

RELATED CORRESPONDENCE

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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March 19,
1984BEFORE THE ATOMIC SAFETY AND LICENSING BOARDGlenn 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)

Docket 50-400 OL

JOINT INTERVENORS' General Interrogatories and Interrogatories on
to Applicants Carolina Power & Light et al. Contention 7 (VII)
(FIRST Set)

Under 10 CFR 2.740, 2.741 and the Board's 8-18-83 & 3-10-83 + 9-22-82 Memorandum(s)
and Order^(s), Joint Intervenor 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 ^{we} request each answer to be promptly supplemented or amended as
appropriate under 10 CFR 2.740(e), should CP&L, NCEMPA, 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) 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} ~~intend~~ 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 which Applicants rely of the document,
 - (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 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 ⁽¹⁾ 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.

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

documents are the only ones presently known which are responsive to the interrogatories? (iii) If your answer to 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.

G-11 For each answer to each interrogatory herein (or any subpart or part thereof), please identify each item of information in possession of Applicants (including facts, opinions of experts, and documents) which (a) contradicts the answer you made, (i) in whole (ii) in part (please identify each such part for each item of information identified); (b) casts doubt on your answer (i) in whole (ii) in part (please identify each such part for each item of information identified). (c) Please identify all documents not already identified in response to parts (a) and (b) above (and their subparts) which contains any item of information asked for in (a) or (b) above. Please identify for each such document what information item(s) it contains and what answer(s) each such item is related to.

SPECIFIC INTERROGATORIES ON JOINT VII (Joint 7)

7-1 Do Applicants, their employees, consultant(s) or subcontractor(s) or contractor(s) dealing with steam generators have any documents relating to (a) vibration problems in Westinghouse model D-4 steam generators (b) tube cracking in Westinghouse steam generators which have AVT water chemistry and (i) Inconel-600 tubes (ii) carbon steel support plates (c) damage caused by loose metal or other loose objects in steam generators (d) steam generator tube failure analyses?

(e) For each affirmative answer to each of the above parts or subparts, please list all such documents. ^(f) Please also list all documents relating to (i) detection of loose parts in steam generators (ii) detection of loose metal in steam generators (iii) detection of other foreign objects in steam generators, which any of the above possess. (g) If not already stated, please state who possesses each document identified in response to any of the above interrogatories.

7-2 (a) Have Applicants ever used (i) AVT water chemistry (ii) any other water chemistry similar to AVT, in a nuclear power plant?

(b) For each affirmative answer above, please identify the plant or plants, define and/or specify the water chemistry used, identify all documents in your possession specifying such water chemistry and/or its maintenance and/or its effects, and state from what date to what date such water chemistry was used in each such plant for steam generators. ^(c) (i) If you have used any other ~~xx~~ water chemistry than those identified above at a nuclear plant for steam generators, please state (i) why you used it instead of AVT or something-like AVT; (ii) all specifications of this other water chemistry (iii) the identification of all documents in your possession related to this other water chemistry, particularly those related to corrosion, cracking, denting, formation of "crud", "green grunge" or other corrosion products,

7-2 continued

effects of this water chemistry on Inconel-600 alloy, effects of this water chemistry on any other steam generator tube material in use at that nuclear plant, effects of this water chemistry on other metals (e.g. those of tube support plates) used in the steam generators at that plant, and tube failure analyses and/or tube failure experience at plant(s) using this water chemistry. (iv) If you had used AVT or something like it (see (a)(ii) above) at this plant prior to using this water chemistry, please (aa) state all reasons why you changed from AVT or AVT-like water chemistry to this water chemistry (bb) identify all documents related to the change in water chemistry, recommendations for it, any CP&L or CP&L contractor or consultant or subcontractor analysis of the change in water chemistry, or any predictions of the effects on (bb-a) cracking (bb-b) corrosion (bb-c) tube failure, of ^(bb-d) changing to this water chemistry or (bb-e) using this water chemistry. (v) If there is more than one plant for which the answer to any part of (a) above is affirmative, or more than one water chemistry for which any part of (a) above has an affirmative answer, please answer the above subparts (b) thru (c)(iv)(bb-e) separately for each plant and for each water chemistry.

7-3 (a) For each nuclear plant and each water chemistry you identify or specify in response to any part of 7-2 above (or any subpart(s) thereof), please state (i) the predicted rate of tube failure (ii) the predicted (aa) rate (bb) number of cracks formed in tubes (iii) the predicted rate of tube corrosion (iv) the predicted maximum tube wall thinning that was associated with that water chemistry (v) the ^{maximum} predicted rate of tube wall thinning associated with that water chemistry (vi) the predicted average rate of tube wall thinning associated with that water chemistry (vii) whether any synergistic

7-3 continued

corrosion effects ~~xx~~ of any kind were predicted with that water chemistry, and particularly (aa) synergisms associated with the water chemistry (bb) synergisms associated with the metal(s) used in the condensers (cc) synergisms associated with the metals in the other steam piping of that plant (dd) synergisms associated with the metal of the turbine blades of that plant (ee) synergisms associated with the metal of the turbine shaft of that plant (ff) synergisms associated with contaminants in the (ff-a) primary side (ff-b) secondary side of the steam generator. (viii) For any of the above subparts of (vii) ~~whenever synergisms were predicted~~ list all other than synergisms effects ~~predicted~~, or taken into account in deciding to use that water chemistry, which are associated with the matter inquired about in that subpart.

(b) For each item inquired about above, please state (i) all actual observed instances or rates or occurrences of it which CP&L is now aware of, specifying which plant and which water chemistry each relates to (ii) identification of all documents in your ~~xxxx~~ possession relating to the actual occurrence or rate of that item. (PS please recall what John O'Neill has said about synergisms being arguable by us.)
estimates or calculations or

(c) Were any [^]predictions made concerning the amount of radiation exposure to be incurred in (i) inspecting (ii) maintaining (iii) cleaning (iv) repairing (v) replacing steam generators at any CP&L nuclear plant? If so, for each area identified above, for each such plant (e.g. Harris, Robinson 2), please state (aa) the date of the estimate ^{calculation or prediction} (bb) who made it (cc) all qualifications of that person or person(s) to make it (dd) a list of all documents and work papers referenced or involved in making it, or in which that estimate, calculation or prediction is made.

7-3 continued

(d) Does CP&L maintain any records of (i) individual radiation exposure (ii) internal radionuclide exposure (iii) total person-rem's of exposure, involved in (aa) inspecting (bb) maintaining (cc) cleaning (dd) repairing (ee) replacing steam generators at Robinson 2? (iv) for each subpart above for which your answer is affirmative, please list all such records and produce (you may substitute numbers for names and/or identifying information in individual records) copies of the information, stating which of the 3 x 5 (15) subparts above the information relates to.

(e) For each of the items in (d) above (15 items) for which CP&L does not maintain records, (i) does the NRC have records of it for Robinson 2 to your knowledge? (ii) do you keep any information other than records concerning this item? (iii) Please list all documents containing (aa) NRC information (BB) other information you possess, concerning this item.

(f) Do you possess any information on radiation exposure associated with (i) steam generators (ii) S.G. inspection (iii) S.G. maintenance (iv) S.G. cleaning (v) S.G. repairs (vi) S.G. replacement, at other nuclear plants (aa) in the US (bb) outside the US? Please list all documents containing such information that you possess for each of the 2 x 6 (12) things inquired about above.

(g) Do you have any comparisons of radiation exposure associated with CP&L steam generators versus radiation exposure associated with any other nuclear utility's or utilities' or plant's or plants' steam generators, not identified above? If so please identify all documents containing such comparisons and state where the comparisons are in each such document.

7-4 (a) Who invented AVT water chemistry? (b) Is AVT water chemistry ever used in non-nuclear boilers? If so, where, when, or in what types of boilers? (c) Does CP&L use AVT water chemistry in any non-nuclear boilers? Which ones? For how long? (d) Has CP&L ever used AVT water chemistry in a non-nuclear boiler where you don't use it now? If so, why did you change? (e) Please identify all documents not identified in response to interrogatories above, which describe AVT water chemistry, its uses, its problems, and/or its advantages if any. (f) Do you know anything about corrosion rates in non-nuclear boilers using AVT water chemistry? If so, please state what you know and identify all documents concerning such corrosion rates ~~a~~ you possess, and identify also all documents on which you rely in stating what you know about corrosion rates in non-nuclear boilers with AVT water chemistry. (g) please state all differences known to you, including pressures, flow rates, temperatures, metals used, other components used, etc. between non-nuclear boilers of each type stated in response to (b) above, and the Harris steam generators.

7-5(a) Do you have any information or know anything about Westinghouse recommending changing away from AVT water chemistry for PWRs at any time? (b) Please state what you know and identify all documents related to any such recommendation for any PWR or PWRs, ~~in~~ which information or documents is/are in your possession. (c) Do you have any information or know anything about Westinghouse recommending changing from any other water chemistry (or chemistries) to AVT for PWRs at any time? If so, please state each water chemistry from which a switch to AVT was recommended, when it was recommended, and identify all documents concerning each such recommendation for each such water chemistry, and all documents specifying each such water chemistry or predicting its effects or effects that wouldn't or shouldn't happen with it.

7-6(a) Did Westinghouse make any warranty for the ^{original} Robinson 2 steam generators? ~~if xxx~~ (b) Did Westinghouse give any prediction or projection of the useful life of the original Robinson 2 steam generators? (c) Who manufactured the replacement Robinson 2 steam generators? When did CP&L order those replacement steam generators? Why did you order them? Who made the decision to order them? What did they cost? Was that over or under the budget for their cost? (d) did the maker of the Robinson 2 replacement steam generators make any warranty for them? (e) did the maker of the Robinson 2 replacement steam generators give any prediction or projection of their useful life? (f) For each affirmative answer to (a), (b), (d) or (e) above please (i) identify all documents relating to the warranty or projection/prediction of useful life (ii) state the length of the (aa) warranty (bb) projected/predicted useful life (g) Please identify all documents related to CP&L's decision to replace the Robinson 2 steam generators, in particular statements or letters or memos from Robinson 2 plant management to CP&L senior management concerning the steam generators' (i) leaks (ii) deterioration (iii) replacement (iv) repair, including radiation exposure associated with it (v) inspection or cleaning, including radiation exposure associated with either or both (vi) repair (vi) inspection (vii) cleaning (viii) maintenance (ix) radiation exposure associated with maintenance, and also the minutes of any Board of Directors meetings at which steam generators at Robinson 2 were discussed and all documents signed by senior management related to replacement of the Robinson 2 steam generators or the need therefor. (h) Has CP&L or any lawyer or spokesperson for CP&L or any senior official of CP&L ever stated that the Robinson 2 steam generators would not have to be replaced, or should not have to be replaced in the useful life of that plant? ^{please list them all, stating} If so, ^{who} said what, and when? Please identify all documents you possess concerning each such statement.

7-7(a) Where (or from whom) did CP&L get the idea of using AVT water chemistry ~~xxxx~~ for the Harris steam generators (S.G.s)?

(b) When did you get this idea? (c) Please identify all documents relating to CP&L's decision to use AVT water chemistry for the

Harris steam generators. (d) Please state when CP&L first planned to use AVT water chemistry at Harris for the S.G.s (e) Has CP&L

ever had any plans to use a water chemistry other than AVT for the Harris steam generators? If so, please state when, what water chemistry, and all reasons why you planned to use it instead of AVT.

(1) Please identify ⁽¹⁾all documents relating to your plans to use a non-AVT water chemistry (for each such water chemistry you planned to use,

if more than one was planned for) ~~xxxxxxxxxx~~ and also ⁽ⁱⁱ⁾all documents relating to changing your plans to using AVT. (iii) please also identify all documents (aa) specifying (bb) predicting or estimating or calculating or setting forth the effects of (cc) recommending each non-AVT water chemistry you have ever planned to use at Harris.

(e) Did CP&L get the idea to use any of the above-identified non-AVT water chemistries at Harris from anyone? If so, who, and when? Please answer separately for each different water chemistry.

(f) Has CP&L ever done any research concerning AVT water chemistry in steam generators? If so (i) when (ii) who did it (iii) what were the results (iv) who ordered it (v) identify all documents concerning or containing or reviewing this research, which you or your consultant(s), contractor(s) or subcontractor(s) possess.

(g) If CP&L has ever planned to use a non-AVT water chemistry for Harris, who gave you the idea to switch to AVT (or switch back to it)? When? If anyone gave CP&L a recommendation concerning switching to AVT or using AVT at Harris, please identify all documents concerning such recommendation.

7-8 (a) Has CP&L ever received any information or recommendation NOT to use AVT water chemistry in (i) any PWR (ii) Harris?

If so, from whom, and when? Please identify all documents concerning each such recommendation.

(b) Has Westinghouse played any role not described in the above answers, in CP&L's decisions or actions concerning water chemistry at (i) Robinson 2 (ii) Harris? If so, for each, what was that role? Please identify all documents concerning that role.

(c) Are you aware of any differing professional (or other) opinions (i) within CP&L (ii) at Westinghouse (iii) among other subcontractors or consultants you have who work with steam generators, concerning the (aa) use of AVT water chemistry at Harris (bb) the efficacy of AVT water chemistry at Harris in preventing leaks (cc) the efficacy of AVT water chemistry at Harris in preventing tube cracking (dd) the efficacy of AVT water chemistry at Harris in preventing tube wear from being excessive or occurring in more tubes than is acceptable (ee) the efficacy of AVT water chemistry at Harris in preventing tube failure? If any answer to any of the above subparts is affirmative, please state the dissenting or differing opinion, who holds it, and identify all documents you possess related to it or efforts to refute it or action taken or proposed to be taken against the person who holds or held it.

7-9 (a) Does CP&L keep any records of the (i) amount (ii) total amount of corroded material flushed or otherwise removed from the Robinson 2 original steam generators prior to their removal from that plant?

(b) If answer to any part of (a) above is affirmative, please produce a copy of all such records and explain how the amount of corroded material is determined, calculated or recorded. (c) Do you possess any record, estimate or calculation of the amount of corroded material removed in cleaning, flushing, sludge lancing or otherwise from any steam generators using AVT and having (i) Inconel 600 tubes or (ii)

7-9 continued

carbon steel support plates? If so, please identify the plant or plants, the information, estimate or calculation, and identify all documents containing each such record, estimate or calculation.

7-10(a) Do you know if anyone has prepared any estimate of radiation exposure to the public from the Robinson 2 steam generators (originals) being removed from that plant and stored? (b) If so, who has prepared such estimates, when, give each such estimate and identify all documents and workpapers in your possession concerning each such estimate. (c) Exactly how are the original Robinson 2 steam generators to be (i) stored (ii) ultimately disposed of, after they have been removed from Robinson 2? Where will such (i) storage (ii) disposal, take place, if you know. Please identify all documents in your possession related to (i) storage (ii) ultimate disposal of Robinson 2's original steam generators, including any which estimate radiation exposure therefrom to (aa) workers (bb) the public.

(i)
(d) What sort of radiation monitoring (ii) monitoring for leaks of radioactive material (iii) radiation shielding (iv) weather protection is being provided for the Robinson 2 steam generators once they are removed? Please specify all such in detail and identify all documents concerning each of the items (i) thru (iv) inquired about above.

7-11(a) What modifications have been made to the Harris steam generators so far? (b) Please identify all documents concerning the (i) planning (ii) execution (including log books and work records) (iii) results of ~~each~~ each such modification or set of modifications.

(c) Exactly what modifications described in NUREG-09766 (SER for D2/D3 Steam Generator Design Modification, does CP&L plan to make at Harris? Please identify all documents related to each planned modification (d) Exactly what modifications described in NUREG-1014 (SER for Westinghouse D4/D5/E steam generator modification) does

7-11 Continued

CP&L plan to make at Harris? Please identify all documents, plans, blueprints and other information related to your plans for each such modification or set of modifications. (e) What modifications are now in progress on the Harris steam generators? Please identify all documents related to each such modification. (f) Please identify all documents describing or setting forth or giving reasons for the test program proposed for Harris steam generators during startup (preoperational testing, power ascensions, etc). (g) Please identify all changes made to your S.G. startup test program for Harris which relate to S.G. modifications or test the results thereof. You may supply a startup test plan for the S.G.s which you made before the S.G. problems at Ringhals and/or Krsko were discovered, instead of identifying all the changes. Please also identify all documents which plan or describe changes needed or to be made in the Harris preoperational test program as a result of (or related to) steam generator modifications. (h) when were the Harris steam generators delivered to the Harris site? (i) How were the Harris 1 steam generators stored before installation in Harris 1? Please identify all documents relating to such storage or any violation, deficiency, nonconformance, noncompliance or failure to follow procedure or failure to have a procedure for such storage. (j) What is being done with the Harris 2 steam generators? Are they being retained for possible replacement use at Harris 1? have they been sold for scrap? If they are still being stored, please state how, and please identify any documents relating to such storage or violations or noncompliances with any CP&L regulation or procedure or any NRC rule or regulation concerning such storage. (k) Who manufactured the Harris 1 steam generators? The Harris 2 steam generators? When was each manufactured? (l) What heat treatment, if any, was used on the Inconel-600 tubes in the Harris 1 steam generators? Please identify all documents

7-11 continued

concerning the heat treatment of the tube material in the Harris 1 steam generators. (m) What heat treatment, if any, was used on the tubes of the Harris 2 steam generators? Is it the same as for the tube material of the Unit 1 steam generators? Please identify all documents concerning the heat treatment of the Unit 2 steam generator tubes. (n) Do you know if Westinghouse or anyone else is (i) offering (ii) recommending any other heat treating process (besides those used on Harris 1 SG tubes already) for Inconel - 600 steam generator tubes? If so, please describe that process, state who (i) offers it (ii) recommends it, and (iii) identify all documents concerning it, and (iv) state whether that process will be used on Harris 1's SG tubes, and if not, why not, giving all your reasons in detail. (o) Are the Harris 1 steam generator tube support plates made of Carbon steel? Are Harris 2's? (p) Please state exactly what alloy the tube support plates for (i) Harris 1 (ii) Harris 2 steam generators are made of. (q) What samples, if any, of the Inconel-600 used in Harris 1 steam generator tubes, have (i) been retained (ii) been tested in any way? (iii) please identify all documents concerning such samples and/or any test(s) of any of them. (iv) Will CP&L or Westinghouse or the other custodian of such samples make any of them available to Joint Intervenor for testing or inspection? If so, which ones, and for what (testing, inspection, or both) (you should assume destructive testing may be included but you would get back the remains of any samples destructively tested). (r) What ASME or other codes, of what date(s) were used in manufacturing the Harris (i) 1 (ii) 2 steam generators? Do you possess a copy of such codes of that date? If so, please list them. (s) What differences between the ASME or

other codes used to manufacture the Harris SGs, and the current codes applicable to SG manufacture, are there? Do you have a copy of the current codes applicable to SG manufacture? If so, please list all such codes you have a copy of.

(t) What degree, percent, or amount of thinning of S.G. tube walls do you anticipate (i) on average (ii) as a maximum for a typical tube, (iii) as a maximum for any tube, as a result of expansion of the tube(s) in ^(d)the ~~Rx~~ Westinghouse S.G. "fix" described in NUREG-1014 (bb) any other S.G. modification now planned or considered for Harris. Please provide or identify all documents concerning your answer and all workpapers and documents relied on in calculating or ~~xxxxixix~~ arriving at it, for each item above (2 x 3, or 6 items).

(u) What amount of corrosion or expansion of tube support plate material would be necessary to begin denting the Harris SG tubes (i) as they are now (ii) as they are projected to be after being expanded?

(v) Do you have any monitoring data concerning vibration of steam generator tubes at ^v(i) Krsko ^v(ii) VC Summer ^v(iii) McGuire ^v(iv) Ringhals 3 ^v(v) Almaraz (?spelling)? If so, for each plant, identify what data you possess, specifying which of it was recorded after the SGs at such plant were modified. For each plant, also identify which SG modifications have been made and when, if you know. If you know how many tubes have ^(v)(a) failed ^(v)(b) been plugged ^(v)(c) cracked ^(v)(d) been dented (ee) shown indications on eddy current testing, at any of these plants, please state how many have what problem at each plant. Please identify all documents concerning tube rupture, tube failure analysis, or any of the above tube problems at each plant listed in v-(i) thru v-(v) above.

(w) Will there be a loose parts monitor on (i) the hot leg (ii) the cold leg (iii) the secondary side, of ~~xxxx~~ S.G. at Harris 1? If so please identify the monitor, its maker, all documents concerning its

performance (actual or projected), and its location, giving all details of its installation. Please also state, for each monitor, if that monitor (or that type of monitor) has ever been used at (aa) Oconee (bb) Point Beach (cc) Kewaunee (dd) Ginna (ee) Robinson 2 (ff) Krsko (gg) VC Summer (hh) Ringhals 3 (ii) Almaraz. Please identify all documents related to the use of each such monitor in operating nuclear plants (or any operating nuclear plant). Please state for each monitor the model number, its specifications, and any instructions of the manufacturer concerning its installation, maintenance, and/or reliability. Please identify all documents relating to any of the above items in the preceding sentence. For each monitor identified above, please state if it is Class 1 equipment, and if not, all reasons why not. (x) Are there any loose parts monitoring devices now installed

on the Harris SGs or piping leading to or from any of them? If so, please identify each such monitor and give all information about it that is requested in (w) above for monitors to be installed on Harris 1.

(y) Please identify all documents related to performance of loose-parts monitoring devices ~~for~~ which can be used on steam generators or associated piping, which you possess but have not yet identified.

(z) Please identify any other loose-parts monitoring (i) devices (ii) methods which you plan to use at Harris, and all documents related to each. Please answer all questions in (w) above re each such device, and give the location(s) in which you now plan to use the device.

7-12 (a) Have you ever seen or possessed a copy of a report by Science Applications Inc. titled in whole or in part "Value Impact Analysis of Recommendations Concerning Steam Generator Tube Degradation and Rupture Events" or words to the same effect? (b) If answer to (a) is affirmative, are you familiar with the recommendations in that report? How many of them are there? Which, if any of them, do you

7-12 continued

(i) have implemented (ii) plan to implement (iii) plan not to implement at Harris? (c) For each such recommendation, please give all reasons why you (i) have implemented (ii) plan to implement or (iii) do not plan to implement it. (d) Please identify all documents concerning your decision(s) to implement or not implement each such recommendation of the "SAI report" referred to above.

7-13 (a) What instrumentation have you installed in the Harris 1 SGs to detect vibration in (i) the preheater (ii) the tubes (iii) other parts of the steam generator? Please identify all documents describing such instrumentation, its preferred or proper conditions for operation, its durability under conditions where it is or will be installed, the manufacturer's specification of it, its design, its applicability to such monitoring, of its reliability under conditions where it is used or planned to be used. (b) What other nuclear plants have (i) the identical (ii) similar instruments installed for (iii) the same (iv) similar purposes, as those you identified in response to (a) above, to your knowledge? For each, please state the similarities and differences in the instrument(s) and the purposes for which each is used, to the extent you know them. (c) what other nuclear plants use loose parts monitors of the types or models identified in response to 7-11(w), (x), or (z) above, to the extent you have not already identified all such plants? Please state what monitor (model or type or both) each such plant uses, for what purpose.

7-14(a) Please identify all studies of corrosion in steam generators not identified in response to above interrogatories, concerning

(i) Inconel-600 tubes and AVT water chemistry (ii) SGs with AVT water chemistry (iii) PWRs with aluminum bronze parts in their condensers (iv) PWRs with alloys containing copper in their condensers

(v) at Krsko (vi) at V C Summer (vii) at McGuire (viii) At any other PWR with Westinghouse steam generators (ix) at any PWR with Westinghouse D4 steam generators (x) at any PWR with Westinghouse D5 steam generators (xi) which involve analysis or estimates of tube failure (probability, number, time, etc) (xii) which involve analysis of estimates of tube cracking (xiii) which involve estimates or analysis of how many tubes will have to be plugged (xiv) which involve estimates which have proved to be correct (aa) 5 years later (bb) more than 5 years later, concerning corrosion, tube wall thickness, tube rupture, tube cracking, number of tubes that have had to be plugged, etc. (xv) which deal with thinning of tube walls after expansion of tubes (xvi) which deal with corrosion of SG tubes during extended shutdowns (xvii) which deal with heat

treatment of Inconel-600.

7-16- What documents does CP&L possess related to the W Owners Group Steam Generator Tube Rupture Subgroup? When do you do you plan to provide the NRC requested 3-8-84 on operating response time?

7-15(a) Is the tube metal in the Harris SGs Inconel-600? If not, please identify the tube metal, and answer the above interrogatories substituting the correct identify of the SG tube metal wherever the words "Inconel 600" occur. (b) Will CP&L commit itself unconditionally to never use a water chemistry other than AVT at Harris? If Please give in detail all reasons for your answer, and identify all documents and work papers you used or relied upon in answering and all expert opinion(s) you relied on in making your answer. (c) please identify all water chemistries other than AVT which you may consider for use at Harris and identify all documents describing each and/or its advantages, disadvantages and/or effects or claimed lack of effects. (d) For each water chemistry identified in response to (c) above, please state all circumstances under which CP&L would (i) consider using (ii) use, it at Harris 1.

PRODUCTION OF DOCUMENTS

Joint Intervenor hereby request CP&L to produce the original or most legible copy of each document identified in response to any of the above interrogatories for inspection and copying at a mutually agreeable time and place.

For Joint Intervenor Mark Edelman