levels (cc)radioactive releases due to failed fuel (dd)NRC requirements or restrictions related to failed fuel.

OBJECTION: (u) See Applicants' Objection to (o) above.

29-23(v) In what respects other than inspection of new fuel pre-loading, do procedures for Brunswick and Harris re failed fuel differ? Please list each such and explain it.

OBJECTION: (v) See Applicants' Objection to (o) above.

29-23(w) Is there any way to be certain of the amount of fuel cladding in a given bundle of fuel for Harris that will become defective, which can be used prior to loading of fuel into the Harris reactor?

ANSWER: (w) No.

29-23(x) If answer to (w) is affirmative, please describe the method in detail and state why (if at all) it would not be applicable to testing fuel used at Brunswick, before loading fuel there.

OBJECTION: (x) See Applicants' Objection to (o) above.

29-23(y) Please identify all documents containing information requested in (x) above, including any documents as to why such testing method is not used at Brunswick, description of the method, results of its use.

OBJECTION: (y) See Applicants' Objection to (o) above.

29-23(z) Can Applicants specify any maximum fuel cladding failure fraction for Harris (i) as a specification in purchasing nuclear fuel for it (ii) for operation? If so, please give all details of each such specification.

ANSWER: (z) The fuel is warranted, however, no maximum fuel cladding failure fraction is specified.

29-24(a) Please supplement your answer to interrogatory 29-5 by identifying which (i) industry standards (ii) guidance from the NRC in which regulatory guides, is used in the (aa)design (bb)manufacturing (cc)testing, and will be used per procedure or commitment in (dd)operation of Harris, for the items of equipment asked about in 29-5(a).

ANSWER: (a) Applicable industry standards and applicable NRC regulations and guidance documents to be addressed by the equipment vendor are discussed in Applicants' Response to

29-16(c). In addition to these documents the FSAR details the Applicant's compliance with applicable NRC regulations and guidance. See also Regulatory Guide 1.140.

29-24(b) Have Applicants verified compliance with any such (i) standard (ii) guidance from NRC, for any (aa)manufacturer (bb)designer (cc)test or tester, of any equipment inquired about in Interrogatory 29-5(a), i.e. radioiodine filters, traps and other component intended or expected to remove radioiodines from Harris effluents?

29-24(c) For each affirmative answer to each subpart of (b) above, please list each such verification, who did it, when, by what method, and identify all documents showing such verification, its method, or data or information verifying such compliance.

ANSWER: (b) and (c) Each applicable design specification contains Quality Assurance requirements appropriate to the equipment, and specifies the test reports and other supportive documentation which demonstrate compliance with applicable industry code standards and design specification requirements. See, Applicants' Response to 29-16(c) above. These records are submitted by the equipment suppliers and/or his subsuppliers. The retention of these submittals is consistent with the SHNPP committments contained in the FSAR and other appropriate documents. The Applicants have established and implemented a Quality Assurance program which requires verification by the equipment supplier (as part of his accepted QA program) that all equipment supplied by him or his subsupplier is in accordance with the design specification and appropriate industry standards. The Applicants have also established and

implemented, as part of this program, measures which assure that the supplier has implemented said program. In addition, the Applicants require that the appropriate portion of such equipment undergoes inspection at the supplier's facility and at the plant location by the Applicants.

29-25(a) Re your response to 29-6(f)(iii)(x) at page 63, please supplement your answer to state what historical data, from what plants or other sites, Applicants used in determining the normal and abnormal range of environmental conditions postulated to occur at the "appropriate equipment locations", and explain how this data was used in postulating such ranges, including all calculations made in such postulations.

ANSWER: (a) No specific data from other plants or other sites was used in determining the normal and abnormal range of environmental conditions. Reference to historical data refers to on-site and area meteorological data.

29-25(b) Do Applicants know the (iii) component manufacturers (iv) component dimensions (xiii) design life (xiv) replacement schedule (xv) personnel exposures (xvi) internal and external radiation exposures (from replacement of equipment, as is (xv)) for each component inquired about in interrogatory 29-6(f)? (subpart numbers from 29-6(f) are used here in this part (b) for easy reference).

OBJECTION: (b) Applicants object to this interrogatory as being repetitive with the sections of Interrogatory 29-6(f) which were objected to in the previous round. These objections were resisted by Mr. Eddleman's Motion to Compel Discovery re Eddleman 29 and 37B, dated July 11, 1983 and the dispute is currently before the Board. An interrogatory based on

repetitious requests and referring to issues which are currently before the Board is improper and objectionable.

29-25(c) Please supplement your answer to 29-6(f) with an answer to subparts (xvii) and (xviii) to identify the documents containing failure rates estimated by vendors of this equipment.

ANSWER: (c) The Applicant does not possess failure rate data. The vendors determine component replacement schedules which are made part of the final documentation package submitted by the vendors. In developing these replacement schedules the vendor relies on past operating experience in conjunction with projected service conditions.

29-25(d) Please identify the vendor-estimated failure rate for each item of equipment asked about in interrogatory 29-6(f) and state the rate.

ANSWER: (d) See Applicants' Responses to (b) and (c) above.

29-26(a) Please explain fully why you think (iii) component manufacturers (iv) component dimensions (xiii) design life (xiv) replacement schedule (for components) and (xv) radiation exposure to persons replacing such components, and (xvi) internal and external radiation dose to persons replacing such components, are irrelevant to Eddleman Contention 29 for discovery purposes.

29-26(b) Do you believe or contend that any of the above items (all of which apply to components used to control radioiodine releases from the plant (Harris)) are (sic) information which cannot lead to admissible evidence re Eddleman 29?

29-26(c) If answer to (b) above is affirmative, please state the basis for your belief for each item in (a) above to which that belief applies. Please explain the basis for anything you "contend" in the same way you are asked to explain the basis of your beliefs.

OBJECTION: (a)-(c). See Applicants' Answer to Intervenor Eddleman's Motion To Compel Discovery re Eddleman 29 and 37B at 9-11 (July 26, 1983) and Applicants' Objection to 29-25(b) above.

29-27(a) Is it true that the "minimum configuration of radioiodine trapping, absorbing and filtering devices at Harris which is allowed during normal operation" is, none?

ANSWER: (a) Yes.

29-27(b) If response to (a) above is other than affirmative, please explain in detail how your answer is consistent with response to 29-7(a) on pages 63-64 of your response.

ANSWER: (b) Not applicable.

29-27(c) What is the minimum operable configuration of the gaseous radwaste treatment system at Harris under which normal operation of the plant is allowed?

ANSWER: (c) The required operable configuration of the gaseous radwaste treatment system at Harris is as yet undefined. This is established in the Offsite Dose Calculation Manual which is yet to be developed and approved. See Applicants' Response to 29-14 above.

29-27(d) Is there any Technical Specification for Harris with respect to ability to trap or absorb radioiodines before they are released to the environment?

ANSWER: (d) No.

29-27(e) If answer to (d) is affirmative, please list each such Technical Specification and identify all documents containing each.

ANSWER: (e) Not applicable.

29-27(f) Is there any limiting condition for operation or LCO for Harris at present (or presently written) which involves:

(i) radioiodine releases as measured at release points,

(ii) radioiodine present in the environment,

(iii) radioiodine present in the thyroids of of animals,

(iv) radioiodine present in the thyroids of human around the plant,

(v) radioiodine, excluding medical exposures, in thyroids of humans around the plant?

ANSWER: (f) (i) Yes.

(ii) Yes.

(iii) No.

(iv) No.

(v) No.

29-27(g) If answer to any part of (f) above is affirmative, for each such part please list the LCO or condition, the radioiodine level(s) involved in it, what part of (f) they apply to, and how they are measured, and identify all documents containing the LCO or condition or its basis.

ANSWER: (g) Regarding (f)(i) and (ii): LCO's related to, or affecting Appendix I compliance are:

(1) Liquid:

10 C.F.R. Part 50, Appendix I radioiodine levels in liquids:

LCO-Not to exceed during any calendar quarter:

1.5 mrem to the total body

5 mrem to any organ

Not to exceed during any calendar year:

3 mrem to the total body

10 mrem to any organ,

as calculated according to the Offsite Dose Calculation Manual (ODCM) as measured from representative samples liquid effluent releases from site analyzed by a gamma spectrometer. See FSAR section 16.2 at page 3/4 11-5.

10 C.F.R. Part 20, Appendix B, for short term releases, radioiodines as measured at the release points in liquid effluents:

LCO - Radioiodine levels not to exceed concentrations specified in 10 C.F.R. 20, Appendix B, Column 2 of Table II, as measured by analysis of representative samples of the effluent using a gamma spectrometer. See FSAR section 16.2 at page 3/4 11-1.

(2) Gaseous:

10 C.F.R. 50, Appendix I radioiodine levels in gaseous effluents released from the site:

LCO is during any calendar quarter,

less than or equal to 7.5 mrem to any organ, and during any calendar year:

less than or equal to 15 mrem to any organ,

10 C.F.R. Part 20, Appendix B radioiodine levels in gaseous effluents released from the site:

LCO is less than or equal to 1500 mrem/yr to any organ, as calculated by the ODCM and measured by gaseous iodine effluent monitors. See FSAR section 16.2 at page 3/4 11-8.

as calculated according to the ODCM and measured by radioiodine effluent samplers analyzed by a gamma spectrometer. See, FSAR section 16.2 at page 3/4 11-13.

29-27(h) What is the minimum operable configuration of the ventilation exhaust treatment system at Harris under which normal operation of the plant (e.g. full power operation) is allowed?

ANSWER: (h) The required operable configuration of the ventilation exhaust treatment system will be established in the Offsite Dose Calculation Manual (OCDM). See Applicants' Response to (c) above.

29-27(j) What is the minimum operable configuration of the liquid radwaste treatment system at Harris under which normal operation is allowed?

ANSWER: (j) The required operable configuration of the liquid radwaste treatment system will be established in the Offsite Dose Calculation Manual (OCDM). See Applicants' Response to (c) above.

29-27(k) Please identify all documents giving the minimum configuration(s) inquired about in parts (c), (h) and (j) above, identifying which system(s) they apply to. Please explain in detail, including any calculations you have made, and all assumptions you use, what the radioiodine removal capability of each such minimum configuration is, how that capability is figured or arrived at by you, and how that capability ensure compliance with (i) Section II.B of 10 C.F.R. 50 App I, (ii) Section II.C thereof (iii) Section II.D thereof (iv) 10 C.F.R. 50.36a (v) 10 C.F.R. 50.36(a) (vi) General Design Criterion 60 of 10 C.F.R. 50 Appendix A.

ANSWER: (k) The calculations requested will be contained in the Offsite Dose Calculation Manual, not yet developed. See Applicants' Response to 29-14 above.

29-27(l) For each part of your explanation in response to (k) above and its subparts (i) through (vi), please explain exactly how you assure compliance with each such requirement, and identify all procedures you use to do so, and all documents containing each such procedure.

ANSWER: (l) See Applicants' Response to (k) above.

29-27(m) Has NRC Staff approved compliance for Harris with all of the sections of 10 C.F.R. 50 and its appendices cited by you in response to Interrogatory 29-7(a) (and reproduced or set forth in part (k) above)?

ANSWER: (m) The results of NRC Staff considerations are

contained in the SER and DES. The NRC Staff has concluded that Applicants comply with Appendix I. See DES at 5-32 and Appendix D. Applicants have committed to compliance with 10 C.F.R. § 50.36a and the appropriate Technical Specifications are being developed and will be reviewed by the NRC.

29-27(n) Please state which parts NRC has approved compliance with, if any. Please identify all documents in which NRC approval of such compliance is given, and for each such document, identify all CP&L documents NRC Staff was given by Applicants for making such determination.

ANSWER: (n) See Applicants' Response to (m) above.

29-27(o) Exactly what are the "appropriate portions of these (gaseous radwaste and ventilation exhaust treatment) systems" to which you refer in your response to 29-7(a) on page 64 of your response?

ANSWER: (o) The appropriate portions of the gaseous radwaste treatment systems referred to in the response to interrogatory 29-7(a) pertain to the filtration section of the building ventilation exhausts and other systems used to absorb and contain airborne iodine. The specific configuration of these portions will be contained in the ODCM, See Applicants' Responses to (c), (h) and (j) above.

29-27(p) Exactly how does each "appropriate portion" of each such system limit radioiodines, and to what level does each such portion limit radioiodines passing through it (or output from it)?

ANSWER: (p) Specifically, the systems discussed in (o) above are: the Reactor Auxiliary Building Normal Ventilation System,

the Condensor Vacuum Pump Effluent Treatment System, the Containment Atmosphere Purge Exhaust System and the Airborne Radioactivity Removal System.

Removal of airborne iodine is done by High Efficiency Particulate Air (HEPA) filters and charcoal adsorbers. The design details and the removal efficiency of the various filter trains of the above listed systems are given in tables of Section 9.4 of the SHNPP FSAR.

29-27(q) Which of the "appropriate portions" of each system is required to be operable when the Harris plant is (i) operating at any power level above zero (ii) in hot standby (iii) in cold shutdown (iv) in hot shutdown (v) operating at full power (vi) operating at a specified power level less than 100% as given by any LCO for the plant, including those identified in response to parts (f) or (g) above? Please list each such portion for each condition, identifying when the portions required for more than one condition listed above-(i) thru (vi)--are the same.

ANSWER: (q) All. See Technical Specifications 3.11.2.4 and 3.11.1.3.

29-27(r) Are any other parts of (i) the gaseous radwaste treatment system (ii) the liquid radwaste treatment system at Harris required to be operable when the plant is operating under any of the 6 conditions listed under (q) above as (i) thru (v)?

ANSWER: (r) No.

29-27(s) If response to (q) is affirmative, please list each such part, and the conditions or condition under which it is required to be operable at Harris.

ANSWER: (s) Not applicable.

29-27(t) On what schedule is the operability (ii) functioning (iii) compliance with applicable performance standards, to be verified for each component of the (aa)gaseous radwaste treatment system (bb)liquid radwaste treatment system (cc)ventilation exhaust treatment system, at Harris, which component is involved in or necessary to the trapping, removal or isolation or reduction of radioiodines before they are released to the environment? Please list the schedule for each such component or identify document containing this information.

ANSWER: (t) The liquid radwaste treatment system shall be verified to be operable on a schedule given in Technical Specification 3/4. 11.1.3. The gaseous radwaste treatment system and the ventilation exhaust treatment system shall be verified to be operable on a schedule given in Technical Specification 3/4. 11.2.4.

29-27(u) Are any of the parts identified in response to (r) above necessary to remove radioiodines at Harris?

ANSWER: (u) Not applicable.

29-27(v) For any affirmative response to (u) above please list each such part and explain how it is necessary to removal of radioiodines at Harris (from effluents or streams going to effluents or to waste processing, filters etc.). Please identify all documents containing information about how each such part (or all of them or some portion(s) of them) are needed to allow the removal of radioiodines. (e.g. blowers are needed to move the gaseous streams through the filters, see document XXX.

ANSWER: (v) Not applicable.

29-27(w) Is there any verification identified in (or asked about in) (t) above which would, if not made (i) require Harris to shut down (ii) require Harris to reduce power or come into a LCO (iii) require Harris to go to hot standby within a certain time if not verified operable?

ANSWER: (w) No.

29-27(x) Please identify each verification for which your answer to any part of (w) above is or would be affirmative, and the condition (i thru iii above, or other) which it requires to be imposed on Harris if it (i) has not been timely made or (ii) has not been made.

ANSWER: (x) Not applicable.

29-27(y) On what schedule is each component or "portion" of systems controlling radioiodine releases from Harris (including by trapping, removing, or diverting and holding them) to be replaced? This includes, but is not limited to, components and components of "portions" of such systems which you have identified in response to interrogatories above, and includes but is not limited to components of the liquid radwaste treatment system, air-handling system upstream of the ventilation exhaust treatment system or upstream of the gaseous radwaste treatment system, drains and components that contain radioiodines before they are fed into the liquid radwaste treatment system, components of the ventilation exhaust treatment system, components of the gaseous radwaste treatment system. You may answer only for components that are necessary to control radioiodine releases or are used in such control. Identification of documents giving this information will be acceptable if it is too extensive to readily search out. However, if you have this information on a computer, please search out as much of it as practicable and produce that information, e.g. as a computer printout.

ANSWER: (y) Schedules for replacement of components necessary to control radioiodine releases have not yet been developed and will be developed as part of the plant's maintenance management system. These schedules will consider the vendor's recommended replacement schedules. See Applicants' Responses to 29-9(g) and 29-10(a) above.

29-27(z) For each component inquired about in (y) above or identified in your response to (y) above, please give the schedule, if any (if none, so state, please), for servicing of that component, stating all actions to be taken all checks to

be made, and the conditions (if known) under which replacement would be required, for servicing that component.

(Note: This interrogatory expands on and specifies in more detail things I was asking about in interrogatory 29-7. Please feel free to contact me for clarification or other information re any of it.)

ANSWER: (z) Schedules for servicing the components inquired about in (y) above will be included in the planned development of the maintenance management system. Specific servicing actions, checks and replacement criteria will be developed as part of the maintenance management system.

29-28(a) Are the floor drains of the Harris containment made of PVC? (b) If answer to (a) is other than affirmative, what are they made of? (c) What is the piping from the Harris containment sump to liquid radwaste processing made of? (d) Have Applicants made any study of embrittlement, cracking or deterioration of the material of (i) the Harris containment floor drains (ii) the piping from the Harris containment sump to liquid waste processing? (e) Please give the results of, and identify all documents containing, any study inquired about in (d) above. (f) Do Applicants believe that PVC pipe in the Harris containment floor drains will be exposed to radioactivity? (g) Do Applicants believe that PVC in the Harris floor drains may crack or leak due to deterioration induced by exposure to radioactivity, e.g. gamma radiation, beta rays, alpha radiation? (h) Could radioactive material enter the Harris base mat if the PVC in the drains deteriorated and they leaked? (j) Could radioactive material (including radioiodines) leak from the piping of the Harris containment drains under any other circumstances? (k) If material of Harris floor drains is not PVC, please answer (f), (g) and (h) above for the actual drain material (instead of for PVC as they are written above). (m)(sic)Please state in full the basis for your answers to (f) through (k) above, stating the basis for each answer separately where the answer is not the same.

ANSWER: (a) - (m) Floor drains of the SHNPP containment are made of the same material as the process line it serves (i.e. stainless, carbon and other alloy steels). Floor drainage

piping that may contain potential or actual radioactive material follows the guidelines of Regulatory Guide 1.26. All drain connections are butt welded, thus eliminating the need for gaskets and seals. Stainless steel piping is used from the containment sump to the liquid radwaste processing system. Material specifications are in accordance with NRC Regulatory Guide 1.143 and/or the Applicants' specifications. See Applicants' Response to 29-16(c) above.

29-29(a) Do Applicants know the chemical composition of (i) Cohrlastic R-10480 Gr. Medium Silicone Rubber (ii) the "self-extinguishing rubber-based" material sealing most HEPA filters (iii) the "Fire Retardant Foam", referred to in your response to 29-1(s)? (see your response at 35).

ANSWER: (a) No.

29-29(b) For each part of (a) above for which your answer is affirmative please state (i) what polymer(s) if any are in the material, and what percent (by weight, or by volume, please specify, if known) of the material is composed of each polymer (ii) the non-polymer components of the material (iii) the chemical composition of each component of the material, or the chemical composition of the material, as applicable.

ANSWER: (b) Not applicable.

29-29(c) Are Applicants aware of any information concerning the (i) change in volume (e.g. swelling) (ii) embrittlement (iii) loss of tensile strength (iv) loss of elasticity of (aa)neoprene (bb)closed cell urethane (cc)Cohrlastic R-10480 silicone rubber (dd)the "self extinguishing rubber-based" material used in HEPA filter seals (most of them) (ee)the "Fire Retardant Foam" (ff)any other polymeric material, including PVC (gg)any other material, including steels or asbestos, which (any of which) is used in the seals or materials or gasketing of the SHNPP radwaste system which controls radioiodine emissions (or limits them or prevents them), due to any of the following: (gg)fire (hh)heat (jj)ionizing radiation of any type (kk)gamma radiation c(ll)exposure to lower-than-normal

concentrations of oxygen (mm)exposure to a combination of heat and ionizing radiation (nn)exposure to fire and ionizing radiation (oo)exposure to lower-than-normal (below 21%) concentrations of oxygen in conjunction with either (ooo) ionizing radiation (oooo) heat (ooooo) fire (oooooo) combustion products from fires; (pp)combustion products from fires? (sic) Are you aware of (qq)the document NUREG/CR 2157 (SAND 80-1796) (rr)studies of (rr-a) tensile strength (rr-b)elongation (rr-c)swelling (rr-d) degradation of polymeric material, (rr-e)in NUREG/CR-2157 (rr-f)in any other document (please identify each other document which contains any such studies, stating what it (sic) studies each contains and which matter(s) asked about in rr-a thru rr-d above each includes); (ss)whether fire-retardant cross-linked polyolefin material is used in any seals, gaskets or other parts of the Harris radwaste systems exposed to or containing or processing radioiodines?

Note: Item (v) above reads "elongation".

ANSWER: (c) The Applicants are aware of the developments in the area of equipment qualification regarding the phenomena described, and this awareness is reflected in the design specifications discussed in Applicants' Response to 29-16. Correlating these phenomena to environmental and service conditions anticipated during normal operation for seals or material or gasketing of SHNPP radwaste system components or any other components relied upon to process radioactive effluent is the responsibility of the vendor, as required by the specifications. The Applicants maintain that NUREG CR-2157 is inappropriate for consideration of these phenomena with regard to SHNPP equipment related to Appendix I compliance. This document does not pertain to the specific components in question but rather to commercial cable materials, including ethylene propylene rubber and crosslinked polyolefin insulations and chloreprene and chlorosulfonated polyethylene jackets.

29-30(a) Please state whether Applicants believe that (i) reduced tensile strength (ii) elongation (iii) embrittlement (iv) reduced elasticity (v) oxidation (vi) cracking, of polymeric or polymer-containing materials used in (aa)seals (bb)gaskets (cc)other parts of systems at Harris containing radioiodines (e.g. gas-processing or filtering, liquid radwaste processing systems) could lead to leaks from those systems or parts of them?

ANSWER: (a) The failure of any component including polymeric or polymer-containing material cannot be precluded however the likelihood of such failure can be minimized. In order to reduce the probability of component failure, components are designed for specific service and environmental conditions. In-plant surveillance, testing, inspection and maintenance programs, when coupled with the vendor-recommended replacement schedules, provide assurance that degraded components are repaired and/or replaced prior to loss of function.

29-30(b) For every subpart of (a) above for which your answer is other than affirmative, please state in detail the basis for your belief and identify all documents and facts upon which you rely in making your answer.

ANSWER: (b) Not applicable.

29-30(c) Please identify all information of which you are aware, which is responsive to each subpart of 29-29(c) above, stating for each the subpart(s) to which it is responsive and what information it contains and where in the document that information is.

Note: 29-29 and 29-30 ask more about matters inquired into in interrogatory 29-8 previously. Applicants' counsel asked for more specific questions on this.

ANSWER: (c) See Applicants' Response to 29-29(c).

29-31 If not already given, please state what information asked about in interrogatory 29-6(a) is given in each document you identify in response to 29-6(b) (see your response at 58). Please either supplement your answer to 29-6(b) or provide the info here.

ANSWER: Portions of the information requested are contained in Applicants' Technical Specifications, contained in FSAR section 16.2. Additional information is contained in FSAR sections 9.4, 11.2, 11.3, and Chapter 12. Applicants' maintenance procedures have not yet been developed. See Applicants' Response to 29-27(z). Applicants' purchase order specifications are discussed in Applicants' Response to 29-16(c). Vendor manuals for in-plant filters and monitors are not yet available, and will be supplied with the equipment when it is shipped to Applicants. Some of the information requested in Interrogatory 29-6(a) is contained in the vendor manuals accompanying Applicants' environmental samplers, the Analytical Process Instruments, Inc. Model NRC-2000 Nuclear Air Sampler and the Hydragard Automatic Liquid Sampler.

RESPONSES TO INTERROGATORIES ON CONTENTION 37B

37B-5(a) Why haven't Applicants made any estimate of increased incidence of any disease due to the operation of the Harris plant (and resulting radiation/radioactive material releases to the environment)?

ANSWER: (a) See Applicants' Response to Interrogatory 37B-3(f) in Applicants' Responses filed June 17, 1983 to

Eddleman's Interrogatories (hereinafter, "Applicants' Responses to Interrogatories").

37B-5(b) Why do Applicants believe that I can research the information you possess which would be responsive to interrogatory 37B-1(c) (all parts) and 37B-1(d)?

OBJECTION: (b) See pages 11-12 of The Applicants' Answer filed July 26, 1983 to Eddleman's Motion to Compel Discovery (hereinafter, "Applicants' Answer to Motion to Compel").

37B-5(c) Have Applicants provided any documents to Wells Eddleman so far that are responsive to interrogatory 37B-1(c)(hh) or 37B-1(d)?

37B-5(d) Please list each such document and state when made available, for documents inquired about in (c) above.

OBJECTION: (c) - (d) See Applicants' Objection to Interrogatory 37B-1(c) - (d) at 68 of Applicants' Responses to Interrogatories. See also, pages 11 - 12 of Applicants' Answer to Motion to Compel.

37B-5(e) What other way (besides examining documents in Applicants' possession) would intervenor Eddleman have to research the content of documents in the possession of Applicants, (see your response at page 68)? Please specify each such other way, and indicate if this way is presently available to Eddleman to your knowledge, and whether Applicants would oppose or do oppose the use of that way by Eddleman.

PARTIAL ANSWER/OBJECTION: (e) See Partial Answer/Objection to Interrogatory 37B-5(b).

37B-5(f) Exactly what information inquired about in Interrogatory 37B-2(a) (see your response at 68-69) is protected under the provisions of 10 C.F.R. 2.740(b)(2) in your view? Which provision(s) protect this information? Why?

37B-5(g) Do you contend that anything asked about in interrogatory 37-B-2(a) is work product (i) of attorneys (ii) of your experts or consultants (iii) of anyone else?

FIRST 37B-5(h) Which things asked about in interrogatory (a) are the work product of (i) anyone working for Applicants on this case (ii) attorneys (iii) experts (iv) other persons?

ANSWER: (f) - (h) See Applicants' Answer to Motion to Compel Discovery pages 12 - 15.

SECOND 37B-5(h) Have Applicants made any analysis or study of the work of (i) John Gofman (ii) K.Z. Morgan (iii) Dr. Rosalie Bertel (iv) I.D.J. Bross et al., concerning the health effects of ionizing radiation (aa)as mentioned in contention 37-B (bb)as described in documents identified by Wells Eddleman in response to Applicants' previous or continuing interrogatories?

PARTIAL ANSWER/OBJECTION: (h) With respect to interrogatory (h)(aa), no specific works of the referenced authors are mentioned in Contention 37B, so no answer can be given. With respect to interrogatory (h)(bb), see Applicants' Response to Interrogatory 37B-5(f - h) above. To the extent Intervenor hereafter identifies documents falling under (h)(aa), Applicant will undertake to add them to the list in Appendix 1 to Applicants' Answer to Motion to Compel and to review those documents in the manner described at 12 - 13 of said Answer.

37B-5(j) If response to any part of (h) above is affirmative, do you contend any of the analysis you have made is privileged?

37B-5(k) Do you contend that the fact of whether you have made any analysis of the work inquired about in (h) above is privileged or protected information?

37B-5(l) For any affirmative answer to (k) or (j) above, please state what information or study or analysis you contend is privileged, what you contend is protected, and state fully the reasons why you believe each such item of information is (i) privileged (ii) protected, or both.

37B-5(m) Do you contend, irrespective of your response to (h) above, that your analysis of information provided by Wells Eddleman in response to your interrogatories on 37-B, insofar as it regards factual matters and/or expert opinions concerning radiation health effects (not legal opinions or legal strategy), is privileged or protected?

37B-5(n) If answer to (m) is affirmative, please state in full the basis for your answer, stating what information you believe is (i) protected (ii) privileged.

ANSWER: (j) - (n) See Applicants' Answer to Motion to Compel Discovery at 12 - 15.

37B-5(o) Are Applicants willing to (i) identify documents containing analysis inquired about in (aa) (m) above; (bb) (h) above; (cc) 37B-1(c) of the last set of of interrogatories on this contention (dd) 37B-1(d) ibid, available to Wells Eddleman for inspection and copying?

ANSWER: (o) No.

37B-5(p) If answer to (o) is affirmative, please list the documents you will make available.

ANSWER: (p) Not applicable.

37B-5(r) If answer to (o) above is other than affirmative for any document, please state all basis not already given in response to the above interrogatories, for your answer.

ANSWER: (r) Bases were previously stated.

37B-6(a) (This references your responses to 37B-3 and its parts, your response at 69-73) Do Applicants believe that the only kinds of diseases "caused or enhanced" by radiation are stochastic effects (i.e. cancer and increased incidence of hereditary damage) and non-stochastic (e.g. cataracts)?

ANSWER: (a) Yes. By ICRP definition all radiation induced and radiation associated diseases fall within the categories of either stochastic or non-stochastic effects.

37B-6(b) If your answer to (a) above is other than affirmative, please explain its basis in detail and cite all references and opinions upon which you rely for your answer. Please also explain how your answer is consistent with your previous response at page 71.

ANSWER: (b) Not applicable.

37B-6(c) Please state in full the basis of your belief that no non-stochastic radiation health effects will occur to (i) employees (ii) "neighbors" of the Harris plant. Please identify all documents and opinions upon which you rely in making that statement (see your response at 71).

ANSWER: (c) Non-stochastic effects are considered to include those types of damage that result from collective injury of substantial numbers of cells in affected tissues. Decades of experience in the follow-up of patients who have undergone radiotherapy provide a wealth of scientific and medical information about the tolerance of normal tissues to intensive

X-radiation and gamma radiation received in fractionated exposure over extended periods of time. The threshold doses of conventionally fractionated X-radiation for such effects vary among tissues and effects. For adults the dose varies from a low of 200-300 rem for impairment of the fertility of the ovary, for example, to more than 5000 rem for ulceration of the urinary bladder (UNSCEAR, 1982; ICRP, 1983). (See Attachment A for full citation of documents referenced in the text.) Given the regulatory dose limitations (in maximum levels and under the ALARA requirement) for workers and the general population and given the relative lack of selective tissue radiation in nuclear operations, experienced doses fall well below the referenced estimated threshold levels determined from human medical or scientific experience. Science recognizes an increased susceptability to radiation exposure in the fetus, and to a degree in children as well. This susceptability is taken into account in the establishment of the regulatory dose limits; and again, experienced doses fall well below the estimated threshold levels. (ICRP, 1977.)

37B-6(d) What other non-stochastic radiation-induced health effects are Applicants aware of besides cataracts? Please provide a list or identify documents in which such are listed or discussed.

OBJECTION: (d) See Partial Objection to Interrogatory 37B-3(a) - (e) in Applicants' Responses to Interrogatories. See also Applicants' Answer to Motion to Compel at 15 - 16.

37B-6(e) Is it true, in light of your answer ("partial answer/objection") to 37B-3(e) that a list describing all diseases that Applicants believe can be caused by radiation from Harris would read: All cancers, and all diseases caused by genetic damage?

ANSWER: (e) No. For instance, all experts agree that chronic lymphocytic leukemia is not caused by radiation. (NAS BEIR, 1980, UNSCEAR 1977).

37B-6(f) If answer to (e) is other than affirmative, please state what kinds of diseases (or what diseases) should be included in a list or description of all diseases Applicants believe can be caused by exposure to radiation such as will be released by the Harris plant.

PARTIAL ANSWER/OBJECTION: (f) See Partial Answer/Objection to Interrogatory 37B-3(a) - (e) in Applicants' Responses to Interrogatories.

37B-6(g) Please state in detail, with reference to all documents and expert opinions on which you rely, the basis for your answer to (e) above and to (f) above. If not already stated, please state in detail (including reference to all documents and expert opinions on which you rely, and the specific parts of each such document on which you rely) the basis of Applicants' belief that diseases other than cancer and genetic diseases cannot be caused by radiation from Harris.

ANSWER: (g) See responses to Interrogatories 37B-6(e) - (f). Further, an applicant for an operating license is required to show that the operation of the proposed plant will conform to the radiation limits set forth in the regulations of the Nuclear Regulatory Commission (10 C.F.R. 20 and 10 C.F.R. 50, Appendix I). In these circumstances, radiation exposure for

operation of Shearon Harris is too low to cause an increased risk of any other diseases. (NAS BEIR, 1980; NCRP No. 64, 1980; ICRP, 1977; UNSCEAR, 1977).

37B-6(h) Do Applicants believe that any disease can be enhanced by exposure to radiation, such as that the Harris plant will emit (including internal exposure to radioactive materials emitted from Harris)?

37B-6(j) If answer to (h) above is affirmative, please state what diseases can be so enhanced. A list or a description of the types of diseases will suffice.

37B-6(k) Please state in full, with reference to all documents and expert opinions on which you rely, the basis of your belief that (i) your answer to (j) above is correct (ii) your answer to (h) above is correct (iii) no other diseases than those you list in response to (j) above are enhanced by radiation exposure such as Harris will give to employees and the general public.

ANSWER: (h) - (k) See Responses to Interrogatory 37B-6 (e) - (g).

37B-6(l) If not already stated in response to the above, are there any diseases Applicants believe cannot be (i) caused (ii) enhanced by radiation exposure at the levels employees and persons living near Harris will receive from the Harris plant's operation?

37B-6(m) If your answer to either part of (l) above is affirmative or would be affirmative if answered, please state what diseases are not (i) caused (ii) enhanced by such exposure ("All diseases other than . . ." is an acceptable answer if that is your belief, as is "All diseases" if you believe that).

37B-6(n) Please state in detail, to the extent not given in response to interrogatories above, the basis for your belief expressed in response to (n) (i) above and (n) (ii) above, citing all authorities and documents you rely on for each such belief.

OBJECTION: (l) - (n) See Applicants' Objection to Interrogatory 37B-3(h) in Applicants' Response to Interrogatories.

37B-6(o) Do Applicants believe there are other diseases, besides those they agree can be caused or enhanced by radiation exposure, which have been linked by the medical and scientific community (or any person practicing science or medicine, or trained therein) to radiation? (ref. your response at page 70).

37B-6(p) If response to (o) is affirmative, what such diseases are you aware of, and who has linked them to (i) radiation exposure (ii) low-level radiation?

37B-6(q) If your response to (o) is other than affirmative, please state the basis for your belief in detail, including any authorities, experts or documents upon which you rely.

OBJECTION: (c) - (q) See Partial Objection to Interrogatory 37B(a) - (e) in Applicants' Responses to Interrogatories at 70.

37B-6(r) Is it true that the answer to each part of interrogatory 37B-3(g) is "We know of none"?

ANSWER: (r) No. No answer was provided to Interrogatory 37B-3(g). See objection thereto in Applicants' Responses to Interrogatories.

37B-6(s) Please supplement your answer to 37B-3(h) if you can define the diseases which Applicants believe cannot be caused by radiation. Your objection (p.73) only goes to listing.

OBJECTION: (s) No answer was provided to Interrogatory 37B-3(h). Furthermore, Applicants' objected to that

interrogatory on the ground of lack of relevancy, as well as on the basis of producing a list.

37B-6(t) To the extent not stated above (in response to this and past interrogatories, including the above), please describe or state what diseases Applicants believe are outside the scope of Eddleman contention 37B.

OBJECTION: (t) See Applicants' Objection to Interrogatory 37B-3(h) in Applicants' Responses to Interrogatories.

37B-6(u) Is it true that your answer to 37B-3(j) (response at 73) means that Applicants believe that only cancers and genetically caused diseases can be caused by low-level radiation?

37B-6(v) If answer to (u) above is affirmative, please state in detail why you believe this, unless you have already answered this question in detail.

ANSWER: (u)-(v) See Answer to Interrogatory 37B-6(e)-(g).

37B-7(a) Are there any forms of mental retardation which Applicants believe are caused by genetic problems?

37B-7(b) Are there any forms of mental retardation which are "hereditary damage" as described in your partial answer re 37B-3 on page 71 of your past response?

37B-7(c) If your answer to (a) or (b) above or both is affirmative, describe please for each affirmative answer which such diseases you believe (i) can be caused by radiation exposure to a parent or ancestor (ii) cannot be so caused.

37B-7(d) Are there any forms of mental retardation that Applicants know of, such that you don't know whether they can be genetically caused or not?

37B-7(e) Can you define or describe any diseases inquired about in (d) above? If so, please do so, for as many as you can define or describe.

(f) Please state in detail the basis for your beliefs and answers above.

ANSWER: (a) - (f) Applicants are not aware of any forms of mental retardation genetically induced which have been demonstrated in radioepidemiological studies in the progeny of human populations exposed to ionizing radiation. Applicants are cognizant that some genetic diseases associated with mental retardation do occur. In theory, there could be an increased probability of risk of these diseases from radiation exposure; however, they have never been demonstrated to occur in excess in any radioepidemiological studies. (NAS BEIR, 1980; UNSCEAR 1977, 1982; ICRP, 1977; NCRP No. 64, 1980).

Applicants take this opportunity to clarify and supplement their answer to Interrogatory 37B-4(b) in Applicants' Responses to Interrogatories. The answer to said interrogatory applies in the context of radiation that could be expected from operation of Shearon Harris or other nuclear power plants. Reading the interrogatory more broadly than may have been intended, Applicants would add that mental retardation arising from in utero irradiation to the developing fetus--a health effect with a threshold dose/response--has been linked in Hiroshima and Nagasaki data to elevated exposures in utero. (NAS BEIR 1972 at 80; UNSCEAR 1977 at 682). Such exposures would be considerably higher than permitted under Appendix I.

FIRST 37B-8(a) Why can't you say that operation of the Harris plant will not produce cancer and hereditary damage among persons living within 50 miles of the Harris plant? (reference your response at 74)?

37B-8(b) Is contracting cancer "of significance to health" in Applicants' view?

37B-8(c) Is genetic damage to a person "of significance" to (i) that person (ii) their offspring, in Applicants' view?

FIRST 37B-8(d) Is contracting cancer of "significance to" general well-being in Applicants' view?

FIRST 37B-8(e) You state, p.74, response to 37B-4(a), that individuals who suffer from cancer or hereditary disease can undergo pain and suffering, canincur expenses, and die. Which, if any, of these consequences, do Applicants believe are not of any significance?

ANSWER: (a) - (e) Intervenor apparently misapprehends Applicants' Response to Interrogatory 37B-4(a). The term "of signficance" as used in that response is used in the statistical sense--i.e., health effects, if any, due to radiation from the operation of Shearon Harris will be so negligible as to be undetectable among the people who live within 50 miles of the plant, or among their progeny and descendants for all future generations. Absence of such an observable effect does not eliminate the possibility of a potential stochastic event too limited to be detectable.

FIRST 37B-8(f) Do Applicants know the cost (for any hospitals or areas within 50 miles of the Harris plant) of (i) treatment for any cancer (ii) treatment for any specific cancer (iii) treatment for cancer where the patient recovers (iv) treatment for cancer where the patient dies?

FIRST 37B-8(g) If Applicants' answer to any part of (f) above is affirmative, please state what you know regarding each subpart of (f) above.

OBJECTION: (f) - (g) Hospital costs are irrelevant as being beyond the scope of Contention 37B. Contention 37B addresses solely the relative accuracy of referenced estimates of the numbers of victims from radiation exposure. No contention whatever is made regarding hospitalization costs. In addition the Board already has held that economic costs of and from operations of the plant are outside the scope of this proceeding and barred by 10 C.F.R. 51.53. Applicants further object on the grounds that the question is too vague to permit an answer and that such information can be researched by Mr. Eddleman independently of Applicants.

FIRST 37B-8(h) Does CP&L place any value on a human life (dollar value) in its nuclear operations? If so, what is that value and does it differ according to (i) age (ii) sex (iii) income (iv) job (v) any other factors (please specify). Please give all values you use.

OBJECTION: (h) See Applicants' Objection to Interrogatory FIRST 37B-8(f) - (g), supra and to Interrogatory SECOND 37B-8 (d) - (t).

FIRST 37B-8(j) What part(s) of the two documents cited in your answer to Interrogatory 37B-4(c) do you rely on? Please identify pages, chapter(s) and specific facts therein (if any) on which you rely.

ANSWER: (j) The reference in the BEIR-III Report is to pages

482-85. The reference to the UNSCEAR 1982 Report should be amended to read as follows: Sources and Effects of Ionizing Radiation, 1977 UNSCEAR Report at 681-82.

FIRST 37B-8(k) Do Applicants believe that radiation exposure (i) plays no role in (ii) enhances (iii) can cause heart disease? For each part, please state in full the basis of your belief, including all documents and expert opinions on which you rely.

FIRST 37B-8(l) Do Applicants believe that radiation exposure (i) plays no role in (ii) may enhance (iii) does enhance (iv) can enhance (v) can cause (vi) does cause allergies? Please state for each part the full basis for your answer, including all documents and expert opinions on which you rely.

FIRST 37B-8(m) Do Applicants believe that radiation exposure (i) plays no role in (ii) may enhance (iii) can enchance (iv) does enhance (v) may cause (vi) can cause (vii) does cause heart attacks in humans? Please state, for each part, the full basis of your answer including any documents and any expert opinions you rely on.

ANSWER: (k) - (m) There are no reliable or even suggestive epidemiological studies which demonstrate an excess of heart disease, allergies or heart attacks as causally related to radiation exposure. No evidence of causal relation was found, for instance, in the two most extensive and detailed surveys, namely, surveys of Japanese atomic bomb survivors and the patients exposed to theraputic radiation for treatment of ankylosing spondylitis. (UNSCEAR, 1977; NAS BEIR, 1980; Smith and Doll, 1982; Beebe, 1981; Beebe, et al., 1978). This result is in accord with the conclusions of ICRP (1977) and of the United Nations Scientific Committee on Effects of Atomic

Radiation (see NAS BEIR, 1980 at 505). There are case histories of patients receiving radiotherapy to the heart or lymph nodes with a resulting non-stochastic impact on the heart and lymph nodes. The doses involved, however, were several thousand rads, and not pertinent in this proceeding. (ICRP, 1983; NCRP No. 64 1980). Bross has contended there is a relation between low level radiation and heart disease and allergies (Bross, 1972, 1977, and Bross, et al., 1978); however, his theses have been thoroughly discredited (see Smith et al., 1973; NCRP, 1980; GAO, 1980 and NAS BEIR 1981).

FIRST 37B-8(n) Do Applicants believe there is any relationship between radiation exposure and (i) accidental death (ii) suicide (aa)for low-level radiation such as Harris is expected to emit in "normal operation" (bb)for low-level radiation such as Harris may emit in accidents below Class VIII (cc) for radiation such as Harris may emit during a Class IX accident (dd)for radiation exposures in the "worst case" analysis of the NRC's DEIS (the greatest radiation release considered therein)?

FIRST 37B-8(o) For each subpart (2 x 4 = 8 subparts) of (n) above, please explain in detail the basis for your answer, including all documents and expert opinions on which you rely.

ANSWER: (n) - (o) No. There are no epidemiological studies which demonstrate an excess of accidental deaths or suicides causally related to exposure to radiation from normal nuclear plant operation. Further, this has not been observed in the aftermath of a nuclear power plant accident. In particular, after the TMI accident (the highest classification accident experienced to date in a commercial nuclear power plant), there

was no excess of accidental deaths or suicides in the general population living in the region of TMI or in the worker population at TMI. (UNSCEAR 1977; NAS BEIR 1980; Report of the President's Commission of the Accident at TMI, 1979; Houts, et al., 1980; Fabrikant, 1981; Fabrikant, 1983; Bromet, 1980)

FIRST 37B-8(p) Is there any other basis for your answer to 37B-4(c) than given in your response? If so, please state all such additional basis.

ANSWER: (p) See Answer to Interrogatory 37B-7(a)-(f).

SECOND 37B-8(a) Do Applicants have any information on what dollar value, if any, persons living within 50 miles of the Shearon Harris plant (or any such person) place(s) on their own life?

SECOND 37B-8(b) If answer to (a) is affirmative, please state that value or values and the number of persons to which each such value applies, and how these values (each such value) were determined.

SECOND 37B-8(c) Do Applicants know if there are persons residing within 50 miles of the Harris plant who would refuse to accept any amount of money, no matter how large, as the dollar value of their life? Do Applicants know any persons who do refuse to do so?

OBJECTION: (a) - (c) These interrogatories are irrelevant to Contention 37B, first, because evaluation of a life is beyond the scope of Contention 37B. See Response to Interrogatory FIRST 37B-8(f)-(g), supra. Second, a NEPA evaluation is an attempt to evaluate actual environmental impact, and it specifically does not include evaluation of the perception of risk of people in the neighborhood of a nuclear power plant. See,

Metropolitan Edison Co. v. People Against Nuclear Energy, 103 S. Ct. 1556 (1983). Applicants futher object on the grounds that the interrogatories are too vague to permit an answer and that such information can be researched by Mr. Eddleman independent of Applicants.

SECOND 37B-8(d) Do Applicants have any opinion as to how much electricity generation a person's life is worth?

SECOND 37B-8(e) Do Applicants have any opinion as to how much additional capacity on the CP&L system one person's life is worth?

SECOND 37B-8(f) Please state in full the basis for each opinion you have in regard to the matter of (d) above and of (e) above, giving all documents, computations, opinions and information you rely on for your response.

SECOND 37B-8(g) Do Applicants believe that the entire expected lifetime electrical output of the Harris plant (by their estimates) is worth (i) less than one person's life (ii) one person's life (iii) more than one person's life?

SECOND 37B-8(h) If your response to (g)(iii) above is affirmative, how many lives do you think it is worth?

SECOND 37B-8(j) Do Applicants believe that, for NEPA purposes, the benefits of electricity to be derived from the Harris plant (i) at 70% lifetime capacity factor, per Applicants (ii) at 55% lifetime capacity factor, per NRC Staff, are, on balance, greater than the environmental detriment of (aa)the loss of one human life (bb)the loss of less than one human life (cc)the loss of more than one human life (dd)the loss of one human life per reactor-year of operation (ee)an increase in the incidence of genetic disease of (ee-a)one (ee-b)one per future generation (ee-c)less than one (ee-d)less than one per future generation (ee-3)more than one per future generation (ee-f)more than ten per future generation (ee-g)more than 100 per future generation (ee-h) more than one in fatal genetic diseases (33-i)more than one per generation in fatal genetic diseases (ee-j)more than 10 per generation in fatal genetic diseases

(ee-k)more than 100 per generation in fatal genetic diseases (ee-l)more than 1000 per generation in fatal genetic diseases (ee-m)more than 10,000 per generation in fatal genetic diseases (ee-n) more than 100,000 per generation in fatal genetic diseases (ee-o) more than 1,000,000 per generation in fatal genetic diseases (ee-p) more than 1000 per generation in fatalities from genetic and non-genetic diseases (ee-r)more than 10,000 per generation in deaths from genetic and non-genetic diseases (ee-s)the loss of ten human lives per reactor-year of operation (ee-t)the loss of 30 human lives per reactor year of operation (ee-u)the loss of 100 human lives per reactor year of operation (ee-v)the loss of 1000 human lives per reactor year of operation (ee-w)the loss of 10,000 human lives per reactor-year of operation (ee-x)the loss of 100,000 human lives per reactor year of operation (ee-y)the loss of 1,000,000 human lives per reactor-year of operation (ee-z)the risk (as you many(sic) estimate or quantify it) of a catastrophic nuclear accident at the Harris site?

SECOND 37B-8(k) Is there any upper limit on (i) the number of directly caused somatic deaths (ii) the number of genetically caused deaths (iii) the potential property damage from a nuclear accident (iv) the potential loss of life from somatic effects of a nuclear accident (v) the potential loss of life from genetic effects of a nuclear accident, for Harris, that Applicants believe would be unacceptable under NEPA in comparison to the benefits of electricity and capacity Applicants estimate will be derived from Harris?

SECOND 37B-8(l) Are any of the limits you identify in response to any part of (k) above ones that you believe should cause NRC to deny an operating license to Harris if the effect to which the limit applies (i) equals (ii) exceeds that limit? If so please specify which limits.

SECOND 37B-8(m) What are the limits for each subpart of (k) above, in Applicants' view? Please quantify (sic) or specify them. (e.g. the limit is 1500 deaths per (i)).

SECOND 37B-8(n) Please give the basis for your answer to each part or subpart of (g) through (m) above, identifying all documents and expert opinions you rely on for your answer.

SECOND 37B-8(o) Is there any number of cases of (i) all diseases (ii) any diseases (iii) heart disease (iv) allergies which, if shown to be caused by radiation emitted from the Harris plant (or to be so emitted), would in Applicants' view

(aa)justify not issuing an operating license for Harris on NEPA grounds (bb)justify shutting down the plant if it were operating (cc)justify placing additional limitations on radioactive emissions from Harris?

SECOND 37B-8(p) Please state the number (if any) which is asked for each subpart of (o) above (3 x 4 = 12 parts).

SECOND 37B-8(q) Please state the basis for your answer to each part of (o) and (p) above including all documents and expert opinions on which you rely.

SECOND 37B-8(r) Is there any amount of pain and suffering associated with (i) all health effects, including genetic (ii) all non-genetic health effects (iii) all genetic health effects from Harris which, if it were exceeded, would justify the NRC under NEPA in (aa)not licensing the Harris plant to operate (bb)shutting Harris down (cc)limiting Harris' radioactive emissions more strongly than at present, if that amount were shown to be caused by Harris' radioactive emissions, in Applicants' view?

SECOND 37B-8(s) For each part of (r) above (3 x 3 = 9 parts) please state the number of amount (e.g. 5 people in severe pain for 30 years, or 150 person-years of severe pain, etc.) which is asked about in that part.

SECOND 37B-8(t) Is there any combination of health effects and pain and suffering which, if it were shown to be caused by Harris operation, would justify NRC in denying an operating license to the Harris plant under NEPA, in your view? If so, please state the combination (or the least severe combination you think would so justify the NRC in not licensing Harris under NEPA). If not, please state in full the basis for your answer, including all cases, documents or expert opinions you rely on.

OBJECTION: (d) - (t) Applicants' personal view of the evaluation to be made under NEPA is totally irrelevant. NEPA evaluation is an obligation of the government agency, not of any private party. Nothing in the NRC's NEPA evaluation procedure

requests or requires such views of Applicant, nor is this taken into account in the NRC NEPA analysis. Applicants further object because in substantial part Intervenor has established no foundation for the factual premises of the interrogatories posited, and Applicants are not required to respond to random

hypotheses, generated willy-nilly by Mr. Eddleman, having no practical relation to reality.

Objections submitted by:

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Counsel for Applicants

Dated: August 19, 1983

ATTACHMENT A

References

Bross, I.D.J., and Natarjan, N., "Leukemia from Low-Level Radiation: Identification of Susceptible Children," New England J. of Med. 287:107-110 (1972) (Bross, 1972)

The Effects on Populations of Exposure to Low Levels of Ionizing Radiation. The "BEIR" Committee Report. National Academy of Sciences/National Research Council, Washington, D.C. (1972) (NAS BEIR 1972)

Ionizing Radiation: Sources and Effects, United Nations Scientific Committee on the Effects of Atomic Radiation, 1977. Report to the General Assembly. United Nations, New York (1977) (UNSCEAR 1977 Report)

Smith, P.G., Pike, M.C., and Hamilton, L.D., "Multiple Factors in Leukaemogenesis," Letter to Editor, Brit. Med. J. 2:482-483 (1973) (Smith et al., 1973)

Bross, I.D.J. and Natarjan, N., "Genetic Damage from Diagnostic Radiation," J. Amer. Med. Assoc. 237:2399-2401 (1977) (Bross, 1977)

Recommendations of the International Commission on Radiological Protection. ICRP Publication 26, Annals of the ICRP, Vol. 1, No. 3, 1977, Pergamon Press, New York (ICRP 1977)

The Effects on Populations of Exposure to Low Levels of Ionizing Radiation. The "BEIR III" Report. National Academy of Sciences/National Research Council, Washington, D.C., 1980 (NAS BEIR 1980)

National Council on Radiation Protection and Measurement Report No. 64, Influence of Dose and Its Distribution in Time of Dose-Response Relationships for Low-LET Radiations. NCRP, Washington, D.C., 1980 (NCRP No. 64 1980)

Beebe, G.W., "The Atomic Bomb Survivors and the Problem of Low-Dose Radiation Effects," Am. J. Epidemiol. 114:761 (1981) (Beebe, 1981)

General Accounting Office. Report to the Congress of the United States, Problems in Assessing the Cancer Risks of Low-Level Ionizing Radiation Exposure. GAO Publication January 1981, Washington, D.C. (GAO 1981)

Smith, P.G., and Doll, R., "Mortality Among Patients with Ankylosing Spondylitis after a Single Treatment Course of X-rays," Br. Med. J. 284:449 (1982) (Smith and Doll, 1982)

Beebe, G.W., Kato, H., and Land, C.E., "Studies of the Mortality of A-Bomb Survivors, 6. Mortality and Radiation Dose, 1950-1974," Radiat. Res. 75:138-201 (1978) (Beebe, et al., 1978)

Fabrikant, J.I., "Health Effects of the Nuclear Accident at Three Mile Island," Health Phys. 40:151-161 (1981) (Fabrikant, 1981)

President's Commission on the Accident at Three Mile Island. Staff Reports to the President's Commission on the Accident at Three Mile Island. Reports of the Public Health Service and Safety Task Force, p. 9. U.S. Government Printing Office, Washington, D.C. (1979) (Report of the President's Commission of the Accident at TMI, 1979)

Ionizing Radiation: Sources and Biological Effects, United Nations Scientific Committee on the Effects of Atomic Radiation, Report to the General Assembly, with Annexes, United Nations, New York (1982) (UNSCEAR 1982 Report)

Fabrikant, J.I., "The Effects of the Accident at Three Mile Island on the Mental Health and Behavioral Responses of the General Population and Nuclear Workers," Health Physics, 42 (1983) (Fabrikant, 1983)

Bromet, E., "Preliminary Report on the Mental Health of Three Mile Island Residents," Pittsburgh, Western Psychiatric Institute and Clinic (1980) (Bromet, 1980)

Houts, P.S., Miller, R.W., Tokuhata, G.K., Ham, K.S., "Behavioral Impact of the Three Mile Island Nuclear Incident," Report Submitted to the TMI Advisory Panel on Health Research Studies of the Pennsylvania Department of Health (1980) (Houts et al., 1980)

Report of Task Group on Nonstochastic Effects of Radiation. International Committee on Radiological Protection, ICRP (1983) (ICRP 1983)

Bross, I.D.J., Ball, N., Rvepko, T., Laws, R.E., "Preliminary Report on Radiation and Heart Disease," J. Med. Vol. 9:3-15 (1978) (Bross et al., 1978)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
AND NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power Plant, Units 1 and 2)	)	

AFFIDAVIT OF DAVID MCCARTHY

County of Wake)
) ss.
State of North Carolina)

DAVID McCARTHY, being duly sworn according to law, deposes and says that he is Project Engineer, Harris Plant Engineering Section of Carolina Power & Light Company; that the answers to Interrogatories 29-9(g), 29-10, First 29-11, Second 29-11, 29-13, 29-14, 29-15, 29-16, 29-20, 29-21, 29-22, 29-23(a)-(d), (g)-(k), (n), (w), (z), 29-24, 29-25, 29-27(m), (n)-(s), (u), (v), 29-28, 29-29, and 29-30 contained in "Applicants' Responses to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)" are true and correct to the best of his information, knowledge and belief; and that the sources of his information are officers, employees, agents, and contractors of Carolina Power & Light Company.

David McCarthy

Sworn to and subscribed before me,
this 19th day of August, 1983.

Linda Graves
Notary Public

LINDA GRAVES
NOTARY PUBLIC
WAKE COUNTY, N. C.
My Commission Expires October 2, 1983

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	)	Docket Nos. 50-400 OL 50-401 OL
	)	
	)	
(Shearon Harris Nuclear Power Plant, Units 1 and 2)	)	

AFFIDAVIT OF B. H. WEBSTER

County of Wake)
)
State of North Carolina)

B. H. Webster, being duly sworn, according to law, deposes and says that he is Manager - Radiological & Chemical Support Section of Carolina Power & Light Company; that the answers to Interrogatories 29-9(a)-(h), First 29-11(b), 29-12(a), (c), (d), First 29-19, Second 29-19, 29-27(a)-(h), and (j)-(l) contained in "Applicants' Responses to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al (Fourth Set)" are true and correct to the best of his information, knowledge and belief; and that the sources of his information are officers, employees, agents and contractors of Carolina Power & Light Company.

B. H. Webster

Sworn to and subscribed before me this 18th day of Aug, 1983.

Betty L. Hicks
Notary Public

BETTY L. HICKS NOTARY PUBLIC WAKE COUNTY N.C.

My Commission Expires: September 28, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
AND NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

AFFIDAVIT OF SHERWOOD ZIMMERMAN

County of Wake)
) ss.
State of North Carolina)

SHERWOOD R. ZIMMERMAN, being duly sworn according to law, deposes and says that he is Manager - Licensing & Permits, Harris Plant of Carolina Power & Light Company; that the answers to Interrogatory 29-17 contained in "Applicants' Responses to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)" are true and correct to the best of his information, knowledge and belief; and that the sources of his information are officers, employees, agents and contractors of Carolina Power & Light Company.

Sherwood R. Zimmerman
Sherwood R. Zimmerman

Sworn to and subscribed before me,
this 18th day of August, 1983.

Lisa M. Randall
Notary Public

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
AND NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

AFFIDAVIT OF RICHARD E. MORGAN

County of Wake)
) ss.
State of North Carolina)

RICHARD E. MORGAN, being duly sworn according to law, deposes and says that he is Manager - Plant Operations, Harris Plant of Carolina Power & Light Company; that the answers to Interrogatories 29-23(e) and (f), 29-27(t), (w)-(z), and 29-31 contained in "Applicants' Responses to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)" are true and correct to the best of his information, knowledge and belief; and that the sources of his information are officers, employees, agents and contractors of Carolina Power & Light Company.

Richard E. Morgan

Sworn to and subscribed before me,
this 19th day of August, 1983.

Linda Graves
Notary Public

LINDA GRAVES
NOTARY PUBLIC
WAKE COUNTY, N. C.
My Commission Expires October 2, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	
	)	
NORTH CAROLINA EASTERN MUNICIPAL POWER AGENCY	)	Docket Nos. 50-400 OL 50-401 OL
	)	
(Shearon Harris Nuclear Power Plant, Units 1 & 2)	)	

AFFIDAVIT OF JACOB I. FABRIKANT

County of Alameda	)	
	)	ss
State of California	)	

Jacob I. Fabrikant, being duly sworn according to law, deposes and says that he is a consultant to Carolina Power & Light Company in the area of radiological health and medicine, and that the answers to Interrogatories 37B-6 (a-c), (e-k), (u-v); 37B-7; First 37B-8 (a-e), (j-p), contained in "Applicant's Response to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B (Fourth Set)" are true and correct to the best of his information, knowledge and belief.

Jacob I. Fabrikant, M.D., Ph.D.

Sworn to and subscribed to
before me this 18th day of
August 1983.

Notary Public

OFFICIAL SEAL
THOMAS N THOMAS
NOTARY PUBLIC - CALIFORNIA
ALAMEDA COUNTY
My comm. expires NOV 4, 1983

My commission expires _____

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
AND NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Response to Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)", "Applicants' Response to Wells Eddleman's Request for Production of Documents on Contentions 29 and 37B to Applicants Carolina Power & Light Company, et al. (Fourth Set)", and "Certification of Counsel" were served this 19th day of August, 1983 by deposit in the U.S. mail, first class, postage prepaid, to the parties on the attached Service List.

Jeffrey J.A. Gibbs

Dated: August 19, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
and NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

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August 19, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 & 2)	)	

CERTIFICATION OF COUNSEL

I hereby certify that I have made the following efforts to resolve Applicants' objections to certain of Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 and 37B (Fourth Set), dated July 20, 1983.

I spoke with Mr. Eddleman by telephone on August 19, 1983. Given the volume of the discovery material at issue and the press on Mr. Eddleman to complete his responses to Applicants' discovery requests on these same contentions, it was agreed to postpone negotiation discussions on Applicants' objections until Mr. Eddleman has received and reviewed the responses (answers as well as objections) provided.

Thomas A. Baxter

Thomas A. Baxter, P.C.