UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD
Glenn O. Bright
Dr. James H. Carpenter
James L. Kelley, Chairman

In the Matter of CAROLINA POWER AND LIGHT CO. et al. (Shearon Harris Nuclear Power Plant, Units 1 and 2)	Dockets 50-400 OL 50-401 OL

Wells Eddleman's General Interrogatories and Interrogatories on Contentions 29 + 37B
to Applicants Carolina Power & Light et al.
(FOURTH Set)

Under 10 CFR 2.740, 2.741 and the Board's 9-22-82 Memorandum and Order, Wells Eddleman requests Applicants to answer separately and fully in writing, under oath or affirmation, each of the following interrogatories, and to produce a permit inspection and copying of the original or best copy of all documents identified in response to interrogatories as set forth below.

These interrogatories are intended to be continuing in nature, and I request each answer to be promptly supplemented or amended as appropriate under 10 CFR 2.740(e), should CP&L, NCEMPA, any other Applicant, or any contractor or consultant to any, some or all of those, or any employee of any or some or all of them, or any individual acting on behalf of any or some of all of them, obtain or create any new or differing information responsive to these general interrogatories. (where "Them" refers to the preceding listing(s)) The request for production of documents is also continuing and requests Applicants to produce promptly if not immediately any additional documents the Applicants and others acting on their behalf or employed by them, as listed in the previous

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sentence, obtain which are responsive to the request(s) for production of documents below.

Where identification of a document is requested, please briefly describe the document (e.g. book, notebook, letter, memo, report, notes, transcript, minutes, test data, log, etc.) and provide the following information as applicable: document name, title, number, author(s), date of writing or of publication or both, addressee, date approved, by whom approved, and the name and address of the persons having normal custody of the document, and name and address of any person other than the preceding having actual possession of the document. When identifying documents in response to these interrogatories and requests, please state the portion or portions of the document (e.g. sections, chapters, pages, lines) upon which Applicants rely or which Applicants swear or affirm is/are responsive to the applicable interrogatory or request.

DEFINITIONS herein:

"Harris", "Harris Plant", "SHNPP", or "plant" where not specified otherwise, all mean the Shearon Harris Nuclear Power Plant.

"Applicants" means all of the persons, employees, consultants, contractors and corporations as listed in the first sentence of the second paragraph on page 1 of this document, above.

"FSAR" means the Harris Final Safety Analysis Report.

"ER" means the Harris Environmental Report.

"Document(s)" means all writings and records of every type, including electronic and computer records, in the possession, control or custody of Applicants or any individual(s) acting on Applicants' behalf, including, but not limited to: reports, books, memoranda, correspondence, notes, minutes, pamphlets, leaflets, magazines, articles, surveys, maps, bulletins, photographs, speeches, transcripts,

voice recordings, computer printouts, information stored in computers or computer peripheral devices such as disks, drums, etc., voice recordings, microfilm, microfiche and all other writings or recordings of any kind(s); and copies of any of the preceding even though the original(s) are not in the possession of Applicants or in their custody or control. Document(s) shall be deemed to be within the control of Applicants or any individual(s) acting on their behalf if they have ownership, possession, or custody of the document(s) or a copy thereof, or have the right to secure the document(s) or a copy thereof, from any person or public or private entity having physical possession thereof.

Each definition given above applies within all other definitions above.

GENERAL INTERROGATORIES

G1 (a) Which contentions of Wells Eddleman do Applicants agree are now admitted in this proceeding, NRC Dockets 50-400/401 O.L.?

(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:

(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.

(d) Please identify all facts concerning which each such person identified in response to G1(c)(1) above has first-hand knowledge.

(e) Please identify all facts and/or documents upon which each person identified in response to G1(c)(2) above relied in providing information to respond to the interrogatory, including the parts of such documents relied upon.

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

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

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

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

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

(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.

(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.

(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.

G3(a) Please identify any other source(s) of information which Applicants have used to respond to any interrogatory identified under G1 above, stating for each such source the interrogatory to which it relates, and what information it provides, and identifying where in such source that information is to be found.

(b) Please identify any other source(s) of information not previously identified upon which any witness identified under G2 above, or other witness, has used in preparing testimony, or exhibits or expects to use in testimony or exhibits, identifying for each such source the witness who is expected to use it, and the part or part(s) of such source (if applicable) which are expected to be used, and, if not previously stated, the fact(s) or subject matter (or both) to which such source relates.

G4(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.

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

G5 (a) for each contention Applicants state or admit is an admitted Eddleman contention under G1(a) above, or an admitted joint intervenor contention, please state whether Applicants have available to them experts, and information, on the subject matter of the contention.

(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.

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, sections or pages, if any, upon of the document, which Applicants rely

(vi) the specific information each part, section or page identified in response to (v) above contains.

(vii) identify all documents used in preparing the document, to the extent known (and also to the extent not identified in the document itself)

(viii) state whether Applicants 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 ~~with-~~ 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.

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 G1(a), or (ii) is the subject of interrogatories in this set; please state for which contention or contentions each exhibit will be or is expected to be offered.

(b) Please identify all documents which Applicants plan, expect or intend to use in cross-examination of any other parties' witnesses or joint intervenor witness in this proceeding, with respect to (i) Eddleman contentions identified under G-7(a)(i) (or G1-(a)) above, or any other Eddleman contention which is the subject of interrogatories in this set; (ii) each Joint contention now admitted in this proceeding; (iii) per our agreement of 4-8-83, each contention of each other party to this proceeding which is currently admitted. Please identify for each such document the witnesses, or witness, and all contentions with respect to whom (or which) that document is planned, expected, or intended to be offered or used.

(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.

G8 (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) 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 the 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.)

G-10(a) Where the above general interrogatories, or any of them, and/or specific interrogatories below, call for identification of documents, (i) and no documents are identified, is that the same as Applicants stating that there are no documents responsive to this general interrogatory, in each case where no documents are identified? (ii) and documents are identified, is that the same as Applicants stating that the identified

documents are the only ones presently known which are responsive to the interrogatories? (iii) If your answer to G-10(a)(ii) is other than affirmative, please state all reasons for your answer. (iv) If your answer to G-10(a)(i) above is other than affirmative, please state all reasons for your answer.

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

(vi) If your response to (ii) above is other than affirmative, please identify each document which contains a fact not previously 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.

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.

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? (ii) if not exactly every seven days, does your statement mean that each such sampler is changed at least once in each calendar week? (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. (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? (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; (bb) what happens if a sampler is not changed on schedule, including when it will be changed, and when its sample will be analyzed (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.

(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.

(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)

(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 of Applicants for Harris?

(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 equip_ment each such criterion applies.

(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.

(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.

(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.

(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 (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 (iii) for all affirmative responses to (ii) above, please identify who made the determination, and when if known. (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 test, 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.

(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.

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. (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.

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. (b) please state exactly how the "radiological monitoring 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.

(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)?

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? (b) Please describe the known differences between the two systems with respect to radioiodine release points, control of radioiodine levels in effluents, and sampling, monitoring and testing for radioiodines. (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? (d) Do Applicants agree that their FSAR says VC Summer and Harris are very similar plants and compares them at some length? (e) for any answer other than affirmative to (c) or (d) above, please state in detail all basis for each such answer.

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 inappropriate (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? (b) Do Applicants believe that sampling of animal thyroids is inappropriate for environmental radioiodine monitoring? (c) Do Applicants believe any NRC rule or policy forbids sampling of animal thyroids around nuclear plants as part of environmental monitoring? (d) please state in detail all basis for your answer to (i): (b) above, and (ii): (c) 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.

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.)

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? (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 requested data 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.

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)? (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. (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). (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. (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.

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. (b) what does the statement quoted above mean? (c) what did you use the RDU airport data for, when you compared it with Harris plant site data? (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?

(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. (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). (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.

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.

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)/? (b) If so, please identify each such study and all documents containing it. (c) Have Applicants xxx 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. (d) Is tobacco analyzed for radioiodine content in the Harris environmental monitoring program? If not, why not? (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.

29-19(a) In your response at 46-47 (re 29-3(g)), 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.

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. (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. (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? (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.

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

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? (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. (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. (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. (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).

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. (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."? (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"? (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. (e) How often is the I-131 content of primary coolant to be sampled at Harris? Please give any applicable schedule(s). (f) Is every sample of primary coolant to be tested for I-131? If not, which ones will be? (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)? (h) If answer to (g) is affirmative, identify each such isotope and the applicable limit. (j) In your answer to 29-4(n) (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? (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? Please identify each such procedure and all documents containing it. (l) Is a procedure of comparing known fuel defects to primary coolant fission product inventory used at the H.B. Robinson nuclear plant? (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. (n) Is there any limit at all for Harris on the fuel cladding defect fraction? (o) Is there any limit for Brunswick on the fuel cladding defect fraction? (p) If response to (o) is affirmative, was such limit imposed by NRC Staff (i) in early 1979 (ii) at any other time? (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? (r) How do the methods for inspection of fuel for defects at (i) Robinson (ii) Harris differ from the methods used at Brunswick? (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. (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?

29-23 continued
(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.
(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.
(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?
(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, ~~xxx~~ before loading fuel there.
(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.
(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.

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). (b) Have Applicants verified compliance with any such 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, ? (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.

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

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. (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 information which cannot lead to admissible evidence re Eddleman 29? (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.

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? (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. (c) What is the minimum operable configuration of the gaseous radwaste treatment system at Harris under which normal operation of the plant is allowed? (d) Is there any technical specification for Harris with respect to ability to trap or absorb radioiodines before they are released to the environment? (e) If answer to (d) is affirmative, please list each such technical specification and identify all documents containing each. (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 animals (iv) radioiodine present in the thyroids of humans around the plant (v) radioiodine, excluding medical exposures, in thyroids of humans around the plant? (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. (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? (j) What is the minimum operable configuration of the liquid radwaste treatment system at Harris under which normal operation is allowed? (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 CFR 50 App I, (ii) Section II.C thereof (iii) Section II.D thereof (iv) 10 CFR 50.36a (v) 10 CFR 50.36(a) (vi) General Design Criterion 60 of 10 CFR 50 Appendix A. (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 allprocedures you use to do so, and all documents containing each such procedure.

29-27 continued for Harris
(m) Has NRC staff approved compliance with all of the sections of 10 CFR 50 and its appendices cited by you in response to Interrogatory 29-7(a) (and reproduced or set forth in part (k) above)? (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. (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? (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)? (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
(r) Are any other parts of (i) the gaseous radwaste treatment system (ii) the liquid radwaste treatment system (iii) the ventilation exhaust 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 (vi)? (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.
(t) On what schedule is the (i) 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 documents containing this information.
(u) are any of the parts identified in response to (r) above necessary to remove radioiodines at Harris? (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).
(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?
(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.

29-27 continued
(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 research 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.
(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.)

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) 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.

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)

29-29 continued
(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.
(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 (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? **Are you aware** of (qq) the document NUREG/CR 2157 (SAND80-1796) (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 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".
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? (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.
(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.

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.

Interrogatories on Eddleman 37-B

37-B-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)? (b) Why do Applicants believe that I can research the information you possess which would be responsive to interrogatory 37-B-1(c)(all parts) and 37-B-1(d)? (c) Have Applicants provided any documents to Wells Eddleman so far that are responsive to interrogatory 37-B-1(c, hh) or 37-B-1(d)? (d) Please list each such document and state when made available, for documents inquired about in (c) above. (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. (f) Exactly what information inquired about in Interrogatory 37-B-2(a) (see your response at 68-69) is protected under the provisions of 10 CFR 2.740(b)(2) in your view? Which provision(s) protect this information? Why? (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? (h) Which things asked about in interrogatory 37-B-2(a) are the work product of (i) anyone working for Applicants on this case (ii) attorneys (iii) experts (iv) other persons? (h) Have Applicants made any analysis or study of the work of (i) John Gofman (ii) K.Z. Morgan (iii) Dr. Rosalie Bertell (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? (j) If response to any part of (h) above is affirmative, do you contend any of the analysis you have made is privileged? (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? (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. (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? (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. (o) Are Applicants willing to (i) identify documents containing analysis inquired about in (aa) (m) above; (bb) (h) above;(cc) 37-B-1(c) of the last set of interrogatories on this contention (dd) 37-B-1(d) ibid , available to Wells Eddleman for inspection and copying? (p) If answer to (o) is affirmative, please list the documents you will make available. (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 anwer.

37-B-6(a) (This references your responses to 37-B-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)? (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. (c) Please state in full the basis of your belief that now 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). (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. (e) Is it true, in light of your answer ("partial answer/objection") to 37-B-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? (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. (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. (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)? (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.(k) Please state in full, with reference to all documents and expert opinions on which your 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. (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? (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). (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.

37-B-6 continued
(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). (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? (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. (r) Is it true that the answer to each part of interrogatory 37-B-3(g) is "We know of none"? (s) Please supplement your answer to 37-B-3(h) if you can define the diseases which Applicants believe cannot be caused by radiation. Your objection (p.73) only goes to listing. (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 37-B . (u) Is it true that your answer to 37-B-3(j) (response at 73) means that Applicants believe that only cancers and genetically caused diseases can be caused by low-level radiation? (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.

37-B-7(a) Are there any forms of mental retardation which Applicants believe are caused by genetic problems? (b) Are there any forms of mental retardation which are "hereditary damage" as described in your partial answer re 37-B-3 on page 71 of your past response? (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. (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? (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.
37-B-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)? (b) Is contracting cancer "of significance to health" in Applicants' view? (c)Is genetic damage to a person "of significance" to (i) that person (ii) their offspring, in Applicants' view? (d) Is contracting cancer of "significance to" general well-being in Applicants' view? (e) You state, p.74, response to 37-B-4(a), that individuals who suffer from cancer or hereditary disease can undergo pain and suffering, can incur expenses, and can die. Which, if any, of these consequences, do Applicants believe are not of any significance?
(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? (g) If Applicants' answer to any part of (f) above is affirmative, please state what you know regarding each subpart of (f) above. (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.

37-B-7 continued
(j) what part(s) of the two documents cited in your answer to Interrogatory 37-B-4(c) do you rely on? Please identify pages, chapter(s) and specific facts therein (if any) on which you rely. (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. (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. (m) Do Applicants believe that radiation exposure (i) plays no role in (ii) may enhance (iii) can enhance (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. (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) ? (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. (p) is there any other basis for your answer to 37-B-4(c) than given in your response? If so, please state all such additional basis.

37-B-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? (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.
(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?
(d) Do Applicants have any opinion as to how much electricity generation a person's life is worth? (e) Do Applicants have any opinion as to how much additional capacity on the CP&L system one person's life is worth? (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. (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? (h) If your response to (g)(iii) above is affirmative, how many lives do you think it is worth? (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 x NRC Staff,

37-B-8 continued
(j) continued
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-e) 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 (ee-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-0) 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 estimate or quantify it) of a catastrophic nuclear accident at the Harris site? (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? (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. (m) What are the limits for each subpart of (k) above, in Applicants' view? Please quantify or specify them. (e.g. the limit is 1500 deaths per (i)). (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. (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? (p) Please state the number (if any) which is asked for each subpart of (o) above (3 x 4 = 12 parts). (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.

37-B-8 continued
(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? (s) For each part of (r) above (3x3=9 parts) please state the number or 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. (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. (u) Are you glad this is the last interrogatory in this set? (Answer optional--no motion to compel will be made on this part (u)!!)

REQUEST FOR PRODUCTION OF DOCUMENTS

I hereby request that Applicants make available to me within 30 days of the date hereof (7-20-83 is today) for inspection and copying an original or best copy of all documents identified in response to the above interrogatories, at a time and place mutually agreeable, for sufficient time for me to review the documents.

Wells Eddleman

Wells Eddleman