

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'83 APR 26 110:17

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*
to Applicants Carolina Power & Light et al. *Contentions 29, 37B,*
(*Second Set*) *64F and 67.*

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, NCFMPA, any other or any contractor or consultant to any, some or all of those, Applicant, 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 *(where "Them" refers to the preceding listing(s))* general interrogatories. 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, NPC 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) ^{or relied upon} used 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 to call as an expert witness or expect 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 ~~intend~~ ^{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-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 will be offered into evidence by Applicants, and (i) 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.), 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(a) above. (ii) Please identify for each such person what information was supplied, and with respect to which contention(s) ~~xxxx~~ information supplied was used. (iii) Please state all known qualifications of each such person with respect to the subject matter of the ~~xxxxxxxxxxx~~ 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 ^Nintend to use in making their case or carrying their burden of proof in this proceeding, ~~xxxx~~ 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 March¹⁰ 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.)

Eddleman interrogatories to Applicants (2d set, 1st round). Please note that the general interrogatories supplied with the first set are continuing, as written, and apply to contentions as discovery on them comes open under the Board's 3-10-83 order; however I am supplying a copy of the general interrogatories (revised per my 4-8-83 discussion with Applicants' attorneys O'Neill and Carrow) at Applicants' request here "because (they) don't like to compare documents" and intend to continue to do so, assuming thereby that the general interrogatories and first group of ~~xxx~~ other interrogatories on a given contention together comprise the "first round" under that order. I therefore assume responses to the general interrogatories in a set are not due until the responses to given other interrogatories (first group on a given contention) are due, and hereby grant that time to Applicants to respond even if I should inadvertently fail to insert the general interrogatories in any future set of interrogatories. Please note that nothing here affects or impairs the continuing effectiveness of my general or other interrogatories to Applicants.

FURTHER INTERROGATORIES (2d set, 1st round, environmental contentions and those on which Applicants seek summary disposition):

NB, as used below, "monitor" includes the meanings "detector" and "detection device".
29-1(a) Please identify all radioiodine monitors at Harris which will continuously sample levels of any radioactive isotope of iodine, or any combination of such isotopes, which is located (i) on the upstream side of any filter or device which is designed, or claimed by Applicants, to remove radioiodines from a gas or air stream at the Harris plant; (ii) directly on the downstream side of any such filter or device per (i) above; (iii) on the downstream side of any such filter or device per (i) above before such stream of gas or air (including any contaminants and radioactive materials) merges or mixes with any other vent, duct, room, space or other stream or source of air or gas which originates within the Harris plant containment, spent fuel building, auxiliary building, or other area into which the FSAR or ER contemplates or states that radioiodines can be present during normal operation (including by leaks or accidental transport which does not cause the plant to cease operation); (iv) at any other point downstream of any such filter or device per (i) above but before the release of the air or gas stream (including any contaminants or radioactive material it may include) to the environment; (v) located outside any enclosure or building or vent at Harris but within 10 meters of any designated release point for radioiodines per the FSAR or ER as currently revised; (vi) located more than 10m but less than 100 m from any designated release point per (v) above. (vii) located more than 100 meters from any designated release point per (v) above; (viii) located between two or more such designated release points per (v) above or within 100 meters of more than one release point, giving for each such continuously sampling monitor its distance from each release point it is within 100 meters of; (ix) located outside the exclusion area for Harris; (x) located at the boundary of the Harris exclusion area.

29-1(b) Please identify all radioiodine monitors or samplers at Harris in each of the locations (i) through (x) as stated in (a) above which (i) provide continuous sampling but cannot be read continuously; (ii) provide continuous sampling but must be manually read; (iii) provide continuous sampling but cannot be read without removal of a sample from the monitor or sampler; (iv) sample less than continuously, giving the time periods or pattern of sampling for each; (v) are read other than continuously, providing the method and schedule of reading for each; (vi) provide readouts other than on a continuous basis, stating for each to what places, displays, computers or other equipment the readings are provided, or the data from such monitor or sampler is provided, and the schedule on which it is provided, and the minimum and maximum schedules on which such readout or data is checked by a human being (and which person is to do that, by job description or title if names unknown); (vii) provide other than continuous sampling and are read less often than (aa) once per hour; (bb) once per shift (6, 8 or other designated number of hours per shift, stating the number of hours in each shift and the title or identity of the person to read same and whether plant procedures require such person to make such reading); (cc) once per day (24 hours), stating the title or identity of the person designated to read same and whether Harris plant procedures require such person to make such reading; (dd) once per week; (ee) once per month; (ff) once per quarter; (gg) once per year; (hh) once per refueling cycle, stating the expected length of such refueling cycle; (ii) less often than once per year or once per refueling cycle, stating the time interval specified for such reading, and giving for each of (dd) through (jj) above the information ~~at~~ who (name or job title) is designated by Harris plant procedures to make the reading, and whether the procedures require such person to make such reading within the time stated.

(viii) for each person (or job title) stated or listed in response to (vii) above (and all parts or any part thereof), state what the level of radioiodine reading is at which that person must take additional action, and what action plant procedures require that person to take if the radioiodine reading is at or above that level. (viii-aa) If there is more than one level of radioiodine reading at which a person making or checking the reading (per vii above's answers you have provided) would have to take a different action, please specify each such action and the minimum level of radioiodine reading that requires such action.

(c) for each radioiodine monitor or sampler (or other radioiodine detector) identified in response to any part(s) or (b) or (a) or both above, please state (i) whether Applicants have independently determined the accuracy of such device, monitor, sampler or detector : (ii) if response to (i) above is affirmative for any such thing, state exactly how the test was done, what the acceptance criteria were, whether the acceptance criteria were established before, during or after the test, who established the acceptance criteria, the method of the test, who conducted the test, and the qualifications of each person who conducted the test or established acceptance criteria for such test to perform such work or make such test or determine such criteria; and to identify all documents which include the method(s), acceptance criteria, lab notes, results of such test, limits of accuracy of the test itself, limits of accuracy of the equipment used, calibration of the equipment used, assay of any radioactive material used in the test, calibration of any equipment used in assaying the material used in the test, or potential for error in the test as designed or as conducted, including any deviations from the protocol or procedure for the test which actually occurred during, before or after the test. (iii) If response to (i) above is other than affirmative, please state whether Applicants have any information on the testing of each monitor identified

in response to any part(s) of (a) or (b) above for accuracy (aa) under laboratory conditions, (bb) under plant operating conditions at any other nuclear plant besides Ha_rris, (cc) under other conditions, specifying such other conditions, giving this ~~XXXXXX~~ information for each such monitor, detector, sampler or device.

(d) for each monitor, detector, sampler or device identified in response to (c)(iii) above, please give all information requested for an affirmative response to (c)(i) above, which is requested in (c)(ii) above, for each such device, monitor, detector or sampler on which someone other than Applicants has performed accuracy tests.

(e) what is the maximum level of contamination known to Applicants to have been found in or on any radiation monitor, detector, sampler or other device for detecting radioiodines, identified in response to the above interrogatories or any part thereof, during plant operations at any site other than Harris? (i) what contaminants were involved -- which nuclides in what amounts or concentrations? (ii) how did these contaminants get to such monitor. Please note that this interrogatory applies to the same type and the same model of monitor, detector, sampler or other device for detecting radioiodines which is planned to be used at Harris.

(f) At what pages of the FSAR, in what amendments, have Applicants provided (i) the information promised in item 3 of page TMI-61 of the FSAR as current 5-14-82; (ii) the information for item IV, p. TMI-63 of the FSAR as referenced in (i) above, for steam generator safety relief valve, PORV, atmospheric steam dump valves, and release points of secondary steam from the auxiliary feedwater pump turbine, which is promised in the last paragraph on page TMI-63; (iii) information concerning any other radioiodine release points or potential release points identified by Applicants or NRC staff or others since the TMI Appendix to the FSAR was drafted; (iv) information concerning any other radioiodine release points or potential release points currently known to Applicants in the Harris plant (aa) as designed (bb) as built to date or currently. If any such information is not now in the FSAR, please identify that information, for items i, ii, iii, iv or any or all of them above.

(g) identify the model number, type, manufacturer, and cost of each radioiodine monitor, detector, sampler or device for detection which is included in (i) the FSAR per response to (f) above, or (ii) the responses to (a),(b),(c) or (d) above, which Applicants plan or expect to install, or have installed, at Harris, stating at what location and for what purpose such monitor, detector, sampler or device is installed or will be installed. (iii) for each such item, state whether CP&L or Applicants or their contractors or subcontractors are in possession of the item (monitor, detector, sampler, or other radioiodine detection device).

(h) Are Applicants able to sample every release from ⁽ⁱ⁾the condensate vacuum pump effluent (ii) the atmospheric steam dump valves -- each one, (iii) the steam generator safety relief valves, (iv) the power operated relief valves, (v) the AFW pump turbine potential release points, (vi) the other potential or actual radioiodine release points identified in (f)(iii) or (iv) above, (aa) continuously for radioiodines? (bb) for (i) through (vi) above, other than continuously for radioiodines, stating how and how often such sample will be taken, and how many samples can be taken simultaneously and how many persons are required to take each such sample and how those persons will be shielded from radioactivity. (cc) please identify, for each release point in (i) through (vi) above, which nonsampling monitors or detectors will be used at Harris for each such point, whether such device(s) are mobile or fixed at each such point, and how many mobile devices for such use are available at Harris and how many persons are required to use each such mobile device.

29-1(j) ("i" is not used due to possible confusion with ~~subpart~~ other parts)

(i) identify all documents in the possession of Applicants which give actual or estimated radioiodine release rates or total amounts (per year or otherwise) for operating nuclear power plants, particularly VC Summer, North Anna 1, North Anna 2, Robinson 2, Brunswick 1, and Brunswick 2. (ii) if known to Applicants, please state for each plant for which Applicants possess any data on radioiodine releases, whether the monitoring of radioiodines for that plant is continuous at all points of release, including for FWRs every point of release identified in, or in response to, any part of (h) above; (iii) please, if known to Applicants, state the accuracy and testing for accuracy which each radioiodine monitor, detector, sampler or other device at any plant listed in (i) above or identified in response to (i) or (ii) above has been during the entire time for which Applicants have radioiodine release data for that plant, or any part thereof, specifying such part of such time, providing all this information for each plant; (iv) If answer to any part (i), (ii), (iii) or subpart above is other than affirmative, please so state, giving any basis for such answer, and stating which questions or parts of questions above Applicants do not know the answer to.

29-1(k)(i) Have Applicants performed any tests of (aa) vole thyroids (bb) mouse thyroids (cc) rabbit thyroids (dd) deer thyroids (ee) sheep thyroids (ff) cattle thyroids (gg) human thyroids (hh) thyroid glands of any other species, stating which species, in order to establish baseline or background levels of radioiodine around and at the Harris plant site? (ii) If answer to any part of (i) above is affirmative, please state who performed the tests, when, what that person's qualifications were to perform such test, where the organisms whose thyroids were tested came from (location and distance from plant site; within the plant site, distance from the nearest release point identified either in FSAR pages TMI-60 through -63, or other release point identified in response to any part of (h) above), what test was done, the method of such test (or tests), the equipment used in each such test, its calibration, derivation of background counts, sampling technique(s), counting equipment used, how long the counting was done for for both samples and background counts, when the sample counts were performed, when the background counts were performed, all results of such tests, identify all documents, lab notes, data sheets, data recordings, printouts, and other records of each such test, and explain why the method(s) or test(s) used were selected. (iii) do Applicants know if anyone else has performed tests on the thyroids of any species inquired about in (i) above within 50 miles of the Harris site (aa) prior to 1970 (bb) prior to 1974 (Oconee plant operation) (cc) prior to 1975 (Brunswick 2 operation) (dd) prior to 1977 (Brunswick 1) (ee) prior to 1981 (McGuire 1 operation; (ff) after 1-1-81; (gg) after 12-1-81. (iv) if response to any part of (iii) above is affirmative, identify such person and state if known, what tests were done by that person and when. If the data of tests done by any person known to Applicants to have tested thyroids of any species within 50 miles of Harris is unknown, please identify the person and say that the date of the tests is not known. (v) Do Applicants have a position as to whether radioiodine levels in thyroids are an appropriate measure of radioiodine levels to which organisms in the environment are exposed? (vi) If answer to (v) is affirmative, please state ~~xxxx~~ Applicants' position. (vii) Do Applicants know whether any other electric utility has taken a position concerning whether radioiodine levels in thyroids are an appropriate measure of radioiodine levels to which humans and/or other organisms in the environment are exposed. (viii) If answer to (vii) is affirmative, please identify each such electric utility and state its position or identify any document in which such position is stated.

29-1(m) Do Applicants possess any data as to the amount of radioiodines detected in the environment within 50 miles of (i) their Brunswick plants (aa) on land (bb) in rivers (cc) in the ocean (dd) elsewhere within 50 miles of Brunswick plants; (ii) within 50 miles of the HB Robinson plant; (iii) within 50 miles of the VC Summer nuclear plant; (iv) within 50 miles of the North Anna nuclear plants; (v) within 50 miles of any Westinghouse PWR plant not inquired about above in (ii), (iii) ~~and (iv)~~; (vi) within 50 miles of any power plant which uses the same types or models of radioiodine monitors which Applicants plan to (or have installed) install at Harris? (vii) If the answer to any of parts (i) through (vi) above is affirmative, please state the identify of the plant, identify the data Applicants possess, and identify all documents Applicants possess which contains such data.

29-1(n) Do Applicants know whether the same (i) types (ii) models (iii) series (iv) design of radioiodine (aa) monitor (bb) detector (cc) sampler (dd) other detection device ^{used or to be used at Harris} are installed at any other nuclear power plants (xx) in the US (yy) outside the US? For each response to the above 4 by 4 by 2 element set of questions, if the response is affirmative, please identify each power plant and which type, model, series, or design of radioiodine detection device (including monitors, detectors and samplers) is used there. The insertions in the third line of this interrogatory reads "used or to be used at Harris" and follows the word "device" in that line. That should clarify the question, as it is not clear the insertion will be readable otherwise.

29-1(o) Do Applicants know of any operating nuclear power plant (i) in the US, (ii) outside the US, for which every possible release point for radio-iodines is continuously monitored? (iii) if answer to (i) or (ii) above is affirmative, please identify such plant and all documents in possession of Applicants which confirm or support such answer; (iv) if Applicants answer to either (i) or (ii) above is negative, have Applicants inquired as to this matter of continuous radioiodine monitoring at all possible release points for any nuclear plant? (v) If answer to (i) above is other than affirmative, please answer question (iv) above also, if answer not already given. (vi) please list every utility or power plant for which Applicants have inquired about radioiodine monitoring at, in any way, since March 28, 1979. (vii) for each plant or utility listed in response to (vi) above, please state the inquiry made, how made, when made, by whom made, and the answer or response received, identifying all documents which contain such inquiry or response or were supplied in response to such inquiry.

29-1(p) Please state exactly how Applicants derived their revised iodine source term conveyed to NRC Staff, including (i) whether there was any change in assumed core inventory of radioiodines in making this revision (ii) if answer to (i) above is affirmative, the exact changes made, and all reasons for making such changes, and all documents, experts, opinions and other information relied upon in making such change; (iii) whether there was any change in the transfer of radioiodines assumed in revising the source term; (iv) If answer to iii is affirmative, what changes were made, why, all reasons for making each such change, and all documents, experts, opinions and other information that were used in making each such change (v) the derivation of the core inventory of radioiodines, and all experiments, analyses, calculations, and other basis of such core inventory that are known to Applicants for radioiodines; (vi) any assumptions about radioiodines used in deriving Applicants' source term which is currently being used in this case, which have not been identified above, stating for each who made the assumption or computation, and the full basis for such assumption; (vii) all other facts used in deriving the radioiodine terms (each of them) in the source term currently in use in this case.

29-1(q) (i) Do Applicants have any information concerning the breakdown of or any failure of filters or other devices used to remove radioiodines from any nuclear power plant's effluent streams prior to release into the environment; (ii) If answer to i is affirmative, please state such information and identify all documents in possession of Applicants which contain such information; (iii) Do Applicants have any information on the failure of sealers or gaskets in connection with any failure or breakdown identified in (i) above? (iv) If answer to (iii) is affirmative, please identify all such information and all documents containing it, and state such information succinctly. (v) what is the exact limit on radioiodine releases for each isotope of iodine during normal operation of the Harris plant per (aa) technical specifications as proposed by Applicants (bb) technical specifications proposed by NRC (cc) license condition Applicants plan or expect to accede to; (dd) plant procedures; (ee) please state which limits identified above are enforceable by NRC; (ff) please state any other limit for each radioiodine isotope, or all radioiodine isotopes together, for emissions from the Harris plant, which Applicants believe or know will apply to Harris, in curies per year or any other appropriate measure in which such limit is expressed.

29-1(r)(i) please list the contribution to the Harris source term for each radioiodine isotope from each release point identified above, including all those mentioned in pages TMI-60 through TMI-63 of the FSAR as it stood 5-14-82, and all those additional release pathways identified in response to interrogatory (f)(iv) above or otherwise known to Applicants at present. (ii) for each pathway (ie. pathway passing ~~xx~~ through a release point inquired about in (i) above) for which the amount of radioiodine passing through that point is not known for any radioiodine isotope, please list that isotope and state that Applicants do not know the amount of (isotope) released through that point or pathway. e.g. Applicants do not know that amount of I-129 released through atmospheric steam dump valve 7" (if that is the case). (iii) please list all iodine isotopes not identified in the Harris source term (iv) please list all isotopes of elements other than iodine, which are produced in nuclear fission or expected to be produced by the Harris core, which decay in any proportion into radioiodine isotopes. (v) for each isotope listed in response to (iv) above please state the half-life of the decay into radioiodine (aa) directly (bb) into any other isotope which eventually decays into a radioactive isotope of iodine, and please state the proportion of ~~xxx~~ decays identified above (for each such decay) that (cc) result in a radioiodine isotope, or (dd) result in an isotope which decays further by one or more steps into a radioiodine, in any proportion. (vi) please identify which of the isotopes identified in response to (iv) above will be released from Harris, stating which are in the current Harris source term and which are not.

29-1(s) please identify all (i) gaskets (ii) seals (iii) flexible mounting material (iv) other mounting material (v) other components, which are used ^{or to be used} in (or to seal) the air streams at Harris which may contain or are expected to contain radioiodines, or which are adjacent to any traps, filters, or other devices for removing radioiodines from Harris gaseous effluents, which are made of (aa) polyethylene, (bb) polyvinyl chloride (PVC) (cc) ethylene propylene rubber (dd) neoprene (ee) crosslinked polyolefin material (ff) chloroprene (gg) chlorosulfonated polyethylene.

29-1(t) identify (i) all components identified in response to (s) above for which Applicants have performed any analysis of (aa) swelling (bb) embrittlement (cc) reduced elasticity (dd) reduced tensile strength (ee) oxidation (ff) oxidation in conjunction with radiation and heat (fgg) swelling associated with heat, radiation, and reduced oxygen (hh) uptake of moisture (ii) permeability to radioiodines (jj) diffusion rate of radioiodines in such material. (ii) all documents Applicants possess which provide any analysis of the above for any material listed in (s) above, with respect to any matter in (i) above.

- 29-2(a) Please specify the accuracy of the wind speed indicator used to collect meteorological data at the Harris tower for use in the ER and licensing of the Harris plant. (b) please state when such accuracy was last tested, and how, and what the accuracy was at (i) wind speed below 1 mph; (ii) wind speed 1-4 mph (iii) wind speed 5-9 mph (iv) wind speed 10-14 mph (v) wind speed 15-19 mph (vi) wind speed 20-24 mph (vii) wind speed 25-29 mph, (viii) wind speed 30-39 mph, (ix) wind speed 40-49 mph (x) wind speed 50 mph and over; (xi) any other specific wind speed at which accuracy was tested. Please give the accuracy as determined, whether that is in percent, plus or minus speed, of however it was determined, in whatever units accuracy was determined.
- (c) please state when such accuracy (per (a) above) was first tested, by whom, by what method, and what the results were, including responses to items (i) through (xi) of (b) above for this first test. (d) please identify all documents which incorporate data or results of tests inquired about in a, b, or c above.
- (e) please state how the accuracy of the wind direction indicator at the Harris site has been tested, and when, and what accuracy was determined for it, at all times of testing of its accuracy since such indicator began operating.
- (f) if more than one wind direction indicator, or more than one wind speed indicator, has been used for Harris meteorological data, please answer all parts and subparts of a through e above for each such indicator, identifying the indicator and its time in use (starting and ending date and time) if such information is not already given above.
- (g) Please state all sources of meteorological data in possession of CP&L other than Harris tower weather data, which were used by Applicants in computing or estimating radioiodine concentrations in the environment during Harris operation.
- (h) please identify all documents in Applicants possession which give the time, amount, duration, intensity, or other information concerning rainfall or snowfall or other precipitation for any location or locations within 50 miles of the Harris plant, indicating for each the year and date such information begins, the location, the method by which the data was collected, and any determination of the accuracy of such data which Applicants have made.
- (i) Please identify any data Applicants possess on the actual diffusion pattern of (aa) I-131 particles (bb) I-129 particles (cc) other radioiodine particles (dd) organic iodine (ee) nonradioactive iodine particles (ff) non radioactive hypoiodous acids (gg) other forms of iodine around the Harris plant. Please identify all documents in which such data is contained and state how and when and by whom such data was collected, including methods used and percent of iodine released that was traced, and any data showing the distribution of iodine in (gg) air (hh) soil (ii) water (jj) buildings (kk) crops (ll) forage or pasture (mm) grass (nn) other stopping points, e.g. cars, residences, schools, etc. that resulted.
- (k) Please identify any studies of the actual diffusion of (i) gaseous iodine (ii) air (iii) other gases, which Applicants have performed at the Harris plant, of (iv) which Applicants are aware of at any nuclear or other power plant.
- (v) please identify all documents which contain the results or methods of such study for each such study, which Applicants possess or are aware of.
- (1) Please identify any actual tests of diffusion of (i) iodine as a gas (ii) iodine particles (iii) organic iodine (iv) HOI (v) other iodine compounds which have been conducted (vi) from any release point of the Harris plant identified in response to interrogatory 29-1 above, or inquired about in interrogatory 29-1, e.g. at (f) therein, stating for each test whether the iodine was radioactive or not, and if radioactive, what isotopes and what amounts were released. (vii) please identify all documents in which the methods of any tests, the results of any tests, or accounts or records of any test identified in response to items in (1) above (i thru vi or any of them) are contained, who performed the tests, who set the criteria for the test, who chose the method of the test, when the test was done, and who ordered the test.

29-3(a) Is the source term identified in response to 29-1(p) above the one used to derive the values for expected concentrations of radioiodines in the cooling tower blowdown (Table 5.2.2-3a) or main reservoir (Table 5.2.2-3b) (ER) for Harris? (b) If answer to a is affirmative, is it for both or just one, and which one? (c) Is any of the concentration of radioiodines Applicants project for the reservoir or for the cooling tower blowdown due to atmospheric transport of radioiodines? (d) If answer to c is affirmative, please state exactly how much radioiodine which has been in the air before ending in the (i) reservoir (reservoir) and (ii) cooling tower blowdown. (e) identify all other release pathways or mechanisms whereby radioiodine can get into (i) the Harris reservoir, or (ii) the cooling water circulating through the cooling towers, stating for each all assumptions that affect Applicants estimate of the radioiodine released in each pathway, the reasons and data which support those assumptions, and the amount Applicants estimate will leak out through each such pathway (iii) for all radioiodines together, (iv) for each radioactive iodine isotope.

(f) Please identify all documents which Applicants rely on or have used in making calculations or in answering the questions above re radioiodine release from Harris to (i) cooling tower blowdown, (ii) the main reservoir, (iii) cooling tower circulating water, stating how each was used and what facts in each were relied upon.

(g) Please identify all other information, expert opinion, or other facts not identified in response to any of (a) through (f) above which Applicants rely on or use in estimating radioiodine releases to the (i) reservoir, (ii) cooling tower circulating water (iii) cooling tower blowdown.

(h) what amount or curies of radioiodines do Applicants project will be released from the cooling towers at Harris other than by blowdown?

(j) do Applicants plan to monitor the cooling towers for radioiodines?

(k) If answer to (j) above is other than affirmative, please state all reasons for your answer.

(l) what effect does moisture in the cooling towers have on Applicants' ability to monitor radioiodines inside the cooling towers or in their release to the atmosphere? (ii) do Applicants have any instruments capable of detecting radioiodines in the moist air/vapor/droplet mix to be found inside the cooling towers? (iii) do Applicants have any instruments capable of measuring radioiodines at the top of the cooling tower(s)? (iv) please identify each such instrument, state how its accuracy varies with moisture as humidity and as water droplets, identify any tests substantiating such statements re accuracy variation with humidity and exposure to water droplets, for any instrument which is inquired about in (ii) or (iii) above and all such instruments.

(m)(i) Does the release of liquid radioactive waste into the main reservoir at Harris count in Applicants estimates of radioiodine in the reservoir?

(ii) If response to (i) above is affirmative, please state how much radioiodine, for each iodine isotope, is expected to be released into the reservoir as liquid (aa) per year (bb) over the operating life of one Harris unit (cc) over the operating life of 2 Harris units, as estimated by Applicants. (iii) Identify all documents and calculations and assumptions made by Applicants in producing the information supplied in response to (ii) above, stating who made the calculations and assumptions, and what the basis of each assumption is, identifying also any documents which support the basis of each assumption.

(iv) do the responses to (ii) and (iii) above use the same source term Applicants identified and answered with respect to in Interrogatory 2901(p) above?

(v) If response to (iv) is other than affirmative, identify what source term was used and give its complete derivation. (vi) If not already identified in response to (i) through (v) above, state all radioiodine pathways to the (aa) main reservoir (bb) cooling tower which Applicants have identified in their analysis of radioiodine releases.

29-3(n) (i) please identify all documents which give (aa) test data, or (bb) operational data for nuclear power plants of PWR type ^{and} Westinghouse NSSS (cc) or operational data for other PWRs, or (DD) operational data, for BWRs, showing the amount or percentage of each radioiodine isotope which is trapped by (ee) the liquid radwaste processing system to be used at Harris, or a substantially equivalent system (ff) the filters or radioiodine absorbers or traps to be used at Harris (gg) the substantial equivalent of such filters (hh) the substantial equivalent of such absorbers (jj) the substantial ~~x~~ equivalent of such traps.

(ii) please state for each document identified in response to (i) above how the radioiodine concentration was measured for each isotope (aa) before and (bb) after going through the radioiodine absorption device or system used (as described in i (ee) through (jj) above or otherwise, noting what other absorption device or system was used if it is not one of those in (i) above).

(iii) please state the calibration method used, how long before the test it was used, and the accuracy found, for each device used to measure the radioiodine concentrations inquired about in (ii) above. If you don't know, please so state.

(o)(i) Does CP&L possess a copy of each document which describes the exact method CP&L used to calculate concentrations of radionuclides in the main Harris reservoir? (ii) If response to (i) is other than affirmative, please list each document which describes such method and state whether Applicants possess a copy of it. (iii) If response to (i) above is affirmative, please list each such document. (iv) please state how the method inquired about in (i) above was determined to be Applicable to the Harris reservoir, and what limitations the method has, if any. (v) please state whether CP&L or Applicants have done any study of the actual stratification or actual degree of annual turnover in the Harris reservoir. (vi) if answer to (v) is affirmative, please identify each such study, who did it, when, any documents which (aa) request the study, (bb) plan the study (cc) include field notes or data from the study (dd) all results of the study (ee) all data collected from such study. (vii) Have Applicants done or had done any dye-tracer or other tracer study of the Harris reservoir and circulation of water in it? (viii) If answer to (vii) is affirmative, answer all parts of (vi) above for each such study, and please also state what method, if any, was used to simulate Harris plant water withdrawals and discharges in operation in such study, including the actual withdrawals and discharges of water made, or any assumptions involved in such simulation, for the study.

(ix) was any dye tracer study or other empirical study of Harris reservoir used by Applicants with respect to radioiodine level computations for the ER?

(x) If answer to (ix) is affirmative, please identify any such study not already identified in response to the above questions, and state for each all the information requested in (vi) above. Wherever information in (vi) is requested with respect to any answer other than that to (v), the language about (v) being affirmative which is contained in the text of (vi) above should be ignored.

(p)(i) Have Applicants performed any ^{study} analysis or experiments as to the chemical interactions or reactions or (aa) elemental iodine (bb) organic iodine (cc) HOI (dd) other iodine compounds in either (ee) the Harris cooling tower system, or (ff) the Harris reservoir? (ii) If answer to (i)(ee) or (i)(ff) above is affirmative, please identify any such study, analysis or experiment, state who did it, when, who ordered it, the methods used, identify all documents requesting the study, planning it, giving the methodology used, stating the field notes or lab notes from such study, workpapers from the study or analysis or experiment, or which give the results of such study, analysis or experiment of the data used or collected in such study analysis or experiment.

29-3(p) continued

(iii) please state exactly how the results of ^{each} ~~any~~ experiment, study or analysis identified in response to (ii) above affects the concentration of radioiodine in (aa) the Harris cooling tower blowdown (bb) the Harris reservoir (cc) the air above the cooling towers when they are in use (dd) the air over the HARRIS reservoir, or air moving across the reservoir surface (ee) bottom sediment at Harris reservoir or in it.

(iv) please identify any studies Applicants have performed of radioiodine uptake of algae or aquatic weeds in the Harris reservoir or downstream of it, including all documents that request or contain the results of such studies.

(v) please identify any other studies of radioiodine uptake by algae which Applicants rely on in their analysis of radioiodine doses to humans from Harris.

(vi) please identify all information or studies on the water/air - aquatic weed - waterfowl - human pathway for radioiodine uptake which Applicants have used or rely on for Harris. (vii) for each study identified in (v) or (vi) above please state who did it, when, whether Applicants have any documents that contain the study, whether Applicants have any documents that contain the results, and identify all documents containing information requested in this subsection (vii) as well as information requested in (v) or (vi) above.

(viii) please identify any information concerning iodine concentrations in food chains beginning with algae upon which Applicants rely in computing or estimating radioiodine doses to humans. Please provide all information in the second and third lines (1st and 2d full lines) of vii above for all information identified in response to this subsection.

29-4(a) Do Applicants consider a site emergency at Harris to be included in "normal operation"? (b) Do Applicants consider a general emergency at Harris to be included in "normal operation"? (c) Do Applicants consider a site alert at Harris to be included in "normal operation"/ (d) Do Applicants consider "normal operation" at Harris to include all conditions which are not defined by NRC as emergency situations on one of the 4 levels (up to general emergency)? (e) what is the maximum condenser leakage possible at Harris in "normal operation"? (f) what is the maximum primary-to-secondary system leakage at Harris that is normal operation? (g) what is the maximum primary to secondary leakage at Harris for which the plant can continue to operate (i) ~~indefinitely~~ indefinitely (ii) for more than one week (iii) for more than 72 hours (iv) for more than 48 hours (v) for 48 hours (vi) for 24 to 48 hours (vii) for less than 24 hours? (g) (viii) please state any power limitations that apply to the responses to (i) through (vii) or any of them. (h) what is the maximum radioiodine level in primary coolant allowed at Harris in normal operation? (j) Is there any level of radioiodine or of any isotope of iodine in Harris primary coolant that requires or forces the plant to be shut down, by rule, procedure, or otherwise? (k) If answer to j above is affirmative, please state each such level that may require the Harris plant to shut down, giving the highest such level which requires plant shutdown (i) by NRC regulation (ii) by plant operating license condition (iii) by plant operating procedure (iv) otherwise. (l) Is there a minimum or maximum level of radioiodine in the Harris condenser which would require the plant to shut down? (m) If answer to l is affirmative, what is that level, and is it a maximum or a minimum? (n) what is the maximum amount of fuel or percentage of fuel that can fail (i.e. be leaking from fuel rods) at Harris (i) without the plant being shut down by NRC rule or regulation (ii) without the plant being shut down by license condition (iii) without the plant being shut down by CP&L rule or procedure (iv) without being known to plant operators in normal operation (v) allowed in normal operation?

29(4) continued

29(4) (o) please give responses to all parts of (e) through (n) above with respect to Applicants; Robinson 2 plant instead of Harris, i.e. answer all such parts with the words "Robinson 2" replacing "Harris" wherever the word "Harris" occurs therein.

29-5(a) for each filter, trap or other component at Harris (or in the Harris design) which Applicants intend or expect to remove radioiodines from the effluents of the plant, please state the following: (i) the maximum amount of each radioiodine isotope such component can absorb or remove from effluents, stating from which effluents radioiodine is to be removed; (ii) the maximum amount of all radioiodines together which such component can remove from each effluent (e.g. water, air); (iii) the exact effect of humidity on such component's ability to absorb, trap or remove radioiodines from effluents; (iv) if the effect described in response to (iii) above is different for any radioiodine isotopes, please state all such differences for each isotope compared to (aa) I-129 and (bb) to I-131; (v) a list of all conditions known to Applicants which can or will render such component inoperable; ~~xx~~ (vi) a list of all conditions known to Applicants which can or will prevent such component from removing radio-iodines (aa) at its full rated ability; (bb) at any level above 75% of its full rated ability; (cc) at any level above 50% of its full rated ability; (dd) at any level above 25% of its full rated ability (ee) at any level above 10% of its full rated ability; (ff) at any level above 5% of its full rated ability; (gg) at any level above 1% of its full rated ability. Full rated ability means its normal ability (in amount, or in %, of radioiodines passing such component or input into it or past it) to remove radioiodines. (vii) If any of the responses to any parts of (v) or (vi) above or to (v) above or (vi) above entire, would vary with radioiodine isotope involved, please state all such variations (i) as compared to I-129; (ii) as compared to I-131. (viii) If Applicants do not have the above-requested information for any specific radioiodine isotope, or all radioisotopes, of iodine, please state all information Applicants do have, responsive to any part of (a) above, for any or all radioiodines, identifying the interrogatory to which each such answer is responsive.

29-6(a) Are all maintenance and technical specifications and procedures, ^{and} design data, related to radioiodine filters, traps, absorption or removal devices, and monitoring at Harris given in the FSAR and the ER? (b) If response to (a) is other than affirmative, please identify all documents which contain such information, detailing for each the information it contains which is inquired about in (a) above. (c) If response to (a) above is affirmative, please identify the sections of the FSAR, and of the ER, in which such information is contained, ~~xxx~~ stating what information is contained in each (e.g. FSAR X.Y.1.3.1 contains the description of all radioiodine traps and their design) (d) If response to (a) above is other than affirmative, please provide the information requested in (c) above for all data requested in (a) above which is in the FSAR or the ER. (e) Identify any other information relating to radioiodines which is in the FSAR or ER and was not requested above, stating where such information is located, in the FSAR or ER. (e.g. FSAR Y.X.1.1.1 has the radioiodine source term, and Y.X.1.1.1.3(b) has the derivation of that source term, for all radioiodine isotopes). (f) please describe all mounting or sealing gaskets, frames, and devices to be used in connection with (i) radioiodine-absorbing filters (ii) other devices used to remove or trap gaseous or liquid radioiodines (or radioiodine particulates) from effluent streams (air or liquids or other material moving toward or to a discharge point, directly or indirectly) at Harris, giving the following information for each: (iii) the material and manufacturer, (iv) the dimensions (v) the mounting or attachment of such gasket, frame of device, (vi) what it is mounted ~~on~~, or in, or attached to (vii) if it is not attached

29-6(f) continued

please describe how it is kept in place, what it rests on, and how it may be removed; (vii) what parts of it are in contact with effluents, giving dimensions and describing which parts are in contact, if any; if none, so state; (viii) whether Applicants have determined the (aa) maximum, (bb) typical or average, (cc) minimum radiation exposure to which such mounting, or sealing gasket, frame or device will be exposed in normal Harris operation; (ix) whether Applicants have determined or know the (aa) maximum (bb) normal or average, (cc) minimum concentration of (xx) oxygen (yy) nitrogen (zz) water, (ww) particulates to which such device will be or is expected to be exposed in normal Harris operation; (x) For each such device being described in response to this interrogatory (f) and its parts above, please give each determination which Applicants have made or know, which was inquired about in (ix) above. (xi) Have Applicants done any study of embrittlement of gaskets or seals in the Harris plant due to exposure to (aa) radiation (bb) oxygen (cc) both radiation and oxygen (dd) radiation at doses below or equal to those stated for any component or device in response to (x) above? (xii) If answer to any part of (xi) above is affirmative for any device, or component, then for each such device or component please identify (aa) all documents concerning the study or containing the results, or methods, or records of such study; (bb) the authors of each such document identified in response to (aa) above; (cc) the qualifications of each such author; (dd) all instruments or equipment used in such study; (ee) which documents contain the results of the study; (ff) what uncertainty was determined to be in those results. (xiii) what the design life of such component, device, gasket or sealing device is; (xiv) what schedule such component, device, gasket, or sealing device will be replaced on, according to Applicants' current plans; (xv) the radiation exposure to personnel involved in such replacement, per device, if Applicants have made a determination or estimate of such exposure; (xvi) the internal and external radiation in any determination or estimate given in response to (xv) above, including which radionuclides, if any, are expected to be deposited internally in any person replacing such device. (xvii) the failure rate of such seal, gasket, or mounting or sealing device estimated by Applicants; if no estimate made, so state; if actual data used to give failure rate, identify source of data and all documents containing such data; (xviii) identify all documents containing actual or estimated failure rate of such component, or estimated lifetime of such component without failure. @"Failure" means failing to perform its function, e.g. leaking for gaskets, seals and sealing devices.

29-7(a) What is the minimum configuration of radioiodine absorbing, trapping or filtering devices at Harris which is allowed during normal operation? Please list each component or device in this configuration, and the number of each required to be operable at all times during normal operation. (B) On what schedule is the operability of each component listed in response to (a) above to be verified, and by whom. (please state for each such component, including all devices and components identified in response to (a) above). (c) who is responsible for each such verification? (d) must the plant (Harris) be shut down if such verification is not made? (e) please list all such verifications which, if not made, will (i) cause the plant to be shut down; (ii) cause the plant to be derated, giving the derating required, (iii) require the plant to be shut down; (iv) require the plant to be derated, giving the derating required. (f) please give the schedule on which each component identified in response to (a) above is to be replaced at Harris; (g) please give the schedule on which each component identified in response to (a) above will be serviced, stating all actions to be taken and all checks to be made in servicing same. "schedule" as used herein means any times (e.g. 3 times per year, during each refueling outage, before every plant startup from cold shutdown, etc., as well as any schedule giving exact dates or approximate dates.

29-8(a) Please identify all materials used in (i) radioiodine-trapping filters for use at Harris (ii) mountings of such filters (iii) gaskets or seals for such filters (iv) maintaining airtight conditions in air or gas pathways at Harris where Applicants expect that radioiodines may or will be present.

(b) please state which of the above materials incorporate (i) polyethylene, (ii) polyvinylchloride (PVC) (iii) chloroprene (iv) ethylene propylene rubber (v) neoprene (vi) crosslinked polyolefin materials (vii) chlorosulfonated polyethylene (viii) any other rubber (ix) any other polymer (x) any flammable material, including any of the preceding.

(c) please state whether Applicants have determined (i) the tensile strength, (ii) the change in tensile strength when exposed to radiation and oxygen, (iii) the swelling when exposed to radiation and lower oxygen levels than 21% (iv) the change in tensile strength when exposed to radiation and then to heat (v) the swelling when exposed to radiation, heat, and oxygen levels below 21% (vi) the tendency to crack (vii) the speed of oxidation at the temperatures such material is expected to be at at Harris, for each material identified in response to (a) above.

(d) please state whether Applicants have analyzed the effect of fires at Harris on the oxygen concentrations to which each of the materials identified in response to (a) above are exposed. (e) for each material for which your response to (d) is other than affirmative, please state any information in possession of Applicants, not already identified in response to other interrogatories, which gives for that material any of the properties (or characteristics, if you will) listed as (i) through (vii) under (c) above; including the identification of each document containing information, which of the things listed as (i) through (vii) of (c) above it contains, on what page, who wrote it, and when.

(f) for each material for which your response to (d) above is affirmative, please state whether Applicants have any of the information about the properties (i) through (vii) of (c) above. (g) Identify which information, and all documents containing that information, Applicants possess, for each affirmative response to (e) above for each material.

37-B-1(a) Please identify or list all diseases which Applicants have estimated the increased incidence of due to operation of the Harris plant, including those which have been specifically calculated for increased incidence ~~which~~ for which Applicants have calculated there will be no increase.

(b) identify, for each such disease, (i) all documents wherein such estimate or calculation was made, (ii) all documents and information relied upon by Applicants in making such calculation or estimate, (iii) who made the calculation and state when such calculation or estimate was made, and who made the estimate (if not already stated), (iv) any estimate known to Applicants for (aa) the increased incidence of such disease due to Harris operation (bb) the value of any number, factor or relationship used in making Applicants' calculation or estimate, (cc) any other information relative to the increased incidence of such disease due to external or internal radiation or radionuclides, which (for (aa) through (cc) or any of them) is higher than the Applicants' calculation, estimate, or of which would increase Applicants' estimate if it were used in making such calculation or estimate.

(c) Please identify all information in the possession of Applicants which alleges or states that ~~NRC~~ (aa) NRC (bb) BEIR-III or the BEIR Committee (cc) Applicants (dd) EPA (ee) NRC models (ff) Applicants' models or calculations: (gg) underestimate radiation exposure to (i) human beings or a human being; (ii) animals (iii) ~~g~~ food crops (iv) ~~x~~ air (v) water, within 50 miles of Harris, or in connection with operation of any other nuclear power plant, (hh) underestimate the incidence of any disease due to exposure to radiation or any radioactive material listed in 10 CFR 20 and its appendices.

(d) please list all diseases for which any information was identified under (c)(hh) above.

37-B-2(a) For each document identified thus far by Wells Eddleman in response to Applicants interrogatories concerning Eddleman contention 37 B, please state (i) whether Applicants possessed a copy of such document before Eddleman made same available to them (or, for documents not made available by Eddleman, whether Applicants possessed a copy of same before Eddleman's responses to interrogatories, ~~how~~ in which he identifies such document, were received by Applicants); (ii) whether Applicants have made any analysis or study of such document; (iii) for all affirmative responses to (ii), and each of them, who made the study, when, who ordered the study (if anyone), the results of such study, the identity of all documents containing the results of such study, and whether Applicants intend to offer such study into evidence, in this proceeding (iv) for all responses to (ii) above which are other than affirmative, whether Applicants possess any study, response, critique, or analysis of such document made by anyone else other than Applicants; (v) for all affirmative responses to (iv), please state the information requested for affirmative responses to (ii) in (iii) above: e.g. who made this study, response, critique, or analysis, when, etc. including whether Applicants plan to offer such study, response, critique or analysis into evidence in this proceeding.

37-B(3)(a) Please list all diseases and other health effects (including deaths) which Applicants, in their ER, have considered or mentioned. (b) Please state which, if any of the diseases and health effects identified in response to (a) above Applicants believe can be caused by radiation (ii) radioactive material emitted from the Harris plant. (c) please state if Applicants considered radioiodine doses to fetuses in their ER. (d) If response to (c) is affirmative, please state at what page(s) such doses were considered.

37(B)(3) continued

(e) Please list all diseases Applicants believe can be (i) caused by radiation, (ii) contributed to by exposure to radiation (iii) contributed to by exposure to low-level radiation (iv) caused by exposure to low-level radiation (v) made more severe by exposure to low-level radiation (vi) made more severe by exposure to radiation. (f) For each disease listed in response to (e) above for which Applicants have not made an analysis of the increased incidence of such disease to be expected due to the operation of the Harris units, please state all reasons, facts, and opinions held by Applicants to support their not having made such analysis in the ER. (g) please list all genetic defects and genetic diseases which Applicants believe CANNOT be caused by exposure to radiation in (i) one parent (ii) both parents (iii) any ancestor. (h) please list or define all diseases which Applicants believe CANNOT be caused by radiation. (j) please list or define any disease not heretofore identified which Applicants believe can be caused by radiation. (k) for each disease listed or defined in response to (g) or (h) above (or both), please state the basis of Applicants' belief that such disease CANNOT be caused by radiation, including all documents, experts, and information relied upon by Applicants in forming, supporting, holding or maintaining that belief.

37(B)(4)(a) For each disease which Applicants have above stated can be caused by radiation, in response to any interrogatory above, please state whether Applicants believe (i) that such disease can occur among persons within 50 miles of the Harris site (ii) that the victims of such disease undergo pain and/or suffering (iii) that if anyone dies of such disease, that person will have undergone pain and/or suffering (iv) that if anyone lives with this disease chronically active, that such person will undergo pain and/or suffering (v) that if anyone lives with this disease active, that person may have expenses related to (aa) treatment of the disease (bb) pain relief (cc) maintenance of one's person due to incapacitation caused by the disease. (b) please list all forms of mental retardation which Applicants believe CANNOT be caused by radiation, or define all such forms of retardation. (c) please state the basis for Applicants' belief that each such disease identified in response to (b) above cannot be caused by radiation. (d) please list any forms of mental retardation Applicants believe CAN be caused by radiation. (e) please provide the information requested in (a) above ("please state whether Applicants believe (i) disease.") for each form of mental retardation identified in response to (d) above.

64-1(a) please list every valve on the IF-300 series spent fuel shipping cask owned by Carolina Power & Light Company (b) please identify all documents in which the seating mechanism of any such valve is shown or described (c) please identify for each such valve, all documents which describe the valve, which Applicants possess or which are known by Applicants to be on file with NRC. (d) please identify all documents which list or describe the materials of each valve identified in response to (a) above. (e) please identify the chemical constituents of each material which is incorporated in each valve identified in response to (a) above. (f) please identify all fluorocarbon components of each valve in the IF-300 series spent fuel shipping cask owned by Applicants (or by CP&L).

64-2(a) Please state all reasons why the IF-300 series casks are no longer used to ship ~~fuel~~ spent nuclear fuel with water. (b) please state whether Applicants are aware of any finding that valves on the IF-300 series casks (i) would not (ii) might not reseal after opening; (c) please state all conditions under which Applicants believe the valves on the IF-300 cask would open (i) when the cask contains a full amount of water as coolant (ii) when the cask is used "dry"; (d) please state the maximum temperature of spent fuel which a dry IF-300 series cask can handle safely; (e) please state the maximum spent fuel heat generation, in watts thermal, BTUs per hour, of other units of heat generation, which CP&L's IF-300 series cask can handle (i) for a trip of up to 12 hours (ii) for a trip of up to 24 hours (iii) for a trip of up to 48 hours (iv) for a trip of up to 72 hours (v) for holding such fuel within the cask indefinitely. Please also state the temperature outside the cask which is assumed in your answers to each of (i) through (v) above, and the maximum temperature outside the cask for which each such statement (your answers to (i) through (v) above) remain valid. (f) please state the exact basis, and all calculations, which support your answers to each part of (e) above. (g) please identify all documents you rely on for answers to each part of (e) above. (h) please state whether CP&L has shipped fuel dry in the cask CP&L owns (spent fuel).

64-3(a) Is CP&L's spent fuel shipping casks equipped with instruments or gauges which (i) continuously measure the temperature inside the cask (ii) continuously measure the pressure inside the cask (iii) can continuously measure the air pressure inside the cask (iv) can measure the temperature inside the cask on demand (whenever you request a reading) (v) can measure the pressure inside the cask on demand (vi) measure the temperature of the spent fuel inside the cask (aa) directly (bb) indirectly; (vii) measure the pressure inside the cask in any way (viii) measure the temperature inside the cask in any way? (b) If your response to any part of (a) above is affirmative, please state for each part for which your answer is affirmative, what instrument is used, where it is located on or in the cask, what its accuracy is, whether this accuracy has been measured in the time since the cask began service, whether and how this accuracy is affected by radiation inside the cask, or particles of radioactivity inside the cask; whether this accuracy is affected by the use of air, rather than water, as the "filling" of the cask around the spent fuel; whether this accuracy is affected by thermal circulation of air inside the cask, and if so, how, and the identification of all documents in which the information requested above in (b) is contained. (c) does CP&L measure the temperature of air inside its shipping cask during "dry" shipments of spent fuel? Please state how if not identified ~~above~~ in response to the above interrogatories.

64-4(a) Please state the maximum amount of water allowed inside CP&L's spent fuel cask during a "dry" shipment of spent fuel. (b) please state the maximum surface temperature of spent fuel which has been shipped "dry" in this cask to date. (c) please state any temperature which CP&L believes (i) would (ii) could cause any valve on the CP&L IF-300 spent fuel cask to (a) open (b) stick open. (d) are any of the valves on CP&L's spent fuel cask pressure-actuated? If so, please state the pressure at which each such valve is set to open. (e) has the opening pressure for any valve on CP&L's spent fuel shipping cask been changed since the cask was withdrawn from "wet" use and limited to "dry" use? (f) if answer to (e) is affirmative, identify each such valve and the change and original and final setting of its opening pressure.

64-5(a) what material is used in the seals of CP&L's IF-300 series cask (hereinafter, cask, or the cask, or CP&L's cask)? (b) is there any Teflon-like material used in (i) the seals of the cask (ii) the valves of the cask (iii) seals around or in valves of CP&L's cask? (c) identify each such material and what seal or valve it is in, how thick it is, what its dimensions are, and its shape, for any affirmative response to (b) above, for each such valve, or seal, in the cask. (d) please identify the melting point of each material used in any (i) seal (ii) valve in CP&L's cask. (e) please state the variation of (i) tensile strength (ii) elastic modulus (iii) bulk modulus (iv) hardness of each material used in (aa) any seal (bb) any valve of the cask, stating which seals or valves the material is used in, with temperature, from 0 degrees F to the melting point of the material. (f) please identify any documents known to Applicants or in their possession which give any of the information requested in (e) above. (g) does any material used in (i) any seal (ii) any valve of the cask undergo a chemical breakdown or chemical reaction (aa) by itself (bb) with air (cc) with water (dd) with steam at any temperature below its melting point? (h) does any material used in (i) any seal (ii) any valve of the cask not have a melting point? (j) if the answer to (h) is affirmative for any material, please provide for that material answers to (g) through (dd) above, i.e. stating whether such material undergoes any breakdown or chemical reaction without melting, by itself, with air, with water, or with steam, at any temperature.

64-6(a) Do Applicants possess a copy of a document by Pacific Northwest Laboratories entitled An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck? (b) Do Applicants possess any documents concerning spent nuclear fuel shipping casks which refer to "Teflon valve seals"? (c) Do Applicants know if the document inquired about in (a) above refers to "Teflon valve seals"? (d) Do Applicants agree that the valve seal materials used in both truck and rail spent fuel shipping casks are similar? (e) If your answer to (d) is other than affirmative, please state all differences you know in (i) the content of the materials, and (ii) the physical properties of the materials, including melting point. (f) at what temperature do Applicants believe failure of the (i) seals (ii) valve seals on CP&L's cask would occur? (g) Is there any temperature which Applicants believe (i) seal failure (ii) valve seal failure on their (CP&L's) cask could not occur below? (h) If answer to (g) is affirmative, what is that temperature for (i) seals (ii) valve seals (iii) any seal (iv) each seal?

64-7(a) Do Applicants have any data as to the frequency of occurrence of ruptured disks in valves on IF-300 series casks? (b) Do Applicants have any data on seal failures in IF-300 series casks? (c) Do Applicants have any data on whether IF-300 series casks have actually been in fires, or what temperature such casks have reached in fires? (d) If your answer to any of a, b, or c above is affirmative, please identify all documents containing such data.

64-8(a) Do Applicants have any data on actual testing of valves on the IF-300 series casks? (b) Do Applicants have any data on Sandia labs tests of IF-300 series casks? (c) Have IF-300 series casks ever been physically tested for conformity with the requirements of 10 CFR 73.32, 10 CFR 73.31 or 10 CFR part 73 Appendix A or Appendix B? (d) if answer to (c) above is affirmative, (i) was it CP&L's cask, and (ii) which requirements were physically tested for? (e) please identify all documents which contain information inquired about in parts (a), (b), (c) and/or (d) above, stating for each what information it contains.

64-9(a) Do Applicants know if the pressure relief valves on CP&L's cask have ever been tested? (b) If response to (a) above is affirmative, were they tested? when? with what results? did any valve fail to reseal in a test? If so, which ones failed to reseal? (c) Are the ASME requirements for pressure relief valves on IF-300 series casks the same ones that apply to stationary nuclear power plant components such as pressure relief valves? (d) If answer to c is other than affirmative, please identify which sections of the ASME code apply to pressure relief valves on IF-300 series casks and which apply to pressure relief valves in nuclear plants. (e) Do Applicants agree that pressure relief valves (i) generally (ii) in nuclear plants (iii) in spent fuel casks (iv) in IF-300 spent fuel casks (v) in CP&L's ~~xxxx~~ cask, sometimes stick open? (f) if your answer to or for any part of (e) above is other than affirmative, state in detail the basis for your answer and all facts which support it.

67-1 (a) Has any nuclear utility other than CP&L ever been caught disposing of low level radioactive waste (i) in landfills not approved for radioactive waste disposal (ii) through scrap dealers (iii) without proper authorization? (b) for each part of (a) above for which your answer is affirmative, please identify each such utility. (c) Do Applicants know of any nuclear utility company which is doing any of the things inquired about in (a) above which has not yet been caught? (d) If answer to (c) is affirmative, do Applicants plan to identify such utility to the NRC? (e) If answer to (d) is other than affirmative, why not? (f) what is the identify of each utility for which your answer to (c) above is affirmative?

67-2(a) Did any lawyer for Applicants, or on retainer to Applicants, participate in any way in drafting the "Southeast Interstate Radioactive Waste Management Compact"? (b) did any other employee of Applicants participate in any way in the formation or drafting of this compact? (c) did any CP&L employee have anything to do with the introduction of NC Senate Bill 196 which contains provisions for North Carolina ratifying such compact? (d) did any CP&L employee or attorney on retainer to CP&L or its co-Applicants (i) draft or help draft any part of NC Senate Bill 196? (ii) do anything to help get Senate Bill 196 introduced? (iii) lobby in any way for the passage of Senate Bill 196? (e) If response to any part(s) of (d) above is affirmative, please identify for each such part each person who took part in each activity. (f) What role, if any, did the Governor's Waste Management Board play in the negotiation, drafting, or formation of the "Southeast Interstate Radioactive Waste Management Compact" (hereinafter, SE compact)? (g) What part did CP&L's VP William Graham, a member of the Governor's Waste Management Board in NC, play in the negotiation, drafting, or formation of the SE compact?

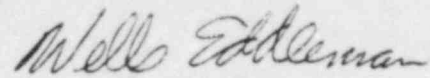
67-3(a) Has the SE compact been ratified yet by North Carolina? (b) If your answer to (a) is affirmative, (i) do Applicants possess a copy of the ratified bill, appropriately certified? (ii) are there any restrictions on the use of the disposal site (aa) at present (bb) in the future for low-level radioactive waste which that bill designates for North Carolina, for any low-level waste from Harris including (cc) resins (dd) filters (ee) trapped radionuclides in any form (ff) radioactive parts, including steam generators or parts thereof removed from Harris (gg) control rods (hh) incore probes (ii) other wastes designated as low-level under NRC regulations?

67-4(a) Has CP&L ever issued any memo or order at its Brunswick plant to attempt to (i) reduce the output of low-level waste from that plant, or (ii) segregate "clean" materials exposed to radioactive material, for disposal other than as radioactive waste? (b) If your answer to either part of (a) is affirmative please identify and date such memo or order (c) Does CP&L presently ship low-level radioactive waste from Brunswick to any site? (d) identify each such site and the amounts shipped (i) in 1979 (ii) in 1980, (iii) in 1981 (iv) in 1982, (v) in 1983, in cubic feet, curies, and number of shipments.

(e) identify all documents containing information inquired about in (d) above.

REQUEST FOR PRODUCTION OF DOCUMENTS

Wells Eddleman requests that Applicants respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described in the answers to each of the above interrogatories, for inspection and copying, at a place mutually convenient to Applicants and Wells Eddleman.



Wells Eddleman

4-22-83