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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the ATOMIC SAFETY AND LICENSING BOARD

In the matter of	)	Dockets Nos.
CAROLINA POWER AND LIGHT COMPANY, ET.AL.	)	50-400 and
	)	50-401 O.L.
Shearon Harris Nuclear Power Plant, Units 1 and ?2	)	
	)	May 14, 1982

SUPPLEMENT TO PETITION TO INTERVENE
by Wells Eddleman, pro se

Under 10 Code of Federal Regulations ("CFR") Section 2.714 (a)(3)(b) and the Order of this Board (Glenn O. Bright, Dr. James H. Carpenter, and James L. Kelley, Chairman) dated April 2, 1982, I, Wells Eddleman, (presently at 325 E. Trinity Avenue, Durham, NC 27701; on May 17, 1982 my address will be 718-A Iredell Street, Durham NC 27705 for service of all motions, orders and other documents in this proceeding -- parties please take note; my new home is almost exactly the same distance from the Harris nuclear plant site as is 325 E. Trinity, on which my lease is expiring, and the move changes none of the other matters in my original petition to intervene) hereby:

(1) file this supplement to my petition to intervene listing contentions which I seek to litigate in this matter, and the bases therefor (including the definitions and incorporation by reference as set forth below), fully reserving the right to amend or expand this filing of contentions on the basis of information not now known or available to me, such as that contained in documents that

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were not in the Local Public Document Room (either at Wake County Library or Chapel Hill Public Library), which I have requested from the LPDR Branch of the NRC on or before May 14, 1982 and which were not delivered to either or both named LPDRs and available there to the public, myself included, on or before May 14, 1982, and

such as is contained in any amendments to the Applicants' Application, Final Safety Analysis Report (FSAR), Environmental Report (ER), Applicants' files and correspondence, and/or in the NRC Staff's Safety Evaluation Report or Environmental Statement (SER or ES) or the Advisory Committee on Reactor Safeguards' (ACRS') review of theHarris plant, which have yet to be filed in this proceeding or which were not available to me at home, in person, or at one or both of the above LPDR's on or before the close of business on May 14, 1982; or for any other good cause as I may hereafter demonstrate under the Board's orders or 10 CFR Section 2.714(a)(1).

In support of the above, I hereby address the 5 factors enumerated in 10 CFR 2.714(a)(1) with respect to the above matters insofar as it is presently possible to do so:

(i) It is clearly good cause for failure to file "on time" (i.e. by May 14, 1982 per the Board's April 2, 1982 Order) that the information on which a filing is based did not exist at that time or was not available to me at or before that time. How can I predict accurately and specifically enought to satisfy the requirements of 10 CFR 2.714(a)(3)(b), what information is in documents I have never seen, never had available, and/or which

have not been written and do not even exist as of the May 14, 1982 "on time" deadline for contentions to be filed in this case? Clearly I cannot be expected to do the impossible, such as the preceding sentence would require me to do, so I have shown good cause for later filings.

(ii) There are no other means whereby my interests can be protected with respect to matters and facts described above not existing or not known and not available to me by the May 14, 1982 deadline. The Board on its on motion, or the Commission itself, might <u>choose</u> to order that such matters be considered, but I have no control over that, If they do not do so voluntarily, or rule the matter(s) and amended and/or additional contentions admissible, I have no recourse. Certainly, if I am not permitted to file additional and/or amended contentions on matters as described in sections (1) and (i) above, there is no means whatsoever for me to protect my own insterests.

(iii) since admissible contentions must be matters affecting Applicants' ability to operate their Harris nuclear plants without harm to the public health and safety, or matters affecting the cost-benefit balance of the project under NEPA, 10 CFR 51.21, and the <u>Calvert Cliffs</u> case (cited with relevance explained below), any admissible contention filed late for the reasons cited above must be of use in developing a sound record by fully exploring the known issues on the basis of known information as of the time of the hearing, and not on the basis of information as of May 14, 1982 and issues identified only from that part of the information existing at May 14, 1982 that was actually available to me on or before that date.

Omitting issues and contentions that directly address the requirements on NRC and this Board under the Atomic Energy Act and the National Environmental Policy Act and applicable court decisions will lead to an unsound record, not a sound one. Therefore additional contentions based on the matters cited above (or for other good cause under 10 CFR 2.714(a)(1)) should be admitted, provided they meet the requirements of 10 CFR 2.714 (a)(3)(b), in the interest of developing a sound record.

(iv) If the Board treats all Parties fairly, as I fully expect it will and must under the law, my interest in having contentions based on the matters cited above in (1) and (i) on info not existing, or unavailable to me as of May 14, 1982 cannot be any better represented by any other party. This is because fairness requires that if I can't raise contentions after May 14, 1982 based on these matters, neither can any other party. (And if I can, they must also be allowed to.)

Moreover, there is no guarantee that the other parties will exist at some future date, or will have continued to be parties to this proceeding, when additional information becomes available on which I might file additional or amended contentions in this proceeding. If other parties do exist, and do have the right to file contentions based on such information while I do not have any such right, there is likewise no guarantee that any of them will file and pursue such contentions as will protect my interests under the Atomic Energy Act and the public interest and my interests under the National Environmental Policy Act. The remedy for all this uncertainty is to grant all parties the right to file additional and amended contentions (as I have requested above) and for the Board to then

consider the admissibility of said contentions under 10 CFR 2.714(a)(3)(b).

(v) Of course, raising a newly discovered issue or contention (or amending a contention based on new information) broadens the issues. But the extent to which an amendment to a contention broadens the issues is de minimis (trivial, very very small) in the context of a proceeding as extensive and complex as licensing two large nuclear power stations to operate. Consider the 20 thick volumes of the Applicants' FSAR, the 3 thick volumes of their ER, and the volume of additional documents which may yet be filed in this proceeding (comparable to the volume of additional amendments and documents filed in other nuclear operating license cases after the initial contentions have been filed). Compared to this enormous volume of information and issues which the Board must consider even in the absence of any Intervenors or Petitioners at all, even a large number of entirely new contentions, based on information not previously available to Petitioner(s)/Intervenor(s) and otherwise admissible under 10 C.F.R 2.714(a)(3)(b), is not significant, much less amended contentions.

Moreover, one purpose of amending contentions is to make them more specific, which can serve to expedite the hearing. And if a new or amended contention can be brought to hearing earlier than scheduled and end the proceeding if resolved (see request for expedited hearing on certain groupings of contentions, below), it can actually speed up the hearing process.

Finally, in a proceeding not even set to have a hearing for two years or more from the present, the extent to which any new contentions or amended contentions filed more than approximately 5 months before the hearing date (30 days for filing, answer and response plus 30 more for the Board to rule on admissibility under 10 C.F.R 2.714(a)(3)(b) if it needs that long to rule, plus 30 more to file discovery, 30 more to answer (at most; should be expedited late in the process toward hearing) and 30 more for Petitioner/Intervenor to prepare evidence) should have no effect whatever on delaying the proceedings.

Even closer to the hearing date, a balancing of the 5 required factors cited from 10 CFR 2.714(a)(1) indicates that delay caused by one or more additional or amended contentions will be de minimis in comparison to the extensive issues raised in this proceeding and the importance of protecting the public health and safety under the Atomic Energy Act and public and private interests under NEPA. To be admissible at all, a contention must be specific enough and relevant enough to the issues in this case to assist in developing a sound record by being heard. There are no other means, other than raising such issues when the new information becomes available (I would request 45 days thereafter, to preclude Applicants flooding me with more material than I can possibly read and evaluate in less time and file contentions or amended contentions based thereon), whereby my interests can be protected, including the other parties acting in my interest, which they cannot be guaranteed

to do.

Since a new contention or amended one could be heard later in an ongoing hearing, more time would be available to deal with it. For a sufficiently important new issue or new aspect of any contention, a later hearing might be set just dealing with that issue(s) in the Board's discretion.

Therefore, having shown under 10 CFR 2.714(a)(1) why I should be allowed to file additional and amended contentions after May 14, 1982 based on information as set out under (1) above, I request the Board to order that any new or amended contentions filed by me as set out under (1) above be ruled on pursuant to 10 C.F.R. 2.714(a)(3)(b) at dates to be established by the Board, but in no event earlier than 45 days after the information becomes available to me; that I be allowed those same 45 days in which to file such new or amended contentions pursuant to (1) above; and for such other relief as the Board shall consider fair, just and necessary to the preceding and/or to other petitioners and/or to other parties.

In making the above statements about 10 CFR 2.714(a)(1) I in nox way imply or state that the Board has to consider the 5 factors listed therein in order to allow amendments or expansion of contentions after 14 May 1982 in this case. The requirement of 10 CFR 2.714(b) (or (a) (3) (b) as it is listed in the LPDR copy and cited above) is for "reasonable specificity" in contentions accepted.

It is self-evidently unreasonable to require exact citations or detailed specifics about documents that do not yet exist but are required by NRC rules to be filed in this case, such as the SER, Environmental Statement, ACRS O.L. report, further responses to the TMI Action Plan, plans for fire protection, environmental qualification of electrical equipment, Harris plant and site security, emergency response plans, evacuation plans, technical specifications not yet listed, new rules the NRC may adopt or change, or responses to future nuclear accidents that haven't yet happened, letters and memoranda Applicants haven't yet written, etc. In such cases, "reasonably specific" must mean as reasonably specific as one can be expected to get, and for documents that do not yet exist, any contentions now filed are reasonably specific if they say in what areas of ways the documents and filings yet to be produced may be or are expected to be deficient or otherwise in error, defective, wrong, and so on.

Indeed, even if by a miracle a petitioner such as myself could accurately and with great specificity predict deficiencies, errors and so on in these future documents (e.g. "I contend that when the SER is filed it will use 2604 psig as the maximum primary system pressure to be expected in an ATWS, whereas the correct figure is 6298 psi as described by Dr. Smith in NUREG-1984, published August, 1983 at pages 442-2130") such highly specific predictions would be of no use except to tell the report writers what mistakes to avoid. There would be no way to assure that all serious, material problems in the future

could be so identified as deficiencies.

And a highly specific contention about a document not yet existing provides an easy escape without addressing the issue: simply change the document, as it is being written, so that there is some ground, however narrow, to argue that the highly specific predictive contention does not apply. While a responsible and safety-minded official of Applicants or NRC Staff or ACRS or other body preparing such a report might well address the specific predictive contention and correct any errors, non-conservatisms, and deficiencies the contention identifies, no one can be sure that this will be done or that all such problems will have thereby been found and corrected.

Moreover, there is heavy nuclear industry and Congressional pressure on NRC Staff to license nuclear plants rapidly, and pressure on Applicants to justify the Harris project even though Applicant CP&L's chairman Sherwood Smith (e.g. the ~~inter~~ facts of all 4 NC &SC senators to get McGuire Nuclear Station licensed in 1981) admits (Raleigh News and Observer, 9 May 1982, pages 1D and 7D) that if CP&L was starting the Harris project today it would not be built as a nuclear plant, is likewise intense in view of the $1.4 billion CP&L claims (ibid.) to have sunk into the project. Thus there is reason to believe that, under this sort of pressure to simply get the license done, NRC Staff and Applicants might use highly specific contentions of a predictive nature as guides to how to avoid the issues those contentions raise in this proceeding, without taking the time and effort to properly analysze the issues involved and protect the public health and safety and comply with NEPA, 10 CFR 51.21, and Calvert Cliffs (cited below).

In spite of these sensible arguments, I feel compelled to file a good number of contentions based on the yet-to-be-filed documents such as the SER, ES, amendments to FSAR and ER, etc, because the Board might not allow any more contentions to be filed after 14 May 1982, or might make it impractical for me to do so by imposing excessive requirements at the behest of Applicants and/or NRC Staff, which might be acting under the pressure to simply get a license done, as mentioned above. Thus, while I have made good faith efforts to be reasonably specific, I have not attempted to predict exactly the content or to describe in great detail the problems I anticipate, but only to provide that degree of specificity that is reasonable in the light of the information available to me (including at the LPDRs) on or before 14 May 1982 which is the deadline for filing contentions in this case. I cannot be expected to do more now, but will certainly clarify and amend contentions to the best of my ability when the necessary information to do so, either new documents, discovery information, or other information, becomes available to me, and all I have requested is adequate time to review this information and file new, amended or more specific contentions. I have tried to explain how and why Applicants' plans, designs, staff, analysis, filings, construction, etc. in this proceeding are in error, deficient, etc. under the Atomic Energy Act, NEPA, etc (see "Definitions" below), and to cite examples of how certain events could happen and what kinds of problems, deficiencies, errors and so on exist, without saying in any case that I have specified each and every such problem, deficiency and error that is within the scope of my contention or contentions written herein.

I have also endeavored to frame contentions so that they do not attack the rapidly changing NRC rules, though in some instances it appears to me that the rules are so arbitrary and capricious (e.g. discussion in contentions on cancellation of Harris 2, need for power, financial qualification of Applicants) that they deserve attack and I want to lay a basis here for doing so through the Courts. Even in these instances, I have carefully framed contentions or sub-contentions that have nothing to do with the existing or recently revised rules, so that these should be admissible by themselves, or after deleting certain parts of the contention.

I thus believe I have satisfied the requirement of reasonable specificity under 10 CFR 2.714(b) (or (a)(3)(b), and my contentions should be allowed unless they are shown to be unreasonably unspecific in light of information actually available to me (including actually being in the LPDR files at Raleigh or Chapel Hill) at or before 14 May 1982, and in the light of how detailed one can be expected to make a contention in terms of space and time limitations. For this latter purpose I have incorporated by reference many contentions into others so that I won't have to repeat definitions, explanations of how certain accidents, deficiencies and errors can happen, examples to specify the sort of thing I am talking about, etc, but can simply refer to those in other contentions where these matters are fully set out. I ask the Board to accept these references for the purpose of showing examples, definitions. specific ways things such as accident potential, deficiencies, errors, lack of good faith,special needs, specific needs, harm to the public's health, safety and property, violation of AEA or NEPA,

incomplete or insufficient information, incomplete or insufficient analysis or plans or data, lack of up-to-date information, lack of use of relevant experience and tests, and so on apply. By using incorporation by reference I hope to make this set of contentions much shorter, and sufficiently and reasonably specific, using the incorporations as if fully set out where they are noted.

I believe these contentions set out below are reasonably specific enough to put Applicants and staff on notice at least generally of the matters I intend to have litigated herein, especially since all these contentions are subject to refinement and revision at the time of the final pre-hearing conference in this case, which may be 2 or more years away.

I ask the Board to take judicial notice of ALAB-664 (TVA, Brown's Ferry Nuclear Plant) which allows the Board discretion to defer rulings on any contention where the document or information needed in order to assess a contention has not yet been produced or made available to Petitioner/Intervenor. My position is that this discretion applies to information to be obtained on discovery also, and that discovery for the purpose of rendering contentions more specific or adequately specific in the light of additional information obtained thereby (reasonably specific in the light of information actually available to petitioner/intervenor) be allowed to me in this case on all contentions.

I also ask the Board to take judicial notice of NEPA section 102 and of section 189(a) of the Atomic Energy Act, providing specifically that environmental questions be open

"to the fullest extent possible" throughout the NRC's review process (which obviously includes this case and the hearing on the operating license for Harris 1 and 2). And the AEA provides that if contentions are filed prior to discovery, there is a right to hearing on an operating license. (BPI v. AEC, 502 F2d 424, 1974) Obviously this right includes the right to discovery about the contentions (else why have the contentions filed before discovery); and the NRC's own rules and practice allowing refinement and revision of contentions at the final pre-hearing conference clearly contemplates that contentions may be revised or refined before then, but after filing (e.g. after discovery concerning them). Since the contentions as filed and the discovery request reasonably inform Applicants and NRC Staff of the matters at issue, they cannot argue that the requirements set in Philadelphia Electric Co, 8 AEC 13 (1974) are violated provided petitioner has at least one contention that is reasonably specific in view of the situation at the time that contention is filed, and that petitioner seeks appropriate discovery to make any such contention more specific (thereby putting them on more detailed notice of what is at issue and what petitioner seeks to litigate) and makes said contention more specific within a reasonable time based on adequate information obtained through discovery. A need to establish greater specificity in a contention which can only be met through information not available to petitioner/intervenor prior to the contention filing deadline is not "lateness" within the meaning of 10 CFR 2.714(a)(1) since the lack of that information is outside the contention-filer's control. And in my case I have made considerable efforts to get more information

made available to me, which is another point in my favor on this matter, in that I didn't just let the information be unavailable, but have tried to get it.

Statement of general applicability incorporated by reference into each and every contention filed herein (including any to be filed later in this proceeding)

A. If the Board considers any of this contention, or any part thereof, as an attack on any rule or regulation of the Commission (NRC) or any provision thereof, or as a collateral attack upon a pending rulemaking, petitioner respectfully requests the Board to:

(1) exclude only those parts of contentions that in those parts specifically attack any such rule, regulation, provision, or pending rulemaking, letting any other parts of the contention stand independently;

(2) specifically identify the rule(s), regulation(s), provision(s) or rulemaking(s) judged to be attacked, and explain how and why, in the Board's view, such contention or part of any contention attacks each such thing specifically identified by the Board;

(3) that petitioner be permitted to seek an exception to or a waiver of the application to this proceeding of such item specifically identified by the Board under (2) above, particularly with respect to rules and regulations not in effect as of 26 February, 1982 when petitions to intevene in this proceeding were due to be filed, and as to any other matters considered impermissible attacks by the Board under (2) above.

(4) that the Board certify for appeal to the ASLAB and/or

the full Nuclear Regulatory Commission, as appropriate, an appeal as to any contention entirely rejected by the Board under (2) above, and all such contentions, in an expedited manner so as to avoid prolonging this proceeding and so as to avoid the possibility of remanded hearings later, if requested by this Petitioner/Intervenor to do so.

B. Although some of the contentions set forth herein are sufficient in themselves, to deny the Operating License Applicants seek herein (e.g. the contention that the costs of the project exceed the benefits; and the contention that the cost-benefit difference becomes an even greater excess of costs over benefits if only Units 1 and 2 are completed; and the contention that the excess of costs over benefits is still greater if only Unit 1 is built; the last 2 also contending that the excess of costs over benefits will be greater if the project is completed and operated than if it is abandoned now), in my view,it is all of the contentions taken together that constitute my overall reason why the license sought in this case should not issue. Therefore, each contention stands here as a partial reason why the operating license should not issue, and should be accepted if proving such contention or part of it would weigh against issuance of an operating license for Harris units 1 and 2.

C. Petitioner wants and hereby requests an expedited hearing on certain contentions (numbers 14 thru 18, 20ABC+E, 21 thru 23 and 129 including those mentioned in B above) because if proven, they would finish the case by themselves. But in the event such expedited hearing is not granted, the contentions men-

tioned in this part shall stand for hearing later (as admitted, if they are). I believe the Board should grant expedited hearing on each and all of these contentions named in this part C, since they fall under the requirement of Section 102 of NEPA that environmental questions shall be open to consideration to the "fullest extent possible" throughout the review process of any federal agency (such as NRC). Since if proved, these contentions together or separately will show that the Harris project should be abandoned as a way of cutting the losses since its costs will exceed its benefits, it is necessary to consider them now, at the earliest practical time for a hearing. (I suggest October, 1982, to allow time for discovery and preparation of my case and to allow NRC staff, other parties and Applicants time to prepare also.) Waiting to hold these hearings on these issues will simply result in more money being spent on the Harris project, which will be an increase in the losses that must be borne since the net excess of costs over benefits for the complete Harris project is greater than the $1.4 billion already spent on it. Neither this Board nor Applicants nor NRC is authorized under NEPA to impose such a monetary loss on the public or anyone on a project where federal permits are required to continue the project. Therefore I hereby move that the Board suspend construction on the Harris project, effective as soon as you can issue an order, pending an expedited hearing on the above mentioned contentions in this part, or in the alternative to set oral argument on this motion to suspend construction for the special pre-hearing conference now set for June 14-15, 1982. The reasons for this motion, including those set out in the

contentions listed above, are basically that by CP&L's numbers, as filed herein in their ER of December 1981, the net loss on the Harris 1 and 2 project is nearly $2 billion; that if errors and omissions listed in the contentions referenced in this part are corrected, the net loss will be even greater; that if CP&L for whatever reason does not build or complete and operate Harris Unit 2, as seems likely or at least possible in the wake of the December 1981 cancellation of Harris 3 and 4, the losses net will be greater still if Harris 1 alone is completed and operated; and that the expenditure of $1.4 billion to date on the Harris project, together with penalties for cancelling construction, is less than the most credible of these loss figures, and very likely less than the $2 billion excess of costs over benefits computed by using CP&L's own figures as filed with NRC. Therefore the only way to choose the alternative that maximizes cost-benefit as required by NEPA is to minimize the loss, since there will be no net benefits. The loss is minimized by stopping construction now (or in the alternative at the earliest possible date).

Further and separately to be considered as another motion, the above reasons are why expedited hearing on the contentions named herein in part C should be granted by the Board, in order to comply with NEPA to the extent that is possible, by minimizing the loss.

Petitioner further argues + contends that CP&L is estopped from pleading on this matter that the data supplied by CP&L in the ER is incorrect, since CP&L filed it December 1981 (timely), has filed no updates on it, and 10 CFR 51.21 requires all new and

changed information available be filed in the Operating License Stage Environmental Report. Thus, if the data is incorrect, CP&L's Application herein should be dismissed for lack of compliance with NRC rules (co-Applicants should also be dismissed for failing to exercise their responsibility under 10 CFR 51.21 to file accurate and up-to-date information in their Application Environmental Report at the O.L. stage). CP&L knew when Harris 3 and 4 were going to be cancelled, and undoubtedly did studies of how this action by CP&L would affect the costs and benefits of the Harris project. Not filing such information is a breach of good faith as well as the NRC rules cited above, if CP&L had the information or any such information. Therefore, if CP&L contends the present application is properly before the Board under the NRC rules, CP&L will have to stand or fall on the numbers they filed in the application and its associated ER, or give a good and sufficient explanation of why they have waited at least 6 months to file information most relevant to this proceeding under NEPA, or withdraw the Application and re-file.

(D) With respect to any matter or part of any contention that the Board does not believe it has jursidcition over, petitioner respectfully requests that the Board:

(1) excluded from consideration in this case only such part or parts of contentions as in themselves clearly go beyond the Board's jurisdiction;

(2) for each such excluded contention or part thereof state specifically the exact legal basis for the exclusion;

(3) for any and each such matter excluded, including antitrust questions, state whether any other part of NRC

including the Atomic Safety & Licensing Appeal Board or the Commission itself or the Director of NRR or any other part, division, section, directorate, person, subgroup, branch, etc. within NRC has jurisdiction over the matter excluded;

and (4) to certify for appeal to the ASLAB or NRC as appropriate any such exclusion that petitioner requests an exception from for the purpose of conducting a full and fair hearing in this case, developing a sound record, or for other good cause.

(E) With respect to each contention involving NEPA, petitioner asserts that the changes involved since the Construction Permit (CP) EIS in the area of the contention are new + changed, generally self-evidently so, within 10 CFR 51.21 as revised in March 1982, except as noted above (p. 11)

(1) If the Board decides any of these issues fall under NRC's 3/26/82 Final Rule (47 CFR 12940-12943) I claim that special circumstances, including the magnitude of the changes since the 1973 FEIS and 177 C.P. Hearing, the fact that the cost-benefit balance may go against the Harris plant, particularly as a 2 unit or 1 unit plant, to the extent of >$2 billion, and other impacts specific to SHNPP make it appropriate to consider these contentions under 10 CFR 2.758

(F) With respect to this contention, each and every contention set forth herein, and all other matters before the Board, I assert that under 10 CFR 2.104(c), (d) and (e) the burden of proof as to each and every matter before the Board is entirely on the Applicants, not on me, the NRC Staff, the Board or any other party. (10 CFR 2.732, 10 CFR App 2 IV (d)(1)

(G) With respect to anti trust matters, I hereby request a hearing under 10 CFR 2.104 (d) and assert that under (d)(2) ibid and Section 105a of the Act (AEA) the continued construction of SHNPP and/or its operation, while Power Agency members are under their existing take-or-pay contracts with CP&L (which contain numerous other anticompetitive provisions) [contracts filed in NCUC Dockets E-44 and E-2 Sub 436, Oct 1981] restrains trade, prevents competition, creates and maintains a situation inconsistent with the antitrust laws (sec 105a of AEA + others), and acts to prevent or reduce the likelihood that Power Agency members will implement energy conservation + energy-efficiency-increasing and energy-use avoiding measures, particularly due to the take-or-pay and rate-setting provisions of those contracts referenced above.

(H) With respect to each omission, use of erroneous data, withholding of information, error, or failure or deficiency alleged in this or any contention herein, I request the right of discovery not only to supply accurate, complete and up to date information on the point(s) covered in ~~this~~ the contention, but also discovery as to the reason(s) if any for the omission, error, withholding of information or failure or deficiency, including access to the files of Applicants and NRC Staff.

(I) I have in many contentions made a long list of specific problems in order to meet the reasonable specificity requirements of 2.714(b) of NRC's rules. But should the Board believe that any such list, item, or part of any such listing is too specific (or is overly broad), I hereby request the opportunity to amend said contention to remedy the over-specificity, over-broadness or other defect arising from the listing of specifics which is identified by the Board. Because many contentions in past cases have been rejected by Boards for lack of specificity, I am trying to be specific in some detail herein. But it is not my intent to cause problems by being too specific or detailed, but simply to give examples of how the contentions apply, to what they apply, how certain things alleged or stated in contentions can happen, what may result, and that these relate to NEPA or AEA considerations under those acts, 10 CFR 2, 10 CFR 50.34, 10 CFR 51.21, 10 CFR 50 and its appendices and the matters covered therein, and other applicable rules of NRC and other applicable law, e.g. Sherman Act, court decisions such as Calvert Cliffs, etc.

DEFINITIONS

As used in this entire supplement, the following words and phrases, in addition to their plain meaning, also include the following meanings in full, wherever such meaning is applicable:

See also ADDENDA

"accident" or "nuclear accident" or "release (ing) radioactive material" includes the meaning:"the event(s) listed or a similar event or combination of events which will, or which will have the potential to, release radioactive material from the Harris nuclear plant site and harm the health and safety of the public, including releases from the event(s) described which reach the atmosphere or local water or ground water through containment penetrations, valves, vents, piping, gas processing systems, ducts, broken walls or roofing which are open due to earthquakes, fires, human error, bypassing of safety or control systems for maintenance or tests, failure of isolation systems to function properly, tornadoes, acts of sabotage or terrorism, failure of control wiring or power wiring or electrical or mechanical or air-controlled systems, motors and equipment necessary to isolate the radioactive material from the outside air (or from water or ground water), collapse of filters, (due e.g. to overpressure, pressure surges, collapse of frames holding the filters due to any of the above causes), failure of blowers or air-handling equipment due to any of the above causes, or any other failure not explicitly analyzed in documents actually available in the LPDR for the Harris plant on or before May 14, 1982 and after January 27, 1982, as may be specified in more detail in future amendments, refinements and revisions to these contentions. And, where applicable, the meaning "release of radioactive material from spent fuel transport casks or other transport containers, due to accident, sabotage, terrorism, earthquake while the container is on a bridge or overpass or under a structure which, by falling, can rupture it or prevent its cooling system from working."

"Harris plant", "SHNPP", "Harris", "nuclear plant", "plant", "Plant site" "Harris units 1 and/or 2" refer to the Shearon Harris Nuclear Power Plant, units 1 and 2 and associated buildings and equipment including the fuel handling, auxiliary, materials storage and other buildings on the 10,000+ acre site of said nuclear plant, the cooling towers and associated piping, boilers, generators, transformers, electrical wiring, instruments, controls, computers, electrical equipment, insulation, seals, filters, radioactive waste processing systems, cranes, hoists, reactors, steam generators, pressurizers, valves and all other items of the plant either as built or as described in the FSAR or SER or ER or ES or other document where appropriate, which plant is up for operating licensing in this case.

"special needs" and "specific needs" with respect to emergency planning, radiation protection, and radioactive releases and their health effects (including death and disease) includes the meanings: "any particular needs for additional protection against radiation, special evacuation procedures, additional protection against radiation if the person(s) cannot be moved in the event of radiological releases from the plant, which result from: unusual sensitivity to radiation, as for the fetus, young children (under age 18), older persons, or resulting from medical conditions including respiratory diseases (e.g. tuberculosis, asthma, influenza), liver malfunctions, allergies, genetic defects or congenital defects, e.g. enzyme deficiencies, recovery from surgery, or weakened condition; or spina bifida, Downs syndrome + mental retardation NE which involve the ability to move such persons safely in the event evacuation is necessary, including patients at hospitals, mental hospitals, and nursing homes who are unable to care for and move themselves, or who require life support or medical treatment

when being moved, or who are prisoners or otherwise confined so that they cannot evacuate on their own initiative, and who are in the custody of legal authorities; or who because of handicap or disability (e.g. persons in wheelchairs due to paraplegia, quadriplegia, paralysis, broken hip(s), arthritis, or other causes) are unable to move themselves; persons whose homes or places they are in (e.g. schools, work places, hospitals, nursing homes) cannot be adequately sealed against infiltration of radioactive gases or particles or both in the path or a radiological release plume from the plant, in order to protect their health and safety from genetic damage, thyroid damage, radiation sickness, death or other injury caused by ionizing radiation or by ingestion of radioactive material through breathing, eating food exposed to the radiological release materials (or grown in soil so exposed), drinking water that includes such radioactive materials, through open cuts on their skin or other epithelial tissue); or who cannot be evacuated due to traffic bottlenecks from the design of streets (e.g. near Dix Hospital in Raleigh, throughout the municipality of Cary, near Memorial Hospital in Chapel Hill, and Duke Hospital and VA Hospital in Durham, all of which are on narrow roads that will be carrying heavy traffic in an evacuation in addition to persons being evacuated from the above-mentioned institutions and from homes nearby (which persons have special needs as defined herein); and which needs are not adequately provided for in the event of a maximum accident pursuant to NRC rules for defining the EPZ, LPZ, exclusion area, or other appropriate designation of areas with respect to radiological consequences

of plant accidents, in the emergency response plans as developed, documented and tested per 10 CFR 50.47 and Appendix E theretox, by State, FEMA, Applicants and/or other appropriate emergency planning agencies as provided for in NRC rules, as they now exist, or as they exist at the time this contention is heard in a hearing before the Board."

"deficient", "deficiency","failure", "insufficient", "inaccurate" "fail(s) (ing) to take into account", "error","lack of up-to-date(information) (data) or (tests)" Includes the meanings: "Having or being insufficient to protect the health and safety of the public, or to accurately weigh costs and benefits under NEPA or 10 CFR 51.21 or 10 CFR 50.34 or 10 CFR 2.104 or other applicable regulations, whether due to lack of information, lack of up-do-date and accurate information, lack of testing, lack of use of operational experience at other nuclear facilities as a test or source of information relevant, errors in calculation or analysis or modeling or typing, use of wrong or inapplicable or outdated data or assumptions, failure to provide means to protect the health and safety of the public against the events described (including modifications to plant, equipment, technical specifications, operating procedures, the operating license, the construction permit, or other applicable documents and/or systems and equipment and structures and piping, valves, controls, control logic, computer programs, seals, shock-absorbing systems, impact-absorbing devices, heat removal devices, nuclear reaction controlling devices and systems including primary coolant and boration, security plan(s) and practices, power supplies, redundant safety systems, safety-related equipment, and equipment whose proper functioning is necessary for the functioning of safety

related equipment, devices and systems for radiation protection inside and outside the plant, general and personal, including gas masks, filters, protective clothing, gas processing systems, filters and equipment, radiation monitoring devices, liquid rad waste processing systems, filters, polishers, ion-exchange resins, chemicals, precipitators, emergency response plans, equipment to be used to transport emergency response personnel or to transport evacuees, medical and other equipment including that listed above related to special or specific needs of evacuees, communications equipment used in controlling the plant, its radiation emissions, or in directing and informing emergency response personnel, adequate numbers of qualified personnel for plant operation in normal and emergency situations including nuclear accidents, sabotage and terrorism against spent fuel shipments on or off the plant site, adequate training of all personnel including plant operators, radiation monitoring personnel, site security, emergency response personnel, contractor personnel on site during outages or repairs or modifications to the plant, assurance that operators and others do not cheat on NRC or other applicable examinations including those for reactor operators (RO's), senior reactor operators (SRO's), welders, pipefitters, electricians, plumbers and equipment operators, and verification of the background and qualifications of each and every such person described above whose work affects or whose failures in work or omissions therein may affect the health and safety of the public adversely in connection with the normal and abnormal (including nuclear accidents) operation of the Harris nuclear plant, and does not provide adequate means including equipment, information, procedures, testing and personnel and training, to assure the accuracy of the facts under AEA or NEPA

and/or the health and safety of the public."

"No PWR(e) experience" or "lack of PWR(e) experience" or"PWR(e) construction experience" includes the meanings: "prior to assuming this person's duties at the Shearon Harris plant site, or some other job on-site at Harris, this person did not have, according to FSAR amended section 13.1.3 etc of 1982 or as that person's curriculum vita now stands, actual work experience in the construction of pressurized water reactors for electricity production , or experience in designing or operating such reactors, except as explicitly stated herein or in the FSAR, and is thus not sufficiently well qualified for supervisory position(s) such as this person now holds, in construction of a major pressurized water reactor plant for electricity production, which is of a design and size much different from naval reactors."

#1 Applicants should be required to install real time radiation monitors capable of reading gamma, beta and alpha radiation levels continuously and remotely in order to provide emergency response personnel with the information required to make decisions necessary to reasonably assure the health and safety of the public under conditions of radiological releases (radioactive materials) from the Harris nuclear plant to the environment.

Thermoluminescent dosimeters (TLDs) are only accurate within approximately plus or minus 30% and only tell what has happened in the past, not what is happening now. TLDs have to be picked up from their sites and read, delaying the access of emergency response personnel to information they need on a most prompt basis.

Further, a report of the NC Radiation Protection Section and the Radiation Protection Commission (December 1981 and January 21, 1982 letter from RPC chairman Ray Murray to NC Legislative Committee on Agency Review, with attachments) reports at page 4 "Due to equipment deficiencies and personnel shortages, environmental radiation surveillance around nuclear power plants and statewide is below minimum adequate levels. Activities around the two operating nuclear plants are having to decline steadily and there is no ability to provide such surveillance for the Shearin (sic) Harris Plant which is now under construction."

Further, at page 5, the same report says: "During 1980-81, DHR (Dept of Human Resources) had had to curtail its inspection, enforcement, training and environmental surveillance activities. Reduction in surveillance at C P & L's and Duke Power's nuclear power plants is now almost a semiannual occurrence." and refers to "lack of adequate funds and resources to adequately support even the existing staff". It also says (ibid)"D H R is having to become less responsive in the areas of public education, radiation user training, consultation and emergency responder training." CP&L Vice President p. Howe is a member of the RPC and must surely be aware of this situation (see letterhead of Murray 1/21/82 letter). It is thus very evident that this system is needed specifically for the CP&L Harris nuclear plant.

#2 CP&L should be required to have installed on its main Harris plant stack releasing radioactive gases to the environment two (2) pressurized-ionization monitors or equivalently capable equipment that can analyze not only the rate of emissions in gross terms (counts per second, etc) but the precise radionuclides being emitted and in what quantities. Such equipment should also be required on every discharge point for radioactive gases at the Harris plant, for analysis of radioactive liquid effluents before discharge, and at least ten such monitors in the environmental monitoring system around the plant, in order to be able to determine what radionuclides the plant is emitting in order for the Radiation Protection Section, Dept of Human Resources, State of NC, and EPA and NRC and emergency response personnel to better protect the health and safety of the public by obtaining timely and accurate

information concerning the specific radionuclides being released by the Harris plant and the quantities of such being released. The two monitors on the stack are to provide continuous capability for monitoring while one monitor might be malfunctioning, being serviced, or otherwise unable to give accurate readings, concerning the radioactive material being emitted by the plant.

I also believe that all towns and cities within 30 miles of the Harris plant should receive such pressurized-ionization monitors paid for By CP&L for the use of town personnel including emergency response personnel (fire, police, public safety, publick health and emergency response plan decisionmakers) to assure accurate and complete information on radioactive materials on the loose at any given location during a major radiological release, for the use of the emergency response personnel, health officials, medical personnel, and others, and to assure the public it is getting accurate information and thus to prevent panic. All of this is necessary to protect the public health and safety in such a major release, as is:

All such monitors should have both low and high-range capability so that they will not just "go off scale" if a major release occurs, but will simply be able to shift to another range on their readout and continue to give accurate information either remotely (by telephone line, for example) or to personnel on-site where the monitoring devices are.

(The devices described IN FSAR pp TMI-60-62 do not meet all of the above criteria + are thus inadequate)

3 Carolina Power and Light Company lacks the management capability to safely construct and operate Harris 1 and 2 due to a combination of all the following factors, and perhaps others to be found on discovery: (#4's allegations re Brunswick having to call in GE in emergencies are incorporated herein by reference)

(A) of the supervisory personnel on the Harris site, listed with their vitas (qualifications, education, work experience, etc) at pp. 13.1.3-1 to 14 of the FSAR amendment #2 just filed in 1982, only the site manager has PWR(electric) construction and operating experience. The others have only the PWR construction experience gained at their jobs on the Harris site (CPL is relying on ~~[illegible]~~ on-the-job training of top site construction managers). Site Manager Barsons, for all his experience, can't do or directly supervise everything himself (and there's no evidence he is closely supervising the work or all his assistants), and all his top assistants lack PWR construct'on experience at any other job.

Specifically, C.R. BGibson asst to the general manager has no PWR or plant construction experience in nuclear.

Startup and testing Supt. C.S. Hinnant had no PWR operating or construction experience, though he spent 13 months at Babcock & Wilcox, Lynchburg VA as an engineer some years ago and had a one month Navy orientation to nuclear at Newport News in 1969.

Operations supervisor JP Thompson III has no PWR construction experience tho he was a Senior Reactor operator for 2 years 1977-79; his B.S. degree is in Textile Technology.

Startup supervisor, N S Blair, has no electric PWR experience though he had 13 months of US Navy nuclear power school.

Startup supervisor T.C. Morton has no PWR(e) experience.

Harris Manager of Technical Support E.M.Steudel has A BS in electrical engineering and an MBA but no PWR(e) experience. He had Navy nuclear training in 1965

Engineering and Chem Supervisor Helm Lipa has no PWR(e) experience, but did have US Navy nuclear power training and nuclear propulsion prototype training. Lipa appears well qualified in physics & chemistry, but his qualifications in nuclear engineering are unclear at best. His job, alone of these, may not require such.

Admin. Supervisor L P Hancock has no PWR(e) experience before Harris (like the others), and has an Associate of Axxpplied Science degree in mechanical technology and an ICS diploma in mechanical engineering.

Maintenance manger R.B. Van Metre has 20 years in the nuclear navy but like the others he has no PWR(e) experience before Harris. He is well educated, B.S. in general engineering from Annapolis and MS in personnel management. He also went to Navy nuclear power school

Manager plant operations, J L Willis has a BSEE from Annapolis and 18 years in the US Navy. Like Van Metre he has no previous PWR(e) experience but has completed Navy nuclear power school(in 1958).

These are the top site personnel CP&L has at Harris now. They appear well qualified to operate a nuclear submarine, but except for the site manager they do not have any PWR(electric) construction experience before Harris.

(B) Likewise, CP&L's VP of Nuclear construction and operation, S.D. Smith, lists no PWR construction experience at all in his qualifications.

(C) CP&L has failed to use up-to-date information, in many cases information that was readily available to CP&L or originated from CP&L, in their FSAR and ER filed December 1981. This not only violates 10 CFR 51.21, 10 CFR 50.57(a) 1 thru 4 and (b), but it raises serious questions of CP&L's honesty in withholding information such as the 12.31.80 cost estimate of SHNPP units land 2 from

the official analysis of the plant's costs and benefits, and by CP&L's withholding of other information known to it. CP&L's failure to use up-to-date information and actual operating and other experience from other nuclear plants in its ER and FSAR further raise questions of CP&L's competence. If they can't use accurate and up to date information in these documents that they decide when to file, how do we know that they are giving the NRC up to date and accurate information now, or that CP&L will do so as a nuclear plant operator? If CP&L can't keep its own license application straight and accurate, how can their nuclear construction and operations be of sufficient quality to protect the public health and safety?

(D) Nuclear expert consultant A. Ronald Jacobstein, retained by the Public Staff of the NC Utilities Commission (his report filed in NCUC Docket E-2 sub 428 was judicially noticed by the NCUC panel in Docket E-2 sub 446, Feb. 17, 1982) has this to say about CP&L's Brunswick operations: "During the mid-70s, CP&L management, perhaps under the influence of the relatively good record of the Robinson plant or for other unknown reasons, did not properly address the staffing needs of the Brunswick station. As a result they were unable to respond to the acute needs of BSEP (Brunswick Steam Electric Plant) during the period 1978-1980. A backlog of problems developed during this time that simply overwhelmed the existing staff. These included:

Main condenser failure
TMI-related modifications
Torus modifications
Pipe support evaluation and modification
Radwaste failure
Main Steam Valve and recirculation pump problems.

(Jacobstein report at page 7-3, 1982)

Jacobstein goes on to say that problems continue to be addressed slowly because of management decisions to restrict manpower at the (brunswick) site for construction forces needed to backfit necessary maintenance items. Planned outages will therefore be longer and more frequent than otherwise possible, and above industry norms.

Jacobstein's report, which he discussed with CP&L prior to filing it, is just part of the evidence of CP&L mismanagement at the Brunswick plant, which it should be noted was the first nuclear plant that CP&L was actually in charge of buying and supervising construction on. In the 1979 NRC remand hearings on management capability of CP&L, CP&L witnesses and NRC staff testified that CP&L was more heavily involved by far in the construction of the Brunswick plant than of the Robinson plant (their other nuke plant) which was a Westinghouse ~~xxxxx~~ turnkey project.

To cite a couple of examples Jacobstein didn't detail: Fire protection at Brunswick is quite weak. Brunswick's electrical controls were designed prior to the Brown's Ferry fire and are thus more vulnearble to common-mode failures caused by fire. In an August 20, 1974 memo, C.E. "Doc" Murphy, head construction inspector of NRC Region II, laments the failure of various nuclear plants in Region II (including Brunswick) to meet proper criteria for fire protection and electrical control installation then in effect (prior to Brown's Ferry fire in 1975 which alerted NRC to take the problem more seriously). The fire at Brown's Ferry almost caused one unit to lose cooling -- water level dropped to within 1 inch of the top of the core according to IEEE, or 48" as NRC admits.

Yet CP&L is lobbying to get NRC fire protection regulations delayed. This suggests a cavalier attitude toward safety. Jacobstein makes a similar point when he observes that when Health Physics interfered with operating procedures to keep the plant on-line, the

operating prodedures usually took precedence at the Brunswick nuclear plant (e.g. pp 5.12-13, Report, ibid "Investigation, CP&L Brunswick Steam Electric Plant by A. R. Jacobstein).

Jacobstein's section 3 is a record of CP&L's bungling, understaffing and mismanagement during repairs and outages. It hardly suggests a competent utility or one interested in safety or efficiency or public health.

(E) Further, CP&L is the only nuclear plant operator in the nation to be caught dumping low-level radioactive wastes in local landfills. When the NRC found out about this situation (inadvertently), it ordered a check of all other nuclear plants for this situation, but CP&L was the only violator found. CP&L's Brunswick plant is also a very high producer of low-level radioactive wastes, indicating a dirty plant and sloppy operation. Jacobstein, section 5 p 12 and 13 describes how the design and repair deficiencies in the Brunswick plant led to improper unusual and abnormal modes of operation (because CP&L wouldn't leave the plant shut down until the problems could be fixed) resulting in unusual contamination conditions that health physics had to deal with and even anticipate as they changed. This again indicates sloppy management and placing a priority on electric generation over plant maintenance and repair and health physics. A Brunswick internal memo states that CP&L's plant there produced the highest amount of low-level waste (total and per size of plant) of any nuclear power plant in the US, and suggests "clean trash" (not very radioactive) be segregated and disposed of as regular trash if its radiation levels are measured low enough. No suggestions to assure that the levels of the radiation from the "clean" waste are carefully and accurately measured to avoid a recurrence of the radioactive-waste-to-landfill episode are mentioned

in the memo, whose main focus seems to be avoiding embarrassment to CP&L's nuclear program.

(F) The careful observer will also note that the period 1978-80 if inability to respond to problems at Brunswick goes beyond the period 1976-78 when inspector Floyd Cantrell of NRC had similar concerns about Brunswick as that plant's chief inspector. In the 1979 remand hearings, CP&L said they had those problems solved, and NRC staff tended to agree. But Jacobstein, in an independent review, says the problems continued. This issue needs the examination of a hearing, for if Jacobstein is correct, CP&L was at least playing fast and loose with the truth before the ASLB in Raleigh in 1979 in those remand hearings, and the NRC staff may have been asleep at their guard post with Cantrell gone back to Atlanta and TMI happening to distract their attention. If Jacobstein and others are correct, CP&L's credibility and safe management capability are very much in doubt due to the continuing sloppy operations at Brunswick, mismanagement (such as limiting the number of construction workers on site, poor outage planning, numerous mistakes in repairs, etc.), and having stated under oath to the ASLB in 1979 that CP&L was solving the problems at Brunswick and had things better under control.

(Some of the evidence from that hearing. e.g. CP&L's taking 17 months to install alarms on 2 watertight doors protecting the RHR system from flooding in the plant, to assure they were closed, strongly suggest otherwise. This problem wasn't finally fixed until during the hearings in 1979 -- NRC remand to ASLB -- and probably under pressure of the hearings. This doesn't suggest competence, see Dr. J.V. Leeds' questioning of CP&L witnesses about picking up a spare wire, etc., Tr. _____(1979)

(G) Moreover, CP&L's competence in constructing and repairing the Brunswick plant has been publicly challenged by people who have worked there, e.g. Ronald Shackelford of 105 Kenwood Ave, Wilmington NC 28405, phone 919-762-8530, and others in CP&L E-2 sub 116 evening hearing in Wilmington, NC in 1981. A reporter in the area got a job at the plant as an ironworker with no qualifications and was told to hide when the "white hats" (inspectors and supervisors) come around, by his foreman. Lack of supervisory personnel inside the plant was one of the management weaknesses at Brunswick raised by F. Cantrell and others at the remand hearings on CP&L's safe management capability in 1979. Shackelford also reported being hired as a Harris welder after failing the test for that job.

All of the areas cited above below indicate that CP&L was and is weak in nuclear plant management supervision at the Harris and Brunswick sites. CP&L lacks the management capability to run even the 3 nuclear plants it now has, much less 2 more, and the above evidence plus more to be obtained on discovery will likely be able to prove it. The Harris O.L. should not issue because the question of CP&L's management capability remains in doubt for at least all of the above reasons.

(H) CP&L's competence, good faith, management organization, attention to detail, and compliance with statements made to NRC and Atomic Safety and Licensing Boards (e.g. that in the 1979 remand hearing on management capability in this case) are called into question by the following examples and similar failures to carry out actions promised, required, or implied by actions of CP&L, NRC Staff, and the ASLB's in this case:

In the 1979 remand hearings referred to above, one large question was where the "SRO desirable" qualification requirement for senior Brunswick plant staff came from, and why CP&L didn't generally comply with it (i.e. most of Brunswick's senior staff didn't have SRO's licenses -- see NRC Staff testimony, e.g. that of Cantrell with attachment outlining top management at Brunswick and whether they had SRO's). Toward the end of those hearings, J.A. Jones (chief operating officer then and now, and now Vice Chairman of CP&L) testified that the "SRO desirable" requirement came from him, and that it probably should be deleted (though that doesn't mean such qualifications are not desirable for senior nuclear plant managers) See Tr. at _____-_____ (1979, Dockets 50/400-403) (before the ASLB at Raleigh NC, I. Smith, Dr. J.V. Leeds and Glenn O. Bright).

Yet in the Harris FSAR, Figure 13.2.1-1 "Training Schedule" for SHNPP, we find that "SRO[1] Background for license, desirable" is attached to the General Manager, Manager-Power Production, Plant Manager, Perf. & Test Supervisor, Engineering Supervisor, Superintendent main(enance) and others. Of those posts yet filled, it does not appear that any of them (FSAR 13.1.3) has or is qualified for an SRO, the operations supervisor (another post,not listed above) being the only one identified in 13.1.3 as having held an SRO or being qualified or having the background for same.

The questions this whole matter raises are: If SRO's are really desirable for these jobs (or background for the license, whatever that means), why don't more of the people CP&L is getting into these jobs (senior Harris plant management) have them? Is CP&L seeking to duplicate its poor performance

at Brunswick by similar means? and

If the "SRO desirable" qualification really should have been ~~xxxx~~ eliminated or modified, why can't J.A. Jones, the most senior operating official of CP&L, who originated the qualification himself (so he testified), get it changed or, if it stands (as ~~Txxix~~ Fig. 13v2.1.-1 indicates), get the CP&L hiring process to comply with it? Answering these and similar questions is important to determining CP&L's management capability for an additional 2 nuclear plants when they already run 3 (with very questionable results and practice at 2 of them, i.e. Brunswick 1 and 2~~2~~).

(H2) CP&L's management capability filings consist mostly of organization charts and plans. Without seeing the actual individuals who fit into these boxes, charts and plans, their qualifications, how well they work together, and ~~w~~whether these individuals are (or can be proved to be) able to run the Harris project together with the other nuclear operations CP&L's general office is responsible for (Brunswick & Robinson2) (this last applies to the general staff, the Harris plant staff might have to be diverted to deal with continuing unsolved problems at Brunswick and/or Robinson 2, e.g. steam generator replacement, torus modifications, fire protection, radiation protection) in a manner that protects the public health and safety, such plans cannot be realistically evaluated. Therefore at this time I contend that the levels of staffing specified are insufficient for Harris and the CP&L company as a whole in view of CP&L's record of continuing and worsening nuclear plant problems (including all those at Brun~~x~~swick, radiation protection and steam generator leaks at Robinson2, etc.), that the individuals

to be named to fill those positions open in the staffing charts submitted by CP&L are or will be insufficiently qualified by training, experience, temperament, psychological stability and ability to work effectively with others on difficult problems, to deal with the level of nuclear problems that CP&L can reasonably be expected to be having, based on CP&L's record at Brunswick, its deteriorating operation at Robinson 2, construction and design defects at Harris (including the results of using workers with lowered morale due to pay cuts, unqualified welders, inspectors -- who, e.g., can't read blueprints accurately, or just check off what tools are used -- installation of nonconforming material on the next shift after it had been rejected on a previous shift, particularly early in construction, as it applies to rebar, weldments, drains, piping, wiring, containment liner, base mat, equipment supports (especially for safety-related loads), and such other defects and deficiencies of construction and design as are now known (e.g. defective steam generators, vibration problem in Westinghouse model D's, corrosion, denting, pinching, pitting, "green grunge", leaks etc. in steam generator tubing, likelihood of major steam generator repairs or replacement being required based on the record of Surry, Turkey Point, Robinson 2 and other plants and on failure of water chemistry changes to solve the corrosion problem, bimetal corrosion between the alloy in the tubes (Inconel at Harris -- I've requested the exact alloy info from NRC) and tube sheets (steel), and piping and generator casings (steel) directly and mediated by feedwater and by primary coolant, also affected by zircaloy in primary system, another major metal surface that can effect or increase bimetal corrosion on the S.G. tubes) or may be discovered.

FSAR Table 5.2.3-1 says various types, one or another — actual not specified here

(I) Applicant CP&L, by giving a temporary 15% pay cut to hundreds of its employees now being transferred to the Shearon Harris nuclear plant (statement of CP&L spokesman Mac S. Harris, reported e.g. Durham Morning Herald, V/9/82--discovery may be required to pin down the extent and nature of these transfers, the period of the pay cuts, if its end is known, etc.) is precipitating there the same kind of situation which, at its Brunswick nuclear plant in 1974-75, precipitated poor staff morale, high staff turnover, and an inability resulting from those and other factors (including inadequate management and inadequate resources) to make necessary repairs to and operate the Brunswick plant in a manner that protected the health and safety of the public adequately.

Further, CP&L at Brunswick in 1974 was unable or unwilling and did not have the necessary staff to repair safety-related problems and deficiencies faster than they occurred, leading to a growing backlog of problems unfixed and unsolved, failure to conduct proper safety reviews of repair work, forced overtime that compounded staff fatigue and poor morale (particularly when combined with pay cuts). Such factors contributed, e.g. to the January 1976 explosion and effective destruction of the augmented off-gas (AOG) system at Brunswick, which has still not been returned to service as of 1982, resulting in higher levels of radioactivity being released to the atmosphere and contributing to the radioactive cesium contamination of the beach across the river from the Brunswick plant, at a state park, in 1980.

Obviously, pay cuts coincident with transfers to the Harris site will not result in good associations with work

on the Harris nuclear plant. Such dissatisfaction will lead to sloppier construction and startup testing practice, and to an accumulation of unsolved problems that can affect public health and safety adversely, as they did at Brunswick. Further, this action shows CP&L management has not learned the lessons of their understaffing, underpaying, causing high turnover and poor morale at Brunswick. The Brunswick plants still have at least 3 more years of extensive modifications ahead, even if CP&L succeeds in getting out of the NRC rules on fire protection as they seek to, according to CP&L's 1981 form 10-K filed with the Securities and Exchange Commission (SEC), see under "Nuclear Matters". These include torus modifications to withstand accident blowdown loading and/or earthquakes, repairs and replacement of condensers, and fixing numerous other design defects and deficiencies in that plant.

CP&L's treating its Harris workers in 1982 as it did its Brunswick workers in 1974-75 is likely to precipitate the same sort of conditions at Harris that led NRC inspector Floyd Cantrell to raise serious questions as to the management capability of CP&L to operate nuclear plants safely, as of 1976-78. CP&L's pay cuts for Harris employees as they move to work at the site indicates that CP&L is willing to precipitate similar problems at the Harris site. This action may have the same sort of cause in that in 1974-75 a large amount (up to 103%) of CP&L's earnings was AFUDC (not real cash) according to then-Chairman Shearon Harris. Present CP&L chairman Sherwood Smith testified before the NC Utilities Commission in 1981 that above 80% (97% as I recall) of CP&L's earnings in one recent period had been AFUDC. But for CP&L to repeat, in a similar

and a don't care attitude among workers on-site, resentment of ~~xx~~ other workers whose pay wasn't cut, and resulting conflict, distraction from good work practice, and a general willingness to overlook or cover up construction errors, noncompliance with codes and NRC regulations, (e.g. for welds, wiring, completing the containment dome, sealing containment penetrations, testing the integrity of the primary system, leak-testing piping and pressure vessels, etc.). Pressure from top management to cut costs will compound these problems by further lowering morale, and since it almost always costs more to go back and fix work done in error, pressure to cover up such errors and noncompliances (as listed above will increase. The result will be a power plant with a greater number of safety-related defects concealed in it, due to the influence of CP&L management policy as exemplified by the pay cuts coincident with transfers of hundreds of employees hired for Harris but trained at other locations to the Harris site, and other pressures to cut costs. The difficulties of CP&L's Brunswick plant, which continue today, illustrate well the long-term results of such short-sighted CP&L cost-cutting policy in 1974-75. If Harris construction is also rushed to save money (as CP&L did on Brunswick 2 in 1974) these problems will be further compounded at Harris just as they were at Brunswick. The more competent workers will be more likely to seek jobs elsewhere, due to the pay cut, or to perform less well, due to resentment, if they stay with CP&L. The result will be an overall degradation of the quality of CP&L's Harris workforce and its performance, as the result of CP&L management actions. That, in turn, will compromise public health and safety protection at Harris and

increase the probability of nuclear accidents there, due to concealed noncompliances with applicable x codes and regulations, lower staff morale resulting in more human error, and so on. These effects are difficult to specify in greater detail now, since they have not but just begun to happen and little if any information on their extent is available, except the results of what CP&L did at Brunswick in 1974-75, which is wwell documented in the reports of Cantrell and other NRC inspectors at Brunswick, and in the transcript of the NRC 1979 remand hearings on CP&L's safe management capability held in Raleigh. One striking example from that hearing was CP&L's repeated failure to get door-open alarm lights run from two watertight doors necessary to protect the Brunswick RHR system from flooding (shorting it out so it wouldn't work,e.g.) at the -17 foot level, up to the control room, so operators would know when these doors were left open, over a period of some 18 months. Inspector Cantrell cited CP&L several times for violations in regard to these doors being left open and made recommendations on what CP&L should do to fix them -- which CP&L didn't do for many many months. The pressure of other things going wrong at the plant was cited by CP&L and Cantrell as a basic reason things like this at Brunswick didn't get fixed in a timely manner. That CP&L should take steps at Harris that are just like steps that led to this situation at Brunswick indicates unsound management, not capable to construct another nuclear plant and operate it safely when they can't even run well the 3 plants (nuclear) CP&L already has.

cash crunch situation, an action that led to widespread morale and staffing problems at Brunswick in the 1970s, which problems have not been resolved to date (see, e.g. Report of Investigation by A. Ronald Jacobstein, consultant to NC Util. Commission Public Staff, sections 3, 4 and 7, Feb. 1982, Docket E-2 sub 428 and judicially noticed in Docket E-2 sub 446 on Feb. 17, 1982), indicates management that cannot learn from its errors.

Jacobstein describes deficiencies and mistakes in planning, record-keeping, outage scheduling, radiation protection, maintenance, and other fields (contention 3D on management capability gives more details on this and is incorporated herein by reference). CP&L, evidently feeling pressure to cut costs, put Brunswick into this situation when completing it and beginning operations in 1974-75.

Completing Harris under similar conditions in 1982-85 is not consistent with good management, high quality nuclear construction ("quality must be built in, it cannot be inspected in" to nuclear plants -- NRC Chairman N.J. Palladino, 1981), or avoiding errors in construction and design. ~~Payxmtsmc~~ pressure to cut costs will lead to cutting corners in construction, compounding an already deteriorating situation (see, e.g. "...Building a 'Bargain Basement' power plant, Western Wake Herald, 1981, reporting charges made by workers at the plant site, including rampant drug use, improper installation of materials, inspectors who can't read blueprints, unqualified welders and other personnel at work on the site, etd.)

Specifically, in addition to the above, lower morale among workers caused by the pay cuts and by those pay cuts coming when they move to the Harris site will lead to sabotage & failure to construct SHNPP to applicable standards, rules & requirements.

4 Applicants' "safety analysis" is deficient and insufficient to protect the health and safety of the public because it assumes (in general) only a single failure at any one time. The issue of multiple and common-mode failures is not addressed in any comprehensive or inclusive manner in the FSAR. This issue is particularly relevant to the Harris plant due to the large number of errors and reportable occurrences in engineered safety systems, emergency cooling systems, and other systems at the Brunswick nuclear plant, which CP&L was more heavily involved in building than its Robinson plant (which was a Westinghouse turnkey project built for CP&L) --see J.A. Jones testimony in remand hearings on safe management capability in this docket, Tr. _____ (1979); because most of the Harris onsite supervisory and management personnel named in Amendment #2 of the FSAR have no experience in PWR construction or operation for electric power generation except whatever they've picked up on the Harris job (nuclear powerplant construction management and supervision on-site is not a place for on-the-job training for the senior managers) -- as detailed in contention 3 incorporated herein by reference for specificity and detail; because there is no evidence that Applicants have plans or procedures for dealing with multiple failures; because an Integrated Control System (ICS) computer & related equipment such as that planned for Harris without a backup computer, which is not qualified for fire or accident conditions nor for earthquakes, is surely capable of producing erroneous signals that cause multiple failures; because the Harris control room is a very old design, out-of-date with respect to both instrumentation and human factors, as well as with respect to TMI lessons learned; and because the Harris plant itself is an outdated design having been delayed many years by Applicants' lack of financial capability to construct it and lack of need for it, and thus the plant design includes less protection against common-mode failures than plants

of more recent design; because Applicant CP&L, at its Brunswick plant (upon information and belief) has been more than once unable to determine what to do to control and operate that nuclear plant safely, and has had to call in experts from the nearby G.E. nuclear fabrication and fuel facility to show them what to do (and what not to) -- I'll need discovery to complete the details of this one, and probably a set of subpoenas to G.E. -- but there is no Westinghouse facility full of PWR experts close enough to the Harris plant to provide the same "bailout service for incompetent nuclear utilities" that CP&L has been receiving at Brunswick from the G.E. facility at Wilmington. Upon information and belief, pending discovery, the incidents at Brunswick could have had quite serious consequences if not brought under control within 30 minutes to a few hours, which CP&L with its own personnel and resources was unable to do, exposing the public's health, safety and property to serious risks.

5 An operating license for Shearon Harris Nuclear Power Plant units 1 and /or 2 may not issue because under the Atomic Energy Act, the U.S. Constitution and [redacted] U.N. Universal Declaration of Human Rights (to which the US is a treaty signatory, which incorporates the Declaration as the "supreme law of the land" under the Constitution), neither Congress nor the Nuclear Regulatory Commission have the authority to authorize any activity which kills citizens, wreaks genetic damage on them, causes diseases, or infringes their civil liberties. See (Honicker v. Hendrie?) [redacted] U.S. Court of Appeals, DC Circuit, 1982. [redacted]

6 An operating license for Shearon Harris Nuclear Power Plant units 1 and/or 2 may not issue because Applicants Carolina POwer and Light Company and NC Eastern Municipal Power Agency ("NCMPA #3 until December 1981) are incorporated under the laws of North Carolina and as such are not and cannot be authorized to violate the protection of Section 19 of the NC Constitution which provides the same protection of "life, liberty and property" as does the US Constitution. Neither NRC nor the US Congress may by any law (such as the Atomic Energy Act) overrule this provision of the North Carolina Constitution, nor may NRC or Congress order or authorize any North Carolina corporation(s) to violate the North Carolina Constitution. The court decision cited in contention _____ above (incorporated herein by reference) clearly affirms that the provisions of the US Constitution re taking of life, liberty or property (identical to the provisions of the NC Constitution cited herein) without due process of law apply to the licensing of nuclear power plants. Since the operation of the Harris nuclear

have the effect of killing some persons and injuring others, without due process for those persons specifically killed and/or injured (see, e.g. NUREG 0880 at xviii, ALAB-664 re 30 or 40 radon-induced deaths per 1000 MWe reactor-year; NUREG-0757 re up to 67.5 deaths/1000 MWe-year; or even Table S-3 which does not include fully the health effects of effluents from the nuclear fuel cycle). These numbers are not conservative, in my view, but the point is that even one death from the Harris operation would violate the North Carolina constitution. No North Carolina Corporation(s) such as CP&L or NCEMPA ("Agency") the applicants in this case, can be authorized to violate the North Carolina Constitution. Nor can any federal agency, such as NRC, authorize them to do so. Therefore the N.C. Constitution and N.C. law on corporations, etc. prohibit the operation of the Harris nuclear power plant units 1 and 2; and the NRC is unable to override this prohibition.

7 Applicants' "safety analysis" and the SER is deficient and insufficient to reasonably protect the health and safety of the public due to its lack of a comprehensive failure modes and effects analysis (e.g. as described by Demetrios Basdekas of NRC in his differing professional opinions, BN-80-15) for the entire SHNPP. Without same, the public health + safety are exposed to unreasonable risks from unanalyzed failure modes that release radiation to the environment, e.g. reactor vessel head bursting thru containment, APS, 1975.

8 The FSAR and SER and ES and EIS and ER are deficient because (A) they do not comply with NRDC v. NRC, US Court of Appeals, DC Circuit, decision by Judges David Bazelon & George Edwards, April, 1982, invalidating Table S-3 of 10 CFR 50. (B) The health effects of the effluents mentioned in the table need to be taken into account whether this decision is affirmed on rehearing or further appeal or not. This is particularly true in the light of the 11 million year period in which spent fuel is more radiotoxic than the parent ore from which uranium was mined for the nuclear fuel cycle (B. Cohen, Prof, U. Pittsburgh) and because of the high efficacy of certain radionuclides such as Rn-222, Pu-239, Sr-90, Cs-137, Co-60, Ni-59 and others released in the nuclear fuel cycle in lodging in the human body and causing cancer, either when absorbed from nuclear activities directly (including tailings and plant operation) or when concentrated as explained in NRC translation 520 in the food chain. (C) The NRC's present analysis of food chain concentration is wrong and fails to protect the health and safety of the public in that it is based on ~~faked~~ fudged AFC experiments involving (1) the use of soils known not to absorb or adsorb much of radioactive particles in the air (2) the baking and ultraviolet-light sterlilization of such soils to prevent microorganisms from mobilizing radioactive material in the tests, as they will and do do in reality (3) the transplanting of

fully grown plants into said soils so sterilized, preventing uptake of nutrients including radionuclides as would be normal from plants grown from seed in ~~xxxx~~ soils contaminated with radionuclides emitted by the nuclear fuel cycle (4) removing said plants after as little as 3 days and analyzing same, which is totally unrealistic in view of the 20 to 200 day growing periods of many food plants, e.g. wheat, beans, corn, vegetables, potatoes, nuts and others. (D) NRC's analysis is further not conservative in that it does not use the larger or largest values for concentration of radionuclides obtained by scientific research, e.g. those summarized in NRC translation 520; and (E) in that it systematically underestimates not just the radiation doses from internal and external emitters for all the above reasons and others, but also underestimates the health effects of radiation doses actually received, as detailed e.g. in the work of Gofman (see, e.g. Radiation and Human Health, 1981) re cancer doses, genetic defects, underestimation by the "threshold hypothesis" and the "linearity assumption"; Mancuso, Stewart and Kneale re health effects of low-level radiation (1979-80); K.Z. Morgan, J. Rotblat, E. Radford and others who support on health effects grounds a lowering of the occupational exposure standards for radiation by a factor of 2 to 10; and other current literature in the field of radiation health effects.

9 FSAR 3.11C and the SER do not establish compliance with NUREG -0558 or NRC's rules on Environmental Qualification of Electrical Equipment for the Harris Plant, nor was the report referenced in 3.11C available at the LPDR prior to 14 May 1982. Therefore I contend that the qualification of electrical equipment (including controls, wiring, motors, valve operators instrumentation, etc. required to perform such vital safety functions as initiating the ECCS and RHR systems, running the reactor coolant pumps, operating relief valves, establishing in-core pressures, temperatures and radiation levels, knowing the positions of valves in the main steam, primary, ECCS, borated water, pressurizer relief, reactor relief, and other systems, to cause the control rod drives to operate (required for SCRAM and safet shutdown), knowing whether valves from containment to atmosphere or to auxiliary building(s) are open or are closed, isolating containment in the event of a radioactive release inside containment, supplying feedwater to steam generators, and operating controls and instruments in the control room that depend on the information conveyed,by, or the operation of, any of the above, which is necessary to protect the health and safety of the public, is not sufficiently established for Harris by the FSAR and ER and SER and ES, is deficient, in error and lacks up-to-date information, both in the FSAR, where section 3.11C omits discussion and makes broad, blanket assertions unverified and unverifiable on the basis of now-available information, and particularly in those reports referenced above, and others, which do not now exist, and for which some of the up-to-date information as of their date of publication (e.g. operating experience of electrical equipment at PWRs in December 1982) does not now exist.

#10 The material incorporated by reference in FSAR section 1.6, as listed there, Table 1.6-1 contains less than two dozen items (out of a hundred or 50) (or thereabouts) dating later than 1977, while most date from 1975 or before. Applicants and NRC staff have not proved that this information is now up-to-date and accurate enough for use in protecting the health and safety of the public. Obviously, none of these studies before 1976 takes account of the operating history of Westinghouse large PWRs such as Harris (greater than 700 MWe) from 1976 to the present. E.G. WCAP-8768 incorporates no such, WCAP-8587 Rev 2 and supplement 1 to WCAP-8587 date from before TMI, as do the analytical models of WCAP-8785 and WCAP-8720, WCAP-8678, WCAP-8183 rev.8, WCAP-8330etc. Westinghouse corporation, authors of many of the studies, has a vested interest in selling nuclear power plants which may lead its researchers and authors to bias their reports in such a way as to (1) reduce the cost of safety-related modifications required for such Westinghouse-sold nuclear plants (ones using a Westinghouse NSSS), thus increasing salability but risking the public health and safety; and/or (2) defend the reasonableness of design descisions made by Westinghouse and its subcontractors, in order to avoid embarrassment, out of favoritism for the company and their own work, or in order to avoid expensive modifications referred to in (1) above which would reduce the salability of Westinghouse nuclear reactors and thus threaten the jobs of the author(s) and researcher(s); and/or (3) because of direct or indirect pressure from their superiors for any of the preceding reasons; and/or (4)in order to prevent public knowledge or, or concern over, defects in the design of Westinghouse nuclear plants. Any or all of the above factors can and do compromise the public health and safety. E.g. WCAP-8976 underestimates the likelihood & effects of control rod logic failures.

e.g. Westinhouse withholding info on model D steam generators (which Harris has) is such a case.

I haven't got WCAP-8682 available; WCAP-8683 of Dec. 1975 does not include the effects of re-racking to store more fuel in spent fuel pools.

I believe the above considerations also apply to WCAP-8584 and WCAP-8760 or 4/76 re engineered safeguards actuation for PWRs, but without seing the proprietary version (as in other cases listed herein, e.g. WCAP-8682 is proprietary) I cannot determine if the public version is as truthful as the proprietary version. WCAP-9230 and WCAP-8424 and WCAP-9166 are also subject to the above factors for minimizing the effects of accident conditions to the detriment of the health and safety of the public.

In addition, according to Table 1.6-1, NRC Staff has not completed its review of most of the above-named documents, nor others vital to the safe functioning of the Harris plant. These are symbolized "U - Actively under formal NRC review" in section 1.6's legend to the Table 1.6-1 of the FSAR. These reports, though referenced "in support of this and similar applications" are not in the LPDR as of 5/16/82. The Staff's not having completed review of these reports means that they have not been accepted as adequate to protect the public health and safety. In view of the transfer of NRC personnel to licensing activity from such other actions as reviewing these reports, there is a likelihood that NRC review will not be timely enough nor accurate enough nor thorough enough to assure the public health and safety in connection with the Harris project, particularly since Harris is such an old design (from 1971 as somewhat updated) that it may not receive sufficient attention compared to more modern designs, and since Applicant CP&L is in such financial straits due to the high cost of SHNPP and its high amount of AFUDC in earnings that it has given a 15% pay cut to employees being sent in the hundreds to the Harris site at the time of this filing, thus preventing CP&L from conducting more extensive review of these safety matters also.

To make this contention more specific will require discovery to NRC Staff concerning review status of the above-mentioned reports, number of personnel assigned to them, their work loads, their procedures, their opinions of the adequacy of the reviews, and any anonymous studies of such opinion (where the opinions can be given without having one's name attached to it, such as NRC has done with IE inspectors, see record in 1979 remand hearings on S. Harris/CP&L management capability, Board notification referred to therein, and IE reports of its inspectors views),

And discovery to CP&L to find what further reviews or checks of the above-mentioned documents CP&L is conducting or has conducted (generally, I have found none in the FSAR where such documents are referenced. FSAR Section 15, e.g. at 15.6, refers to the reports as basis for the "analysis" which is often simply a description of the report's results with no criticism of the report's accuracy, assumptions, etc.), what such further reviews consist of, who does them, what their qualifications are (and has CP&L got people in their employ who are qualified, in CP&L's opinion, to conduct such further reviews), how much time they spend on it, where it fits into their job description(s), what priority it has in their work schedule, what results and reports they have produced, and to get copies of same. Many of these same questions are of course appropriate for discovery to NRC Staff about their reviews of the documents mentioned above.

11 Applicants' FSAR and the SER and ES are deficient and in error because they do not take account of the fact that polyvinyl chloride (used for cable jackets in nuclear plants, including inside the containment in high gamma radiation flux areas such as those near the reactor, hot and cold leg piping of the primary system, reactor primary coolant pumps, etc.) and polyethylene, used as cable insulation, deteriorate much more rapidly under long-term doses of gamma radiation than they do when exposed to the same total dose over a much shorter period of time (which is how these materials, PVC and PE, are tested for service in nuclear plants), as shown by the work of K. Gillen and R.Clough of Sandia Laboratories. The tests these workers conducted show that the cable jackets and insulation become embrittled by the radiation's breaking chemical bonds in these polymers (which are long groups of linked chemical units called "mers"), allowing oxidation of the plastics PVC and PE which makes them brittle.

This accelerated embrittlement in the presence of gamma radiation and oxygen raises many significant accident and loss-of-control possibilities, due to anything that suddenly shocks cables and could thus cause embrittled insulation to fall off (e.g. earthquakes, water hammers as MSIVs close after a SCRAM, steam hammers, a worker brushing against them or striking them e.g. with a mop handle). Or the insulation could fall off under the influence of vibration, e.g. from the reactor coolant pumps, or when extremely embrittled, could fall off of its own weight. Where cables carrying control signals, power to motors for the ECCS, RHR and primary coolant, power to control pilot-operated valves, or signals from important instruments inside containment,

loss of cable jacketing or insulation would lead to short circuits and thus: erroneous information transmitted, failure to transmit control signals or information and ~~information~~ instrument readings through shorted-out wires, failure to transmit power to vital safety equipment, e.g. to the RHR pumps, ECCS pumps, or reactor coolant pumps or any or all of them after a SCRAM, water hammer, earthquake, reactor trip, turbine trip, loss of feedwater, or any other event that causes vibration (e.g. normal operation of RC pumps, beginning operation of ECCS pumps or RHR pumps, HPCI or LPCI) or sudden shock. Such failures of controls, instruments and pumps would clearly compound many accident sequences, escalating trivial incidents to the Class IX level in many cases. For example, if an ordinary turbine trip led to a reactor trip and the water hammer as the MSIV closed caused cable jacketing to fall off cables supplying power to one or more reactor coolant pumps or controlling their operation, and the cables shorted out (very likely if bare) the pumps would go off, the reactor temperature would rise, and the ECCS would automatically turn on and a relief valve open to stop pressure rise on the primary system. The vibration of the ECCS pumps starting could cause more cable insulation to fall off, particularly on wires near them like their controls and power supply. If either control or power supply to the ECCS pumps failed, the undercooled reactor would not be getting much additional coolant. Moreover, shorted wires could erroneously signal the operators that ECCS pumps and reactor coolant pumps were operable and working, when they were not. High radiation levels inside containment would prevent anyone from going in to look, as primary coolant escaped through the open relief valve to reduce temperature and pressure in the primary system. As a result the reactor could seriously overheat, form steam

voids in the core (further reducing effective cooling) and give the operators reading it another case of "failure modes the likes of which have never been analyzed" as at Three Mile Island unit 2. In this case, provided the core pressure-temperature monitoring instrument lines had not also shorted out, the signals from them would indicate rising temperature and falling pressure; meanwhile the erroneous signals from shorted wires would be indicating the ECCS pumps were on as were all the reactor coolant pumps. It is unlikely that the operators could diagnose the situation accurately soon enough to prevent serious damage to the core. Under post-TMI instructions, they might consider it enough to leave the ECCS "on" as it was indicated to be. In such a case, the overheading core would soon get hot enough to release substantial radioactivity to primary coolant (and thus to containment via the open vent valve, standard practice now being to leave the ECCS on and blow the excess from a "solid" system out the relief valve) and to react the zircaloy fuel tubes with remaining water and steam (about 1990 F I think--can amend this to correct it) to form hydrogen. Add hydrogen to the shorted wiring and you get an explosion which would cause containment penetrations sealed with epoxy to fail suddenly by reverting to the 2 chemicals which combine to make the epoxy. Heat, moisture, pressure and radiation can all cause epoxy to fail in this way, and all would be present inside containment under the conditions described, especially during and after the pressure spike of a hydrogen ignition/explosion. Radioactive steam, halogens, noble gases and other radionuclide including cesium, which would be boiling out of the core at temperatures above 2000 F as the core continued to fail to be cooled, would then escape through the failed containment penetration(s) to

the auxiliary building and/or directly to the atmosphere, perhaps penetrating to the control room also through cable trays and pathways, thus compounding difficulties for the operators still more. The potential damage to public health and safety, and the release of radioactive material to the atmosphere, easily equals or exceeds that at Three Mile Island under this scenario.

It is important to realize that where cables are thickly grouped or bunched, or inside conduits not subject to visual inspection, embrittlement, cracking and degradation of control, instrument reading and power cables could not be readily detected, even if it had progressed very far. Any shock, even normal operation of an air pressure line, much less an earthquake, nearby plane crash, valve operating, or a worker bumping or pulling a cable on purpose or accidentally, could lead to a massive short circuit affecting numerous systems and instruments all at once. In the event that the initiating event was also part of an accident sequence, the shorted cables would likely compound the seriousness of the event, and further shocks, caused, e.g. by equipment turning on to mitigate the damage already done and problems already caused, could cause more insulation to fall off cables on which it had become embrittled, further compounding the accident. Applicants' FSAR and the SEP take no account of this possibility, do not analyze it sufficiently, do not provide enough mitigation for it, do not decree inspection standards for cables that can prevent or detect such embrittlement before it risks short circuits and their attendant risks as described and exampled above, do not provide for the use of cable insulation and jacketing that will not degrade under such radiation exposure,

and otherwise fail to adequately protect the health and safety of the public.

This issue is particularly applicable to the Harris plant because of its very old design dating from the early 1970s in which many cable paths are not adequately separated (raising the odds that degradation and embrittlement of jackets and insulation inside a larger bundle of cables won't be detected until it causes an accident or seriously compounds one). It is also particularly applicable in that Applicant CP&L has a history of delaying and failing to comply with cable separation and installation standards, e.g. at Brunswick, of delaying and being inadequate in fire protection, and in general of giving production priority over shutting plants down to cure major safety defects, e.g. at Brunswick 1977-78 and 1978-80, and continuing as CP&L petitions NRC many times to delay implementation of safety upgrades and equipment repairs and modifications at Brunswick; e.g. also at H.B. Robinson plant, see NRC inspector's anonymous comments referenced in Staff Exhibit ____, NRC remand hearing on CP&L safe management capability, Raleigh NC 1979. Contentions 3+4 on safe management capability (4 as incorp'd into 3) are incorporated herein by reference as further evidence this issue is particularly applicable to Harris due to CP+L's lack of competence as shown by their Brunswick record + otherwise as detailed therein

#12 Applicants' FSAR, ER, the SER, and the ES do not properly include the environmental effects of dumping low-level radioactive wastes produced at SHNPP into the ocean, which EPA has proposed a rulemaking to allow (1982). This issue is particularly relevant to SHNPP as a special case because the State of NC is not now a member of any radioactive waste disposal compact, has no land burial facility for low-level radioactive wastes, and thus may in 1986 (well within the operation period anticipated for Harris 1 and 2) have no other alternative means of disposing of the low-level wastes produced by the Harris project, other than ocean disposal.

#13 Applicants' and NRC's ER and ES and SER and FSAR don't provide proof that there will be adequate radiation monitoring around the SHNPP site, or that there will be adequate independent monitoring to check if CP&L is supplying accurate figures from its monitoring to NRC, the public and emergency response planners, in the light of the facts about inadequate funding in the State of NC for such programs as noted in contention #1 above (incorporated herein by reference), cutbacks in EPA funding for radiation monitoring (e.g. as shown in the federal budgets for fiscal 1982, 1983, 1984, 1985 as currently proposed, and in CED 78-27 (US GAO, 1.20.1978) see pp i-v, vi and viii especially p iv and 22-23 re inadequate EPA monitoring nextwork, and other relevant documents available), NC State budget deficits, and the financial difficulties of Applicant CP&L as complained of regularly in rate increase proceedings before NCUC and SCPSC (e.g. NCUC Dockets E-2 sub 391 (1980, sub 416 (1981) and sub 444 (1982) and subsequent filings to be made). In radiation, what you don't know CAN hurt you since the public has no independent means to detect it or avoid its harm if accurate monitoring isn't there.

 1st Section 2 of Weiss Eddleman Supplement to petition to intervene (5-14-82)

14 Applicants' Cost-Benefit Analysis under NEPA is seriously in error because in estimating benefits to be derived from the operation of the Harris Units 1 and 2, it fails to take into account both the short-run and the long-run price elasticity of electric demand. When these elasticities are applied to the known capital costs of Harris units 1 and 2 (CP&L quarterly CWIP progress reports to NCUC as of 12/31/80, 3/31/81, 6/30/81, 9/30/81 and 12/31/81 put Unit 1 at $1,999,879,000 in Sept 1985, and Unit 2 at $1,271,184,000 in March 1988 or March 1989 (cost not updated for 1 year delay, see Note 9 to 12/31/81 report), all data Schedule II, p.1 of the referenced reports), the short-run reduction in demand will eliminate the consumption of most of the output of the units; and the long-run reduction in demand will eliminate the entire output of the units (or more) from consumption.

Such elasticities are given by Lester Taylor, Bell J. Economics Vol. 6, #1, pp 74-110. At page 88, Taylor presents Electric Power Research Institute summaries (Task Force 2, Elasticity of Demand, Topic 2, January 31, 1977, page 12a) showing a range of shortrun elasticities of 0 to -0.89, and longrun elasticities of -0.0 to -2.37 Where combined longrun and shortrun elasticities were studied, the range is -0.90 to -2.10. The average shortrun elasticity is about 0.2, which is a useful value for projections (see, e.g. testimony of Drs. John O. Blackburn and E. Roy Weintraub, economics professors, Duke University NCUC Docket No. E-100 sub 35, July 1979; testimony of Dr. Weintraub, Docket No. E-100 sub 40, March, 1981). Virtually all of the longrun elasticities given are -.51 or more negative; the average is about -1. Of 28 studies, only 7 give values of between -1.0 and zero; 2 give -2.00 and -2.37; the rest are between -1.00 and -2.00.

Although I don't intend to say that this citation is all the relevant evidence on price elasticity of demand, it does show that there is a substantial basis in the economic literature and in the testimony of experts for considering price elasticities of electric demand about -0.2 in the short run and about -1.0 in the long run.

Further evidence re long-run price elasticity of demand was given by CP&L's own witness Dr. Robert M. Spann before the NRC in 1977 in this very docket (ASLB hearing transcript 1729 fff; prefiled testimony admitted as if read, 1731; follows p.1731 in the record). Attachment 5 to that testimony uses Table 4 of Taylor's "The Demand for Electricity: A Survey" Bell Journal of Economics 6, 1 pp 74-110. Price elasticities are as follows from Taylor: Residential, -1.02 to -2.00; Commercial, -1.36; Industrial, -1.25 to -1.86. Spann's estimates ("NCUC STAFF" in Attachment 5) gives price elasticities of -.70 for residential, -.735 to -1.066 for commercial, and -.1 to -.5 for industrial.

To sketch the implications: CP&L's NC retail rate base, exclusive of Harris CWIP, is now about $1.6 billion (NCUC Order, Docket E-2 sub 416, Final Order Feb 12, 1982). Adding in the Mayo plant in 1983 (Mayo 1) might bring this to as much as $2 billion in 1985, net of accumulated depreciation. Harris #1 will have an NC retail allocation of about 75%, i.e. a $1.5 billion increase in NC retail rate base, or a 75% increase in fixed charges. Harris 2 would lead to a further increase in 1989 of about $950 million (NC retail), i.e. a 47.5% further increase in fixed charges above the 1985 level. (This is done at NC retail because I have the numbers for it. Total system numbers would be proportionately larger, but the increase in fixed charges due to Harris is quite similar, almost exactly the same percentages. Discovery can obtain

all requisite data to put this on a total-system basis or any other basis found appropriate for computation of increased costs due to Harris units 1 and 2 and their effects on electricity demand.

The fixed charges on CP&L's present rate base comprise about 36% of NC retail electric revenues for the Company. Thus a 75% increase in fixed charges above present levels (Harris 1 added) means about a 27% increase in total charges to customers. A further 47.5% increase (Harris #2) in fixed charges above 1984-85 levels will raise total charges to customers at NC retail by about 17% more, for a total increase of 44% due to Harris. (These numbers are illustrative of the calculation that needs to be made in evidence for this contention when accepted.)

CP&L's estimate of the output of the Harris units is 5.5 billion KWH per year each (ER section 8, 70% DER capacity factor assumed). This is clearly too high, but using it for illustration, each Harris unit would add about 16% to CP&L's 1981 generation of about 32 billion KWH. (The generating capability of existing CP&L plants is about 37 billion KWH/year, plus about 3 billion KWH from Mayo 1, to be on-line in 1983 as now planned -- see CP&L FERC Form 1s at pp 431-432 for 1978, 1979, 1980 and 1981 -- a total capability from non-Harris plants of about 40 billion KWH.) Taking the lower figure of 32 billion KWH, each Harris unit at most will add about 17% to the system's generation of power.

Using Dr. Spann's estimate of -.7 for price elasticity of demand (industrial sales for textiles are actually decreasing since 1977 on CP&L's system, so his industrial value of .1 is not used, but rather -.5 for industry, -1.066 for commercial, and -.7 for residential, averaging on a weighted basis for sales right about -.70, which is considerably less than the values reported by Taylor), we have

that a 27% increase in ~~the~~ customer charges results in a demand for electricity (sales) of 1/(1.27)(0.7) times present sales, (all other factors the same) or about an 11% sales increase. However, this is about 3 billion KWH per year, which will be provided by the Mayo 1 plant already on-line before Harris 1 operates.

If you include Harris 1 and 2 in the cost increases, the resulting demand is 1/(1.44)(0.7) times the present sales, or nearly a 1% decrease in sales. As far as future demand is concerned, if all other factors affecting demand are the same with or without the Harris units, the effect of long-run elasticities of -0.7 is to cause additional power sales to vanish. Moreover, if more realistic long-run price elasticities such as -1.0 are used for Harris' plant cost effects on CP&L sales, the result is that sales would only be about 69% of what they otherwise would have been, due to Harris Units 1 and 2's increased costs reducing sales. This is again true with all other factors affecting electricity demand being equal or basically similar with or without the Harris units. There is no evidence that Harris will affect population, income, prices or supplies of alternate fuels, inflation weather, or conservation in such a way as to change this result significantly.

Using long-run elasticity of -1.0 (supported, e.g. by Profs. Blackburn and Weintraub as referenced above), then, CP&L sales will be about 69% of what they would have been without the Harris plants in the "long run", i.e. about 10 years, which is surely less than the Harris plants' estimated depreciation life of 25 years. The Harris plants at best will provide about a 35% rise in CP&L's generating capability for KWH (under very generaous assumptions as noted above re capacity factor and CP&L generation w/o Harris), and the sales reduction applied to the new generating capability of 1.35 times present gives sales of 1.35 x 0.69 or about 94% of

present, due to inclusion of the Harris plants. This calculation also assumes implicitly that the demand for the Harris plants' output (5.5 billion KWH/year each at CP&L's erroneously high estimate) would exist in the future, i.e. it assumes CP&L's sales forecasts are correct (in spite of massive evidence to the contrary, e.g. CP&L's own forecasts which keep being revised significantly downward & have dropped from 6.7% peak growth per year in 1977 to 2.9% per year in Dec. 1981 projections.) The point is that this contention does not in any way involve errors in CP&L's load forecast, but rather assumes that that forecast is correct and the output of the Harris plants will be fully needed unless the effects of price increases for electricity caused by the inclusion of Harris plant costs in rates are considered. Once those cost increases are considered, the market for the Harris plants' output vanishes.

It should be noted + is contended herein that making more realistic assumptions and calculating cost-benefit for only 2 units will make the costs far exceed the benefits. For example, the first 2 units, according to Table 8.2.1-1 page 8.2.1-3 are $1.453 billion and .634 billion in 1984 dollars, for a total of 2.087 billion 1984 dollars. (Realistic estimates as of 12-31-80 give $1.8 billion 1984 $ for unit 1 and $790 million 1984 $ for Unit 2, as noted in contentions 15 + 16 on unrealistic assumptions in the cost-benefit analysis, incorporated herein by reference, which gives a total cost for 2 units of $2.59 billion 1984 dollars). The lost "benefits" (power produced by units 3 and 4 under CP&L's overly generous 70% of design rating for lifetime unit capacity factor) total $3.505 billion by CP&L's own calculations. With Unit 2 on-line in 1989, the project life is still through the year 2014, or 30 years, so the change in the levelization period won't make much difference.

The result is that you lose about $3.5 billion 1984 dollars of benefits (power production), but you only save 1.234 billion (CP&L's plant cost est of 3.321 billion for 4 units, p.8.2.1-1, minus the cost of 2.087 billion at CP&L's ER estimate for units 1 and 2, source given above) in costs. This puts the project about $2.2 billion in the red at CP&L's estimates. If the 12/31/80 CP&L cost estimates for Harris Units 1 and 2 are used in 1984 dollars (source is CP&L E-100 sub 38 filing, Quarterly CWIP Progress Report as of 12/31/80, filed with NC Utilities Commission, Feb 1981 -- see also NCUC Docket E-100 sub 40 where this was made an exhibit) as above, you only save $731 million in costs by canning units 3 and 4, but you still lose about $3.5 billion from the benefits in power sales alone, putting the project nearly $3 billion in the red.

#15 Applicants' cost-benefit analysis in sections 8 and 11 of the Environmental Report (ER) is deficient and inaccurate, as detailed later. The use of outdated, incomplete and inaccurate information in this document filed with NRC leads to a question of why CP&L failed to use more up-to-date information available to it, e.g. the plant cost estimates filed with NC Utilities Commission pursuant to Docket E-100 sub 38 of that Commission (Quarterly CWIP Progress report of 12-31-80, filed Feb. 1981) similar estimates filed with FERC on Form 1 for 1980 at page 406, the fact that CWIP charges are in the NC rate base for the Harris units per NCUC Docket E-2 sub 391 decision in December, 1980 and are thus costs now being paid by NC ratepayers, and other material facts noted below. This contention's data and information will be incorporated by reference into contention 3 concerning whether CP&L's failure to use accurate, complete and up-to-date information to comply with federal law (NEPA) is a matter of incompetence, dishonesty, or both, and how such failures reflect on CP&L's ability to competently manage nuclear construction (and its record-keeping and material control and QA/QC), or an operating nuclear plant, and how truthful and forthcoming CP&L has been to NRC and to others about nuclear management, plant, design, construction, QA/QC and operating faults, deficiencies, violations and failures.

Partial detail of inaccuracies and deficiencies in CP&L's cost-benefit analysis follows below. Those known months prior to 12/18/81 docketing are asterisked -- by known, I mean CP&L had the information and had officially filed it with some other regulatory body, or got it from public records, orders, decisions etc. of such a body, or other publicly available information sources.

COSTS

Should include CWIP on; Harris portion of $213,792,000 allowed in
* NC retail rate base at a fixed charge rate of approx. 17.4% in NCUC Docket No. E-2 sub 391, Dec. 1980 decision of NCUC *
and Harris portion amounting to $309,747,000 of $392,199,000 of NC retail CWIP allowed in CP&L rate base in NCUC Docket E-2 sub 416, Decision notice Dec. 1981 (Order, Feb 12 '82, p. 25 from NCUC)
Future CWIP filings with NCUC, e.g. Harris portion of $500,000,000 (approx) applied for in NC retail base in NCUC Docket E-2 sub 444 in January 1982.

*Should include Harris unit #1 at actual cost estimate of $1,999,879,000 as stated in CP&L's NCUC E-100 sub 38 filing with NCUC Feb. 1981 * and adjust to 1984 dollars appropriately from Sept '85 inservice date. (At 8% per year, CP&L's cost escalation assumption, ER sec 8.2.1, Table 8.2.1-1 on page 8.2.1-2, items 1 and 5, this works out to a 1.25 year backward movement in time to average 1984 dollars, or dividing the 9/85 fiture of $1,999,879,000 by 1.1016 for a value in 1984 dollars of right at $1.8 billion. This is about $350 million more in 1984 dollars than the estimate shown on page 8.2.1-3 as the "Total Cost" of Unit 1, $1,435,523,000 which the Note immediately thereunder on that page states is "The total nominal dollars expended as of the in-service date were presentworthed to 1984".
* Should have used the 1984 present worth of the Shearon Harris unit 2 costs as stated in the above-referenced CWIP progress report to NCUC as of 12/31/80, adjusting that units 3/89 PW of $1,271,184,000 by the appropriate present worth factor (approsimately 0.7 for 4 3/4 years which brings the cost back to the 6/84 in-service date used for Unit 1 in these ~~[illegible]~~ FP calculations), leading to a result of about $890,000,000 in 1984 dollars rather than the $634,502,000 given (Table 8.2.1-1 continued)

* Should have included interest during construction at a higher inxterest rate than 8%. CP&L has stated in numerous rate filings with NCUC that it faces bond interest rates above 14% during 1980 and 1981. An 8% rate through 1984 including 14% in 1980 and 1981 would imply that construction interest would drop to about 2 to 3% per year in two of the years 1982-84, or that interest rates in those years will average about 4% to 5% per year, absurd conclusions which CP&L could not support if they had any financial sense at all.

*Should have included the construction or rental cost of the Harris visitors center in the costs, since its operation is included as an intangible benefit. Certainly the cost of providing a benefit should be in a cost-benefit analysis. Omission of this item suggests inconsistency on CP&L's part in comparing costs and benefits.

*Should have updated the Harris construction cost estimates to reflect costs of delay in Harris 2 to 1989 and cancellation of Harris Units 3 and 4, announced Dec.13 or thereabouts, 1981. CP&L obviously knew it was going to bring this action to the attention of its Board of Directors for action in December 1981 and could have prepared new cost estimates and provided them as a prompt amendment to the ER cost-benefit analysis -- unless we are to assume that the CP&L Board acted without considering the costs, which is hardly sound or prudent management.

Should have included in the cost-bxenefit analysis cost estimates for avoiding the construction of the units 1,2,3 and 4 by means of load management, energy efficiency, insulation, reflection and shading in lieu of air conditioning, etc. This is an obvious alternative that must be considered under NEPA (even with respect to completing units already under construction), as is clearly shown by CP&L's

choice to cancel units 3 and 4 of Harris in favor of load management and conservation programs. Failure to analyze an alternative actually chosen by Applicant CP&L (Applicant NCEMPA is forced to concur by its contracts with CP&L) is obviously a failure to properly use cost-benefit analysis under the National Environmental Policy Act. Failure to include costs for that alternative likewise violates NEPA.

(It should be noted here that NRC has attempted to exclude such alternatives by rule. NRC has, however, no authority to overrule NEPA. And the arbitrary and capricious nature of the rule change is obvious from the above -- Applicants are left free to consider and choose conservation and load management alternatives to nuclear construction if they (CP&L, or other utilities) so desire, but NRC attempts to bar its own Staff, Intervenors, Petitioners and the ASLBs from considering whether such alternatives can be preferable to construction. If such alternatives really do not apply, NRC should also adopt a rule prohibiting applicants from cancelling or deferring construction of nuclear plants without NRC approval where the reasons for the deferral or cancellation include no need for the power, or better and/or cheaper alternatives. In the event the Board chooses to exclude any part of my contentions under such NRC new rule, I hereby ask the Board to certify the question whether NRC can obviate NEPA and leave Applicants free to choose to take actions which cannot be considered as alternatives in NRC proceedings, e.g. cancelling or deferring nuclear plant construction in favor of alternatives like conservation and load management, for appeal to the ASLAB and the full Nuclear Regulatory Commission. The broad implications of such rule and exclusion for other licensing cases are obvious, as is the likelihood that nuclear construction may still be cancelled despite the rule, but only at Applicants' option, prejudicing the rights of other parties.

*Applicants' ER makes no mention of the costs of nuclear waste disposal as a cost in its cost-benefit analysis, though it does include such costs as a "benefit" in its calculation of per-kilowatt-hour charges to customers. (Table 8.2.1-2, page 8.2.1-4, line under "Fuel Cycle Costs" for "spent fuel storage/disposal"). Nuclear waste disposal costs should be included as costs, at more realistic figures than 1.2 mills/kwh

*Applicants' ER cost-benefit analysis does not include land removed from other use for use in permanent nuclear waste disposal from the Harris plant.

Applicants should use a higher number for nuclear waste disposal costs, for example, DOE's 1978 annual report V.3 p.220 number is 1978$ 1.33 (1984$ equivalent is over 2.1 mills/KWH) mills/KWH (see ref. in Komanoff, Power Propaganda, p. 10 footnote 5) and include the amount as a cost Applicants cost-benefit analysis assigns no value to the lives lost in uranium mining, nuclear fuel cycle otherwise, radon emissions from nuclear fuel cycle, nuclear plant operations and accidents, and nuclear transport accidents and nuclear fuel disposal. Indeed, these lost lives are not mentioned, nor are any numbers given as to how many persons are expected to be killed or injured by the effects of the Harris plant, its fuel mining and processing, tailings disposal from uranium mills, radon, mill tailings accidents, etc. over the 11 million years it will take the nuclear fuel to decay to the same radiotoxicity as its parent ore, once it has been used in the Harris reactors (ref. Prof. B.L. Cohen, for 11 million year number — See Addenda to Contentions per index)

Since these health effects will continue for at least this long -- as excess deaths due to the existence of the nuclear fuel cycle for the Harris plant, which would not exist absent its operation , they must be included as costs in the cost-benefit analysis, and as intagngible factors (which should also include genetic damage) or the long run.

Applicants should have used more accurate data on the health effects of radioactive emissions, short and long-term, e.g. those provided by John W. Gofman (Radiation and Human Health, 1981, see, e.g.Chapter 8, pp 266-288 & Tables 19-22; Chapters 9,10,11; Chapter 12 on internal Emitters pp 417-428, re beta emitters 417-18, alpha-emitters 419, gamma emitters 420-423, tritium pp 425-428; Chapter 13 on Radon daughters, pp429-468 in its entirety; Chapters 14,15,16 on plutonium hazards; Chapter 17 pp 521-554, Table 53 on p.551; Chapter 20 on induction of leukemia by ionizing radiation, Chapters 21-22 on congenital and genetic effects of ionizing radiation (pp 707-853). I really can't summarize out the most important parts of this detailed book much better than this -- the entire book is relevant to cost-benefit analysis and radiation effects); Franke et al (NRC translation 520) (see figs 1 to 5, tables 1 thru 6) showing that AEC/NRC tables underestimate uptake of radioactive material in the environment by factors from 10 to 10,000 times due to fraudulent research conducted by AEC for political purposes to minimize the perceived dangers of nuclear weapons fallout; K.Z. Morgan and J. Rotblat, bulletin of the Atomic Scientists,

); cost estimates for radioiodine releases in a nuclear emergency by L.R. Solon and K. Rosenberg, Bull At Sci October 1981 pp54-56 which are $10 billion 1979 dollars ($9,991,000,000) for outpatient treatment and followup following an accident releasing 10 rem/person of I-131 and I-133 to the thyroids of 8million persons. This is a cost of $125/person-rem to the thyroid; the 1000000 person-rem per year of "technologically enhanced" radiation dose to the public, principally from uranium mining, found by the Interagency Task Force on Ionizing Radiation for the year 1978 (ref. Low-Level Radiation, Just How Bad Is It? Science, p.168(?), 1979 by Jean L. Marx, where the IATF also gives 56,000 person-rem from the 50 GWe of nuclear power then in place, per year, at 170 (copy attached)

Costs cont.

*Applicants improperly exclude the cost of the 230 kV power lines from Harris site, e.g. Harris-Asheboro, Harris-Fayetteville, Harris-Cary Sw. Harris-Erwin South, from cost analysis for the plant

*Applicants improperly exclude the cost of the following 500 kV power lines from Harris site, Harris-Harnett and Wake-Harris.

*Applicants underestimate the 1984 dollar cost of the Harris to other points transmission lines, in that the right-of-way costs in 1985 (E-100 sub 38 filing as of 12/31/81) exceed $14 million. The lines themselves, of course, will cost something. And those costs should also be included,

dividuals may have died of causes other than cancer before their malignancies became apparent. Other work has shown that people who are developing cancer, especially leukemia, which was the first cancer to develop in excess among the atom-bomb survivors, are more susceptible to other causes of death. No evidence suggesting an increased death rate from causes other than cancer in the atom-bomb survivors has turned up, however.

Stewart also suggests a reason why leukemias were so prominent among the atom-bomb survivors and not among the Hanford workers. Atom-bomb blasts produce a lot of radioactive dust that may be inhaled and ingested. Thus, Stewart thinks that the leukemias, which developed early in the survivors, may have resulted from such internal radiation, whereas the solid tumors, which developed later, may have resulted from the external radiation. The Hanford workers have not been exposed to radioactive dust the way the atom-bomb survivors were.

Another indication that low-level radiation encountered on the job may cau cancer comes from a preliminary stud of the causes of death of men who worked at the Portsmouth Naval Shipyard where nuclear submarines have been repaired and refueled since 1959. The study, which was carried out by Thomas Najarian, a physician who was then at the Boston University School of Medicine, Theodore Colton of Dartmouth Medical School, and a group of reporters from the Boston *Globe*, suggested that there was an excess of cancer deaths among shipyard workers who had contact

The Sources of Ionizing Radiation

Natural sources account for much—about 50 percent—of the radiation to which the general population of the United States is exposed, according to the Environmental Protection Agency. Little or nothing can be done to minimize exposure to this natural background radiation, roughly one-third of which is in the form of cosmic rays coming in from outer space. The remainder originates in sources such as deposits of minerals, including uranium and phosphate ores, that contain radioactive components. Some of the radioactivity may turn up in common building materials, granite and brick, for example, or may make its way into our air, water, and food supplies. But the average exposure to an individual from natural radiation sources is very low, a total dose of about 0.1 to 0.2 rem per year.

Medical and dental procedures constitute the next largest radiation source; they contribute about 40 percent of the total exposure of the general population. Most of this comes from the use of diagnostic and therapeutic x-rays, with the remainder attributed to the use of radiopharmaceuticals. Radiopharmaceuticals concentrate in specific organs and give physicians information about the clinical condition of those organs.

Medical and dental radiation is the largest block of radiation subject to human control. Although its use is generally considered to provide benefits that outweigh the risks, Health, Education, and Welfare Secretary Joseph A. Califano has recently directed the Food and Drug Administration to accelerate its program to reduce unnecessary exposures to medical and dental radiation in order to minimize the risks as much as possible.

Radioactive fallout from nuclear weapons tests is the third largest source of radiation exposures, but it represents only about 3 percent of the total. Most of the fallout produced by U.S. weapons occurred between 1945 and 1962 when the testing was carried out in the atmosphere. Since the Atmospheric Test Ban Treaty of 1963 went into effect, the United States and the Soviet Union have tested their weapons underground. These tests have released little fallout into the atmosphere. But some of the radioactive materials in fallout, including strontium-90 and plutonium isotopes, are extremely long-lived. Materials released from the atmospheric tests are still present in the environment and in our bodies. Moreover, some countries, notably China and India, still occasionally conduct weapons tests in the atmosphere. The doses of radiation received from fallout vary with geographical location. People living immediately downwind from the test sites usually get the largest doses, but weather patterns can carry the radioactive materials for long distances and they are now spread over the entire globe.

Although the average exposures of the general U.S. population from natural radiation sources are very small, human activities can greatly increase the exposures of specific groups of people. The activities include the mining and processing of ores, uranium oxide, for example. Miners and other workers carrying out these activities and people living near the mines and processing plants are exposed to higher radiation doses than the general population. This "technologically enhanced natural radiation" accounts for about 2.5 percent of the total human exposure in this country.

Another source of radiation exposure is the use of nuclear energy to produce electricity. Most of this exposure is concentrated in the workers producing the nuclear fuels and running the power plants. People living near such facilities are exposed to lesser doses.

Finally, some consumer products emit very low levels of radiation. They include luminescent clock or watch dials containing radium, some kinds of smoke detectors, color televisions, and the glass used for making eyeglasses.

—J.L.M.

1978 Estimates of the radiation exposures of the U.S. general population. [Data on radiation exposures as summarized by the Interagency Task Force on Ionizing Radiation]

Source	Person-rems* per year (in thousands)
Natural background	20,000
Healing arts	17,000
Technologically enhanced	1,000
Nuclear weapons	1,000 to 1,600
Fallout	0.165
Development, testing, and production	56
Nuclear energy	6
Consumer products	

* "Person-rems" are calculated by multiplying the total number of people exposed by their average individual doses in rems.

*Applicants' ER fails to consider the question of whether the full power output of the SHNPP will be saleable.

*Applicants' ER assumes a 70% DER capacity factor for the full lifetime of the units, ignoring the fact that no large Westinghouse PWR had (as of 12/31/80) ever achieved such a lifetime capacity factor to date (large PWRs being 700 MW and over, CP&L's turnkey unit Robinson 2 having the highest lifetime DER CF at 66.5% as of that date)

*Applicants' ER ignores the effect of steam generator leaks and repairs and replacement, ~~and the radioactive waste disposal impact thereof~~ on the plants' electrical output. These effects are large and negative as shown by the record of such plants as Surry 1 and 2, & Turkey Point 3 which have had to have steam generators replaced, ~~and 4,~~ and the recent (winter 1981-82) experience of Duke Power Company's Oconee 1,2 and 3 units (combined CF 29.98% for all 3, 4 mos ending 3/31/82 NCUC RS-46 Report 4/21/82 page 7) and the problems CP&L's Robinson 2 unit had in summer 1981, resulting in a limit of 50% power level until this winter, and a limit of 75% power level at present, imposed by CP&L.

The 12.31.81 lifetime DER CFs (capacity factors) of the above units are as follows (NUREG 0020, Vol 6, No.1 of Jan 1982, latest one I have and I subscribe to NRC's document service to get it):

Oconee 1	56.8%	(38.6 for the year 1981)	
2	60.3%	(66.8, ditto)	
3	64.6%	(72.5, ditto	
Robinson 2	65.6%	(57.1, ditto	--scheduled steam gen. replacement, 1985
Surry 1	51.4%	(34.2, ditto	Surry 1, 2 and TP 3 include Steam generator replacement
2	53.3%	(74.1, ditto	
Turkey Point 3	59.5	(15.0, "	
4	64.8	(74.2, ")	

Applicants' ER ignores the effect of steam generator design problems of Westinghouse model D steam generators, e.g. at V.C. Summer nuclear plant (very similar to Harris according to Harris FSAR), Duke Power McGuire units 1 & 2 (McGuire now limited to 50% power by NRC staff order -- Harris has Westinghouse model D steam generators too and therefore can be expected to produce less power due to the inferior

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16 Applicants' Cost Benefit Analysis (given only for 4 units at SHNPP, in Section 11.0 of the Environmental Report (ER) at pages 11.0-1 and 11.0-2 and detailed more fully in ER section 8., shows that by CP&L's own figures and assumptions, the costs of the SHNPP (as quantified in dollars, including wages and salaries) exceed the benefits when the plant benefits are assumed over the same period as the costs are calculated, as shown below. Therefore, under the National Environmental Policay Act (NEPA) construction should be halted immediately so that no more money will be wasted on an uneconomic project which by the calculations of its principal owner has flunked the main test of a cost benefit analysis as required under NEPA. Moreover, as shown further below, the cost-benefit net loss of SHNPP operation with 2 units is ~$2 billion 1984 dollars — more than has been spent to date. Construction must must halt so so we more do money is not lose more money.

(until Amendment 2 to ER become available 5-10-82 to me, See "Further Definitions" near end of this Supplement)

According to CP&L (ER, Sec.8, Sec. 11)
All figures in 1984 dollars
*Asterisked are converted to 1984 $ @8%/yr escalation rate which CP&L gives in Table 8.2.1-1 of ER, lines 1 and 5

COSTS	BENEFITS
$3.405 billion-*Plant, switchyard &trans lines, ER 8.2.1-1	Power $22.08x10^9$ KWH/yr p.8.1-5 $280M/yr 1984 $ 25 yrs (p.8.2.1-1) $ 7.010 billion
3.967 billion -fuel ER 8.2.1-1	
1.360 billion *other O&M ER 8.2.1-1	Construction Payroll &Induced Spending (8.1-2) 0.966 billion
Decommissioning, $42.1 to 51.8 million per unit, 1978 $, ER section 5.8	Operating Payroll &Induced Spending (p.8.1-2) $0.753 billion
* .329 billion *PW'd to 1984 $ at 8%/yr, 1.59x Higher number used since higher number also used in tax estimates, see p. 8.1-6 of ER, 8.1-2 This is also the cost of method now planned, see NCUC Docket E2 sub 416 where CP&L put these costs into NC rates.	Taxes 1981-90 0.092 billion * * (PW at 8% to 1984 of 97.5 million over 10 yrs 1981-90) p.8.1-6,8.1-2 Taxes 1991-2016 0.191 billion* *(PW to 1984 of 25-yr series of uniform payments $31 million each) p.8.1-2, 8.1-6
$ 9.061 billion TOTAL COSTS	TOTAL BENEFITS 9.012 billion $

Of course, the construction and operating payrolls will be less since units 3 and 4 aren't going to be built. Taxes will be less since Units 3 and 4 aren't there to be taxed. Fuel costs will also be less, as will other O&M, but since most of the savings by not incurring these costs occur out in the last 27 years of the period, less than half of the 1984 dollar value of these items can be saved by canning units 3 and 4. Specifically, the present worth factor for all these costs is about 68% (moving the costs back from 1989 to 1984 at 8% per year escalation rate or time value of money). The result is you only save 68% x 50%, or 34% of the fuel and O&M costs in 1984 dollars. The same factor should apply to ~~construction payroll and~~ taxes 1981-90 operating payroll costs, and a similar one to construction payroll. On taxes 1991-2016, you save 50% since these were present-worthed to 1984 dollars for all 4 units equally. Likewise for decommissioning costs. Ditto for switchyard & lines.

The result of all this, at CP&L's assumptions:

COSTS	1984 dollars	BENEFITS	
$2.59 billion	Units 1 and 2	Power (70%DER CF)	3.505 billion
.042 billion	switchyard & lines (1/2 cost)	Constr Payroll &induced effects	0.038 billion
2.957 billion	fuel	Opy Payroll & induced spending	0.497 billion
0.898 billion	O&M other than fuel	Taxes 1981-90	0.060 billion
0.164	decommissioning	Taxes 1991-2016	0.096 billion
6.651 billion	TOTAL COST	TOTAL BENEFITS	4.796 billion

excess of cost over benefits, approx $2 billion

This is more than the present excess of costs over benefits, Ergo Construction must cease

Correction for the omissions and errors not included here but put into contention 15 and incorporated herein by reference will simply tilt this balance even further into the red. Therefore the Harris project fails the basic NEPA cost-benefit test in the light of new information (cancellation of units 3 and 4, and the correcting of numbers, factors and errors incorporated herein by reference) per the Calvert Cliffs decision 449 F2d 1109 at 1128.

Now as it will only tip the balance further in the red, as would operation of SHNPP

17 The EP, ES and ~~XRP~~ other analyses and documents herein are deficient in not taking into account the fact that, in constant dollars, the cost of Harris Unit 1, and Unit 2 even more, will continue to rise as shown, e.g. by C. Komanoff, POWER PLANT ~~XXX~~ COST ESCALATION (1981) as summarized in~~xxx~~ sections 1.1 (3,4,6), 1.2, 1.3 and section 2 (Chapter 2) therein). Taking such constant-dollar cost escalation into account will tip the NEPA benefit-cost balance further against SHNPP on the basis of the new data and analysis in the work of Komanoff and other nuclear plant cost analysts. This cost escalation also increases the likelihood that Unit 2 will be cancelled, therefore this contention is incorporated by reference into contention 20 re the likelihood of cancellation of Unit 2 and consideration of that likelihood under NEPA.

18 The ER, ES and Applicants' filings improperly exclude the costs of repairs, modifications, disposal of nuclear waste including worn-out steam generators, lost power production due to power restrictions, and the enviro. and social-economic impacts under NEPA or radiation exposure to steam generator inspection, modification, repair and replacement personnel, disposal as radioactive waste of steam generators worn out or unusable before end of SHNPP's operating life as Applicants project it, whether in fact such disposal will be allowed, and if not, the enviro. impact of long~~x~~term storage of the radioactive steam generators on site, and other effects and issues resulting from the defective design of the Westinghouse model D steam generators (Gec. Maxwell of NRC says they are D4's--FSAR doesn't say in so far as I can find) at SHNPP with similar vibration & flow problems to S.G.'s at McGuire, VC Summer, Ringhals, Almaraz, etc. and corrosion problems

in view of the facts (a) that since SHNPP is not yet operating, the option of removing, replacing, redesigning or repairing the steam generators (S.G.'s) in it in order to avoid said vibration, corrosion and other design problems, e.g. by retubing the steam generators with tubes less subject to corrosion, e.g. stainless steel tubes; other measures to reduce vibration, corrosion, cracking, pitting etc of tubes including heavier wall thickness in new tubes installed; etc. have not been considered and compared to using the defective S.G.'s in place (b) the consequences of a long-term limit to 50% power operation are not factored into the NEPA cost-benefit balance yet McGuire, built & run by Duke Power Co. a more competent utility than CP&L, is still under such a limit thru July 4, 1982 & continuing; the consequences of a required shutdown to modify or replace said S.G.'s with defects like those at Mcguire's S.G.'s or a shutdown required for safety consequences of deterioration of SHNPP S.G.'s from corrosion, vibration, sheet buckling, failure of internal supports or tubes, pitting, denting and accumulation of deposits inside the tubes, massive deterioration of S.G. tubes during shutdown or otherwise (e.g. as at TMI-1) have not been or are inadequately considered in the cost benefit balance under NEPA.

19 The FSAR, SER, ACRS report O.L. stage and other documents re SHNPP safety & health effects & accidents are deficient in not adequately addressing the impact of S.G. tube vibration, extremely rapid corrosion or reduction in SG tube integrity as 1 tube losing 20% of thickness in 24 hr at McGuire corrosion, and other causes and potential causes of failure, e.g. as listed in the contention immediately above, on the integrity of the primary coolant boundary during overpressure and overheating transients (e.g. ATWS, reactor trip), on the release of radioactivity in a LOCA caused or compounded by multiple failures in the S.G. tubes or tube sheets, and on the ability of ECCS and RHR to cool the core with massive leaks in one or more steam generators

20 It is likely that Shearon Harris Unit 2 will not be completed, considering (a) the cancellation in December 1981 of Harris Units 3 and 4 by CP&L in favor of load management and conservation according to CP&L (b) NRC's own estimate delivered to Congress that Unit 2 would not be built (referenced by Environmental Law Project, Applicants and NRC Staff already in this docket) (c) CP&L's continuing difficulties in raising the necessary capital for construction of power plants as shown by CP&L testimony in,e.g., NCUC Dockets E-2 sub 391 (1979-80), E-2 sub 416 (1981) and E-2 sub 444 (1982), particularly the testimony of S.H. Smith (President and later also Chairman), VP Lilly, and others -- particularly noteworthy in this regard is the fact that before Harris 3 and 4 were cancelled, CP&L maintained in Docket E-2 sub 416 that the Company would need $6 billion in the next 10 years to finance new construction (1981), see Application E-2 sub 416 and testimony as referred to above. In Docket E-2 sub 444, filed early in 1982 just after the CP&L company cancelled Harris units 3 and 4, the Company again states (Application, p.5 Item 12) that $6 billion will still be required over the next ten years for new construction. In other words, cancelling Harris 3 and 4 left CP&L in just as much financial difficulty early in 1982 as they were in in 1981 before cancelling those units, according to CP&L. (In the same item (12) of the E2/444 Application, CP&L gives its peak demand growth rate as 2.9% per year.) THIS IS PART OF (e)

(d) there exists a substantial surplus of base load generating capability on the CP&L system with total busbar costs well below those of Harris 2 -- see, e.g. Eddleman testimony prefiled in NCUC Docket No. E-100 sub 40, 1981 (Exhibit Eddleman Report in the record)

(e) CP&L's load forecasts have dropped from 6.7% per year growth in peak demand (1977 -- see Spann testimony before ASLB in this docket for CP&L, Tr. 1729 and following) to 2.9% per year as estimated in December 1981 by CP&L. There is every likelihood that

Applicants' load forecasts will continue to decline at a similar rate, for none of the conditions affecting the decline, such as rising electricity costs, increasing use of conservation and load management techniques, increased efficienty in the use of electricity, substitution of alternative fuels including wood, wind, hydroelectric and solar energy for purchased electricity from CP&L, increasing co-generation of electricity by industry, etc, shows any sign of abating in the CP&L service area, much less of changing so as to affect the downward trend of load forecasts significantly.

(f) There are already feasible on the CP&L system additional conservation and load management options the Company has not put into effect which would, at a cost of less than $1 billion, remove from CP&L loads more than twice the peak output of Harris unit 2, and more than twice its estimated generation at 70% DER capacity factor (ER sec. 8, e.g.). See Eddleman testimony in Docket no. E-2 sub 416 and Docket E-44 before NCUC in 1981 for details; that testimony and table 6 is incorporated herein by reference to detail the options and their likely savings. CP&L did not cross-examine this testimony even though I was recognized as an expert in energy conservation and in energy systems.

(G) In the light of the above information, and other information I believe CP&L is concealing concerning plans to cancel Unit 2, which can be developed on discovery, e.g. hiring consultants re cancelling units 2,3 and 4 in summer 1979 or near that time, internal memoranda, etc., the ER and cost-benefit analysis is deficient under NEPA and 10 CFR 51.21 in not taking into account the likelihood of cancellation of Harris Unit 2 at CP&L's option, and the costs and benefits of the project without Unit 2. The data on Unit 1 cost, coupled with the data on benefits filed by CP&L in its DF as corrected per contentions 15 and 16 incorporated here by reference, it

is clear that consideration of the likelihood of cancelling Unit 2 by CP&L's choice also tilts the cost-benefit balance of the Harris project further into the red. In the light of the cancellation of Harris 3 and 4, and of other units such as WPPSS 4 and 5 which were much farther along in construction (approx 25 and 35% complete, I believe) than Harris 2, the cancellation of CP&L's South River nuclear units in 1978, the cancellation of Duke Power's entire 3-reactor Perkins project early in 1982, the cancellation of Surry 3 and 4 and of North Anna 4 by VEPCO, etc., it must be clear that nuclear units which are the last ones to be built according to the utility's current construction schedule are particularly vulnerable to cancellation here in the VACAR subregion of SERC. The extensive nuclear deferrals and cancellations by TVA in 1980-82 are further evidence of this fact. This is all information available now & changed from the CP FES hearing that cannot be ignored in an operating license ER, EIS, ES or cost-benefit analysis under NEPA and Calvert Cliffs. Refusal to consider the likelihood and consequences of CP&L's cancelling Harris 2 will be a fatal defect in any cost-benefit analysis of the harris plant because Unit 1 has a cost in 1984 dollars of about $1.8 billion* versus about half that for unit 2.* Cancel unit 2 and you save only 1/3 the construction costs, but you lose half the benefits (electric power and operating salaries and taxes) in essence. Thus any likelihood that unit 2 may be cancelled by CP&L weighs further against the SHNPP project in cost-benefit analysis properly conducted under NEPA and 10 cFR 51.21.

* see "Further definitions ..." (contention 22 D, p.86+) per index toward end of this supplement for confirmation of this per CP&L's ER Amendment 2, first available to me 5-10-82.

21 If Harris plant construction were terminated immediately or as soon as practical, this action would enable CP&L to conserve electricity in that if the sunk cost of the Harris construction to date (about $1.3 billion) (Exh. II p.1, 12.31.81 CP&L CWIP progress report to NCUC, Feb '82) were passed on to customers in rates, demand for electricity would thereby be reduced significantly over the amortization period due to price elasticity of electricity demand. (The data on price elasticity from contention 14 is incorporated herein by reference for specificity as to the sources & general availability of such evidence.)

Since using CP&L's data (contentions 15+16 thereon is incorporated herein by reference for its informational content) the Harris plant with only 2 units has a net cost-benefit value of about minus $1.8 billion (excess of costs over benefits at CP&L's assumptions), and correction of the errors in CP&L's cost-benefit analysis under NEPA and Calvert Cliffs would make this figure even larger negative, it is clearly in the public interest to stop construction now, thus limiting the losses to the public at large and to the Company CP&L.

This contention, however, focuses on the electric energy conservation benefits of terminating Harris plant construction. Amortization of the Harris 3 and 4 units is now being sought by CP&L from its retail customers in NC (NCUC Docket E-2 sub 444, prefiled testimony and Application) over a 10 year period with the balance carried at CP&L's fixed charge rate in terms of charges to customers (i.e. earning after taxes at the Company's overall fair rate of return). This fixed charge rate is now about 20.0% as can be calculated from the NCUC Order in E-2 sub 416, Final Order Feb 12, 1982. Amortization over 10 years at 20% carrying charge results in an annual charge to ratepayers of about 23.85% of the original amount ($1.3 billion), or about $300 million per year on a total system basis. About .7 of this is NC retail, or $210 million per year increased charges to customers.

CP&L states in its Environmental Report, Section 1, that it considers price increases a means of causing energy conservation. Indeed, it's the first one CP&L mentions. (See also the FPC form appended to section 1.0 of the ER). Since CP&L believes that price increases help conserve energy, it is wholly appropriate to consider the energy conservation effects of price increases resulting from Harris plant cancellation (assuming those costs are charged through to ratepayers as CP&L desires, see E-2 sub 444 referenced above). The conservation benefits from plant cancellation can be had at less cost than the conservation benefits from ~~xxxxxxxxxx~~ the electricity price increases from constructing and operating the Harris units 1 and 2.

To illustrate the calculation that needs to be made in evidence under this contention, the effect of the price increases from cancelling Harris 1 and 2 is about 20% over 10 years (NC base retail revenues $1 billion, 1981, for CP&L, approximately~~$~~, with amortization costs $210 million per year as derived above). The result is a ~~xxx~~ .20 x-0.2 or ~~2~~4% reduction approximately in electricity sales in the short run, and a 14% to 20% reduction in sales in the long run (long run elasticities -.7 to -1.0 approximately, CP&L's and Blackburn-Weintraub ~~xxx~~ evidance respectively). Now, the benefits can be readily calculated as the fuel saved by these reductions in sales (plus savings in variable O&M). ~~T~~The fuel saved will be either oil or coal. Coal costs less, about 1.9 cents/KWH for CP&L at present (Jan 1982 F&O report to NCUC, p.20 line 52, using heat rate from FERC form 1 for 1980, 10,170 BTU/KWH), so taking the savings at 4% of total generation the first year, steady at 4% through 1985, then rising linearly to 20% in 1990, and assuming the price of coal in constant dollars does not decrease, the savings would be .64 x 1.9 cents x 32 billion KWH (CP&L gen. 1980 & 81) or about $389.5 million present-day dollars, reducing the cancellation loss's present worth to only about $900 million.

cumulative % savings (added over all years: 4% × 4 yrs + 7.2% × 1 yr etc = 64% × 1 yr generation over the years 1982-90

#22 In addition to the cost-benefit errors alleged, deficiencies and mistakes and incomplete reports to be corrected as set forth in other contentions herein, #s 15,16,17,18 incorporated by reference herein & 19 & 20 ABC & G the following contention in addition is set forth with respect to the costs and benefits of the Harris Project Units 1 and 2, reflecting ER amendment 2 which filed late Mar '82 first became available at the Wake County LPDR on 10 May 1982 (after that LPDR was closed to the public, myself included, May 3-9 1982, as alluded to in my previous requests for extension of time to the Board):

(A) CP&L's Amendment 2 fuel cost estimates in Table 8.2.1-2 as amended are erroneously low, as are the fuel cost lifetime estimates in section 8.2 as amended and section 11 as amended (all in the ER).

(B) CP&L's estimates in the amended section 8 of the ER that the payroll at the Harris plant and the construction payroll for it based on only 2 units will not be decreased by any significant amount, compared to the construction and operation of all 4 units at the site, is not accurate. Its credibility could qualify them for a Section 8. Either the estimates filed December 18, 1981 with the original ER (O.L. Stage) on these matters, or the ones filed in Amendment 2, or both are in error, raising questions of CP&L's competence, accuracy and good faith that bear on management capability, as well as matters that need to be corrected in the ES and heard before the Board to achieve a proper balancing of costs and benefits (the Board should hear (A) above and the other items below for the same reason).

(C) At Table 8.1.1-1, as amended, CP&L computes the ~~xxxx~~ benefits of power production from the Harris plant in 1984 dollars to be $280,387,000 for 5.5 billion KWH (based on 70% Capacity Factor DER). This is 5.1 cents/KWH (1984 $). Yet at Table

8.2.1-2, CP&L computes the cost of power production from Harris, levelized 1985-2013, as 78.58 mills per KWH. This is 7.858 cents per KWH. This latter estimate includes questionably low fuel cost estimates (compare the original EP calculation, over 32 as opposed to 29 years, giving a much higher figure for fuel cycle costs), and erroneously high Capacity Factor estimates (&70% DER) as well as assuming that each unit will operate 25 years when in fact embrittlement of the reactor vessel (raised reference temperature for nil-ductility), rising levels of radioactivity in the reactor piping that make repairs impractical from a radiological standpoint (e.g. as at Dresden 1, shut down early 1978, possibly repairable by untested solvent flush by 1986), or other safety or maintenance problems such as embrittled cables for power, instrumentation and controls, computer failure (ICS) or other problems can and will adversely affect the Harris plants' service life, holding it below 25 years for any unit. A realistic estimate on these points would show the cost of power generation exceeding the benefits, when all costs including that of nuclear waste disposal (high and low-level) are taken into account.

(D) CP&L's 1985 dollar cost estimates for Harris Units 1 and 2 (which were in 1984 dollars) essentially confirm mine in the other contention(s) on cost benefit, which were made without knowledge of this amendment #2 which contains same.

(E) Taking into account Amendment #2 to the ER and corrections required by this and other contentions concerning costs and benefits, the net present value of Harris costs still exceeds the net present value of all benefits from it by about $2 billion. Therefore construction should terminate as soon as possible to preclude further losses, the present investment being a lesser loss.

23A Benefits and costs of Harris under NTPA, the ER and the ES have not been properly calculated in that Table 1.3-1 of the ER, at ~~Xxxxx~~ Page 1.3-3, shows that a 3-year delay in both Harris units, on the basis of CP&L's most current load forecast, results in a 32.1% reserve (far above the 20% needed) in 1992 (and using CP&L's forecast, one can calculate that reserves would then remain above 20% until 1995 or later -- see, e.g. CP&L R8-43 filing with NCUC, Mar 31, 1982 at Table 1, right col.)

Further, the fact that companies such as APCO have been selling bulk power to VACAR members contradicts CP&L's claim (ER 1.3) that such power will not be available to make up for any lack of CP&L reserves in the intervening years. Purchased power will cost less than SHNPP's 8 cent/KWH at busbar output. Table 1.3-2, e.g., shows VACAR reserves at 20.0% of higher through 1992 with both Harris units delayed 3 years, and at 19.2% or higher (not significantly below 20%) through 1989 if all 4 SHNPP units were cancelled (or "indefinitely postponed"

On the basis of the most current information, such as the above, the "benefits" (i.e. power output) of the Harris plant are not needed for at least 3 years after construction on the current schedule, and thus a correct calculation of costs and benefits would discount the benefits by 3 years at 8% to 10% (discount rates used by CP&L in the ER, e.g. 9.5% escalation on Harris construct'on costs), resulting in a discount of 20% to 25% in the benefits in 1985 dollars (or other constant dollars) since the ratepayers begin to pay the costs fully, 3 years before the plant is needed for VACAR or CP&L by their estimates (best current estimates).

When this error is accounted for, the NEPA cost-benefit balance is even more against Harris operation. It is important to note that this contention does not involve any allegation of load forecast error, but adopt's CP&L's forecast as current information from the ER under 10 CFR 51.31. Calvert Cliffs, Footnote, etc

in "further definitions" p. ... cited below

23B General statement applicable to this + all other contentions re cost-benefit and the Environmental report: The Applicants' ER and cost-benefit analysis fail to comply with 10 CFR 51.21 in that it does not discuss the extent to which the same matters ~~discussed~~ described in section 51.20 (CP stage environmental report) differ now, nor does it discuss accurately and up-to-date the new information which is now available as to costs, benefits, environmental effects and other matters in the cost-benefit analysis and ER in addition to that discussed in the FEIS for the Harris plant (dating from 1974) in connection with the construction permit, specifically the biological monitoring, seismological monitoring, meteorological monitoring, aquatic and wildlife monitoring, radiation monitoring, plant construction costs, fuel costs, nuclear waste disposal costs and land required, radiation exposure to employees (e.g. from steam generator inspection and repair) and contractor employees, new information showing increased risks from radiation and ingestion of radioactive material, e.g. NRC translation 520, NRC translation 161, Gofman, Radiation and Human Health, 1981; Mancuso-Stewart-Kneale studies of low-level radiation (1979-80), opinion of Dr. Radford, Chairman of BEIR Committee re reducing occupational radiation exposure limit to 500 mrem/year per person, costs of emergency and evacuation planning and training imposed on other communities, costs of leasing, building and operating the Harris Visitors Center, more accurate data on actual nuclear capacity factors from Westinghouse PWRs, e.g. as shown in NUREG 0020, Vol 6 #1; actual costs of power lines being built to and from Harris site, and new estimates therefore, including land costs, as shown in CP&L E-100 sub 30 filing with NCUC, as of 12.31.81; plant costs as shown in that same filing; etc. as detailed in other contentions 20, 15, 16, 22, 17, 18, 19 incorporated by reference herein, and that the ER, FEIS, and SER (the last 2 not existing yet) fail to accurately take these matters listed herein ~~incorporated herein~~ into account.

#24 Shipments of ~~fuel~~ spent nuclear fuel to SHNPP from Robinson and Brunswick nuclear plants, which Applicants have requested the necessary licenses to do, is inimical to the common defense and national security in that such shipments provide an excessive number of tempting targets for terrorists using armor-piercing mortar and cannon (20mm and up) shells, precision-guided munitions and guided and unguided antitank weapons (including armor-piercing ones, TOW missiles etc), high explosives including plastic explosives and/or shaped charges that could be attached to a cask once it had been immobilized, e.g. by machine-gunning (or with rifle or semiautomatic rifle fire or shotgun fire) the cab, tires, radiator, driver(s), guard(s) on the waste shipment if by truck, or by blowing up a stretch of rail or loosening a rail to cause a derailment (or by using disabling gases, poison gases, or hallucinogens on drivers, guards, truck or train personnel) and also doing any of the above acts to gain access to the waste (spent fuel) container and by doing any or any combination or all of the above acts, which are well within the capability of small groups or terrorists comprising only a handful or individuals (as few as 1 or 2 could use many of these means), breaching the spent fuel container and releasing radioactive material to the atmosphere, water of rivers and streams, and ground surrounding the location of the spent fuel container, endangering the health and safety of the public, harming same, and radioactively contaminating major highways or rail lines in eastern NC and in South Carolina. Applicants' security plan is inadequate to prevent the above scenarios or one of them from occurring.

~~An alternative situation and risk not considered~~

#25 (The description of how terrorists can breach a spent fuel shipment and harm the public health and safety thereby, from the contention 24 above, is incorporated herein by reference.)

An alternative of less environmental impact than spent fuel shipments from Robinson and Brunswick to Harris needs to be considered, both because of NEPA and because of the unwarranted risks of terrorist activity posed by such shipments which provide numerous almost indefensible targets over long routes and a long period of time for multiple spent fuel sshipments.

Such alternatives include re-racking of spent fuel (including the use of poison rods made proof against breakage) spent fuel consolidation (with appropriate measures against accidental criticality, for all alternatives herein), and/or expansion of on-site spent fuel pools at Brunswick and Robinson and any other reactor from which spent fuel might be shipped to the Harris site. A further alternative for Both Harris and the other plants referred to above is to store all waste (spent fuel) on site for the operating life of the plant, and then put it all on one, extremely well-guarded and completely unpublicized) unit train for shipment to a final repository, if one exists then. This alternative as suggested by Dr. Marvin Resnikoff of CEP and others had the advantages of letting the spent fuel's heat and radioactivity decay, over a period of many years for most such spent fuel, resulting in less risk to the public from either terrorism or accidents in transporting the fuel both for the reason of less radioactivity in the spent fuel and because one unit train is less subject to accident or terrorist attack than a large number of train shipments or truck shipments.

NEPA requires that such alternatives be fully considered in the ES. They are not, at least not accurately. And the ER discussion of spent fuel transport is wholly inadequate in that it does not consider these alternatives which

reduce the radiological risk, terrorism risk, and/or cost and/or environmental impact of spent fuel going to and from the Harris site. It is not enough to say the impacts fall within Table S-4 limits -- you have to say why, prove it, and also prove that other alternatives are not environmentally superior under NEPA or superior under the common defense provisions of the Constitution, and protection of public health and safety as stated 10 CFR 2 Appendix A VIII (b)(6).

26 The storage of spent fuel from Brunswick, Robinson, or other reactors at the Harris site would be inimical to the common defense and the public health and safety in that it would provide more radioactive material to be released by a terrorist attack on the spent fuel building at Harris, which Applicants' security plan does not assure would not succeed in breaching said building and releasing its radioactive contents into the air, water, and surrounding land area, perhaps also rendering the Harris units inoperable due to radioactive contamination (e.g. the cooling towers might not be allowed to function if their draft was lifting radioactive particles from a breached spent fuel building into the atmosphere; contamination of wiring and rooms inside the plant (e.g. control room, auxiliary building, might be too severe to be practically cleaned up or removed so that operators and others could safely work there and perform their necessary functions to assure the health and safety of the public in plant operation under an operating license and/or NRC rules) The means of such a terrorist attack include use of the weapons mentioned in the contention 24 2d above this one, re spent fuel shipment terrorism.

#-27 The ES is deficient in not considering the environmental

impacts of terrorism against spent fuel in transit or stored (as detailed, e.g., in the 3 contentions above this one) at SHNPP, the impacts of other terrorism against the plant with conventional and/or nuclear weapons as detailed in other contentions herein (the means whereof and alleged impacts thereof and who might do it being incorporated herein by reference). It also must consider the sociological impacts of such terrorism and the threat of it, on the basis of the effects thereof on the public (and not in comparison to worse threats, e.g. all-out nuclear war, but in comparison to the no-plant alternative and not issuing an operating license or license(s) to transport and store spent fuel at Harris) in considering the costs and benefits of SHNPP under NEPA.

28 Petitioner contends that Applicants' request for such licenses as necessary to ship spent fuel from Brunswick and Robinson (~~ex~~ identified by their DPR license numbers in the Application) to Harris and store ~~x~~ it at Harris should be denied because such request is overly broad, vague, unlimited as regards the amount of fuel to be shipped to Harris or transshipment of fuel from other reactors to Harris via Robinson and Brunswick as stopover or temporary (even for 1 day or less) storage locations, not specific as to the licenses requested or their conditions, does not supply sufficient information in the Application, ER or PSAR to evaluate the environmental and socioeconomic impacts of such spent fuel transport and storage under NEPA, fails to specify or consider alternatives thereto under NEPA and their environmental and socioeconomic ~~x~~impacts, is inimical to the common defense and the public health and safety as noted in the 4 contentions directly above and others mentioned therein, invites arbitrary and capricious action by the Board, and is

#29 The FP, FS, SFP, and other safety-related things including SHNPP technical specifications, filter capabilities, ability of gaseous radwaste system to trap radioiodines released from any or all gaseous release points of SHNPP design or from within the auxiliary building (where they could get by failure of containment penetrations, e.g. by embrittlement or dissociation of seals on same made of exposy or PVC letting radioiodines through in a pressure surge (e.g. from H_2 explosion) of simply by leakage once released inside containment e.g. by steam generator tube failures or operation of pressure-relief valves on primary system) are deficient in that they:

A. Fail to take account of evidence of Takeshi Seo, G. Steucek, Bruce Molholt et al (see e.g. Stuecek, Health Physics 41, Aug 1981, Outline of Molholt testimony, U. of Missouri, Millsenville I-131 data 3/16/81) showing underestimation of radionuclide exposure, esp. I-131 and other radioiodines at TMI, released 2 or more orders of magnitude (up to 64000 Ci) beyond NRC's admission of radioiodine release at TMI, and the hypothyroidism, thyroid nodules, thyroid cancers and other health effects resulting therefrom,

B. Inaccurately estimates the amounts of radioiodines to be released in Class IX accidents at SHNPP based on the above and other evidence (e.g. NRC Translation 161, Nrc Trans 520).

C. Underestimates the radioiodine releases in normal operation and the health effects thereof.

D. Fails to provide means, such as potassium iodide pills or capsules, readily available to citizens around SHNPP in the event of a radioiodine release.

E. Fails to provide means to specifically identify radioiodines (e.g. pressure-ionization monitors on all SHNPP gaseous release with backup monitors of similar capability so that

radioiodine releases at any time can be promptly identified and assessed for magnitude, especially when thunderstorms or other means of delivering such radio*I emissions in less dilute form than assumed by mixing models used by Applicants, NRC or in the ER and FS, to exposed persons, or when persons are nearby (e.g. on the lake at SHNPP, if CP&L's unswise & unsafe plan to allow recreational use of same (ER section 8, e.g.) goes into effect) and may be exposed due to inversion conditions in the atmosphere, wind patterns from the release point, rainstorms, thunderstorms, or other means including snow falling through the plume from the release point.

F. Fails to provide means of trapping radioiodines from any release point, once released there, to prevent same from injuring the public health or safety, or killing persons.

G. Assumes erroneous conclusions about radioiodine effects on fetuses and infants, such as was demolished in cross-examination of Dr. George Tokuhata (Tr 20,099-20,136) as noted in item 1722 of Partial Initial decision by ASLB in TMI restart hearings, 14 Dec. 1981, and ignores or insufficently considers more accurate conclusions and data, e.g. that of Gordon MacLeod (see, e.g. Ambio 10:18-23, 1981, Sec, Nuclear Engineering 26 #3, 1979)

H. Allows operation of SHNPP without equipment able to continuously register actual radiation levels being emitted (see, e.g. FSAR Vol 20 PP TMI-60-62 lack of pressurized ionization detectors or equivalent, and monitors off-scale, and NRC not having TLD's on site till 3d day of TMI-2 accident, all in NUREG -0600) & delivering same info promptly to the public, emergency planning personnel, radiation protection officials of State of NC, EPA and NRC, and others for their use in protecting public health & safety.

30 NRC's, CP&L's, Applicants'. State of NC's and federal emergency response plans for Harris are deficient in that they do not take account of and provide means to cope with & prevent damage from the potential radioiodine releases noted in the previous contention, do not provide the equipment, data, prompt notification of persons at risk, radiation monitoring data (including continuous specific real-time readings of actual amonts of radioiodines being released from SHNPP through normal release points or from other penetrations of containment which may leak) which is necessary to make prompt decisions to protect the health and safety of the public, do not assure that active and effective potassium iodide preparations (pharmaceutical) are in the possession of persons who might be affected by such radioiodine releases at the highest magnitude experienced at TMI according to T. Seo and other work, for their prompt use as would be necessary if radioiodines were released into a wind of the average site speed (above 7 mph, see ER) within 3 hours for all persons within 20 miles of SHNPP, in the plume path which might be any direction (see the almost circular wind rose of SHNPP site, ER) within 90 min for those within 10 miles of SHNPP, and within 7 hours for those within 50 miles of SHNPP, all such persons requiring KI as described above in their possession at all times SHNPP is operating because it is impossible and impractical to deliver it to them within the times noted above wherein a radioiodine release would reach those persons, particularly those working or playing outside buildings. Work crews, day care centers, school groups, schools, hospitals, prisons, jails and other such groups within 50 miles of SHNPP must also be provided with KI as specified above to protect their members + others present or in their care + custody from radioiodine health effects in a release from SHNPP.

#31 Applicants' burden of proof in this case includes proving that NRC Staff is able to, has and is going to carry out its responsibilities under the rules and the AEA to assure the health and safety of the public and accurately assess environmental and soicoeconomic effects (including psychological stress) under NEPA. Petitioner contends NRC staff is not able to assure, assess and carry out the above functions (* see note below for more specs) with respect so SHNPP for at least one and ~~xxxxxxx~~ probably all of these reasons:

(A) NRC Staff is under great pressure (e.g. from CP&L, the nuclear industry, Congress, Reagan) to turn out licenses for nuclear plants rapidly and has numerous O.L. applications before it; lacks sufficient staff to fully review same in accord with the above law, rules & responsibilities; is unable to attract or retain the most competent staff due to lower pay increases, lower morale associated with government service now due to e.g. public & private downgrading by the Administration (Reagan's) of the role and constructive purposes of regulatory agencies, RIFs and budget cuts at NRC and other agencies now or in future; does not have adequate procedures and staff to identify (+ insure correction of) design, construction and other errors in SHNPP and the other plants under review simultaneously (both) by direct inspection and checking of models, calculations, projections and records in all cases, as shown (p.5) by the debacle at Diablo Canyon (see, e.g. ASLB Partial Initial Decision in that case, July 17, 1981, item 3 at p.1, item 12 at p.5, and note 1 at p.3 where the seismic and Class IX issues were effectively dismissed, due in part to NRC Staff's failure to detect any of the more than 100 design errors affecting same issues that were subsequently identified (see tenth seminmonthly status report sent to Harris LPDR per NRC 4/7/82 at Apex NC) or to (bring any of same errors before the ASLB or) accurately consider the impact of such errors as NRC Staff had found.) Only luck and a junior engineer outside NRC staff brought these serious oversights to light.

The below includes NRC staff's taking positions virtually identical to CP&L's in the 1979 remand hearings, withholding a F. Cantrell's views, & other collusion with CP&L in the past & continuing now.

(B) NRC Staff has a history of collusion with applicants for operating licenses and other licenses including the suppression or withholding of information and views within NRC Staff that a applicants' plans, designs, equipment, personnel, and operations are or will be deficient or inadequate to protect the public health and safety; use of ill-qualified analysts, reviewers and witnesses instead of retaining or hiring well-qualified persons for these tasks; deleting or withholding information from ASLB's and the public including facts and Members of Staff's opinions information which support or tend to support the positions of petitioners/intervenors; collusion with applicants in, e.g., rehearsing cross-examination of NRC staff witnesses by applicants' attorneys with applicants' attorneys and staff present and participating in such rehearsal; adoption of Applicants' position on issues, due to collusion w/ or improper contact w/Applicants, all of the above being shown, for example, in testimony of Steven Shelley and Bob Pollard of UCS to members of US House Energy & Environment Subcommittee, Middletown Pa, 1982, documenting how the NRC Staff's "mandate to protect the public health and safety has been shunted aside". Petitioner believes that Applicants must prove there is no such and has been no such collusion in any of the above manners or otherwise with NRC Staff in connection with this case.

* such responsibilities include response to TMI per NUREG -0660 and -0737, review under NUREG-0880 and-0800, assuring compliance with all matters in 10 CFR 2 App A VIII(b), ALARA requirements for rad releases & exposures and 10 CFR 50.34, 10 CFR 51.21, & other applicable rules including all appendices to 10 CFR 50 and all of 10 CFR 50, Administrative Procedure Act, and regulations requiring proper conduct of Staff, e.g. 10 CFR zero.

32 The emergency response planning for the Harris plant is deficient in that it does not take into account accurately and fully, and it does not provide means of preventing, absorption of radionuclides as gases, liquids and particulates into cuts and open wounds in the skin of persons exposed to radionuclides released from the plant in an accident, including absorption and dissolving into the bloodstream or lymph or intercellular fluid, adsorption and deposition in the wound or cut, retained within the body during and after healing.

Such persons as hunters and fishers near SHNPP (within 10 miles, and perhaps within 50 or 100 miles) who had accidentally cut themselves, persons injured in auto accidents during an evacuation, persons injured in other ways who are at physicians' offices, emergency rooms, hospitals and other medical facilities around SHNPP in the area described above, or on their way to such facilities for treatment, children and students and others engaging in play or sports and suffering abrasions and cuts therein, being within said area and exposed or potentially exposed to the plume or liquid radionuclide release (e.g. spill into SH lake, swimmers in the lake or in rivers draining therefrom), are not adequately protected from the effects described above, which can significantly increase internal deposition of radionuclides unless all medical and treatment facilities in or outside the LPZ which may be called on to treat evacuees or persons exposed to radiological releases as above from SHNPP have appropriate detectors for radionuclide contamination, decontamination equipment and materials and training and traied personnel in adequate numbers to deal

with the number of persons exposed, bandages and other means of preventing radionuclide access to cuts and open wounds, and means to ensure that all cut or wounded persons potentially radiologically exposed receive prompt and effective treatment and protection(including decontamination) from the radionuclides above in a release from SHNPP.

(3) the plan does not assure that those who may be cut or wounded within the areas as noted above where they may be exposed to radiological releases from SHNPP are (1) warned of the risk of radioactive contamination from a release, esp. to cuts and wounds, and the meaning of warning signals, sirens etc and other means of notifying them when such a release occurs; (2) possessing the means and materials to shield and protect wounds and cuts from exposure to radionuclides whether airborne or water borne or particulates or gases, particularly gases such as Kr-90 decaying to SR-90; Xenon isotopes decaying to Cs-137 and Cs-134, and all other radioactive gases released from SHNPP or present within it which could be released in an accident, which decay into solid or liquid elements within a half-life of less than 10 days and thus are likely to, if absorbed or adsorbed as gases within the body, become particulates or solids or liquids therein and be retained as internal emitters.

(3) having prompt assistance, means and materials to do same for them if they are not able to do it for themselves by reason of injury, disability, incompetence, retardation or otherwise, including panic and psychological stress incapacitation or shock.

The ES and ER and FSAR take insufficient account of the self-ionizing ability of radionuclides decaying by beta decay, resulting in increased deposition of same nuclides on particles in the air, surfaces in homes and buildings, vehicles, skin, and human lungs, food, (and in other places) where they can be absorbed into the human body and

Increase radiation doses about 130 times vs. external rec.

33 Funding for additional legal, expert witness, study, research, copying and other costs of participating in this proceeding should be made available to petitioners and intervenors in this proceeding whenever and wherever allowed or authorized by law or court decision or either or both, and promptly, so that said petitioners/intervenors can fulfill better their role in these hearings which is to develop a sound record e.g. by litigating issues of importance to the environmental, soicioeconomic, radiological and health and safety consdequences of SHNPP plant operation and accidents at it, including emergency planning measures and plant modifications to reduce the probability, impact, consequences and effects including synergistic effects of accidents and transients and deterioration or corrosion (e.g. of steam generator tubes reactor vessel nil-ductility temperature rising) of plant equipment and supports therefore, and assurances that the plant has been constructed in accord with NRC rules, applicable codes, the construction permit, etc.(It hasn't due to use of unqualified welding etc personnel, Qa/Qc ~~fix~~ failures like weld inspection on pipe hangers and snubbers on safety-related piping, etc.) and that problems with the plant and deficiencies therein, are corrected in a timely and adequate manner to protect the environment under NEPA and the health and safety of the public under AEA.

This is particularly necessary for SHNPP because Applicants have used (vs. CCNC and Wake environment at the CP stage) their large financial and legal resources to prevent valid safety, health and environmental issues from being heard, e.g. by flooding intervenors and their attorneys with legal motions (T.S. Erwin can tell you about it, atty for CCNC -1972--77 etc)

by using frivolous discussion and legal motions to prevent intervenor witnesses from testifying fully (e.g. A.B. Lovins, witness for CCNC, 1977, who had to catch a plane, whose time in which to testify, see transcript, was taken up greatly with such discussion and with prolonged and ineffective -- except in wasting time-- voir dire), and by generally opposing, in collusion with NRC Staff or by themselves, ~~xxx~~ attempts to have issues heard that affect the environment or the public health and safety and are proper in this proceeding.

I also request appropriate extensions of time be granted me (esp during the 2 years from filing this supplement until hearing, when delays due to such extensions will not affect the hearing schedule or the possible licensing & operation dates for Harris 1 and 2, or for Harris 2 as appropriate) to respond to such flooding of legal motions and requests, and attempts to oppose the inclusion of issues contended herein ~~xxx~~ in the hearings to be held on this license to operate SHNPP and other licenses (e.g. rad waste storage and transport of spent fuel to Harris) requested by Applicants or to be requested later by Applicants herein.

And I request NRC Staff and its members to provide assistance to me in responding to such actions by Applicants as described ~~&~~ or listed above, serving, duplicating & mailing documents, obtaining data & documents necessary for such responses on a timely (ASAP) basis, & for such other assistance & info as they are required or allowed to give or vender to the public, petitioner(s) ~~&~~ or intervenor(s)

#34 The ES and SER are deficient in not including and evaluating the effects of "Class X events" which, in contrast to NRC's Class I through Class IX accident classification, are those events (including melting of the spent fuel pool, and/or blasting the spent fuel pool's contents into the atmosphere with high explosives, e.g. lowered into the pool by ordinary fishing reel(s) + detonated below the spent fuel PGM's, armor-piercing munitions or rockets or the like through breaches in the fuel handling building created by same or by shaped charges, plastic explosive, dynamite, TNT or other commercially available explosives or explosives (e.g. plastic explosive) that can be synthesized by a good chemist, which skill could be found (or equivalent skill levels) in a number of US and European terrorist groups, e.g. Weather Underground, Red Brigades, and also the PLO and the governments of Libya, Argentina, USSR and its allies, Cuba, etc) (and also including sabotage, terrorism and other acts against the reactor, its engineered safety systems, heat sinks, heat removal systems, steam generators and primary system, and the containment, by the means described above and using weapons, e.g. AR-15 rifles, grenades incl gas grenades or gases (poison, disabling, hallucinogenic) to disable security and plant personnel or get by them to do these things necessary to breach containment and release as much as possible of the core inventory of radionuclides to the atmosphere intentionally, whether during a refueling outage or during normal plant operation (there being easier access to the reactor for saboteurs or terrosits or both working as contractor employees during and outage)) NEPA, as discussed in IN 28 contentions below, as incorporated herein by reference, requires consideration of such events.

#35 Applicants' Security Plan does not provide means to reliably exclude terrorists and saboteurs from contractor work forces at the SHNPP during refueling as noted above, during repairs and during steam generator inspection & repair,

all of which bring or can bring large numbers of contractor personnel onto the SHNPP site and give many of them access to the reactor building containment, fuel handling building, and other parts of the site where at any of these places acts of sabotage and terrorism endangering the public health and safety, from minor disabling (e.g. closing feedwater valves, opening block valves) of safety-related equipment up to and including the Class X events described in the above contention. Applicants' security plan is insufficient to guard against, detect and prevent all such acts of sabotage and terrorism as referred to above, by contractor personnel on SHNPP site. It also does not prevent saboteurs and terrorists including agents of hostile foreign governments and terrorist organizations, disaffected former CP&L employees, mental patients or those who have mental diseases or defects such as paranoia, megalomania, schizophrenia etc which can lead such persons to commit irrational and destructive acts such as those described above in this and the immediately above contention, from gaining employment with contractors doing work such as moving spent fuel during refueling, transporting spent fuel, inspecting and/or repairing steam generators, and thus gaining access to the SHNPP site where they can do any of the above acts that endanger the health and safety of the public.

#36 Contrary to NEPA, the ES and SER do not give full and adequate consideration to Class IX accidents and Class X events (as defined above). Appendix D of 10 CFR 50 (since deleted) only exempted the Applicants from discussing Class IX accidents in their ER. It did not and cannot (nor can any other NRC rule validly) exempt the Staff or the ~~XX~~ ES or SER from considering same or the "Class ~~IX~~X" events described above, none of which

could occur absent the existence of SHNPP and are certainly to be included as "risk to health and safety or other undesirable and unintended consequences" under NEPA.

NEPA requires in pertinent part that the agency (NRC) produce or use in its review of SHNPP or any project under the act (e.g. license to move spent fuel to SHNPP or store same there) "a detailed statement ...on...environmental impact of the proposed action." in the context of NEPA, "environmental impact" of SHNPP meand whatever it is about SHNPP that changes, clashes with or affects the "natural environment", i.e. the environment without SHNPP. Since the risks of Class 9 and Class X events as described in this and the above 2 immediately contentions are not part of the natural environment in the zone of interest around SHNPP or in Eastern NC away from CP&L's Brunswick plant, it follows that NEPA requires a "detailed statement" on the "risk to health and safety or other undesirable and unintended consequences" of SHNPP under NEPA. These effects do not have to be "likely" under NEPA since the "likely" environmental effects apply to degradation of the environment, not to risks of accidents or "other" undesirable and unintended consequences" which Class IX and Class Xevents certainly fall within. The Act does not (& could not logically) say "likely risks" or "likely accidents" since if a risk or accident is likely, it is an effect or degradation.

Moreover, the accident at TMI-2, and considerable study on nuclear plant terrorism, terrorist attacks on spent fuel shipments and pools, etc. did not exist in the 1977 C.P. hearing and have not been previously considered in the EIS and FES of AEC on SHNPP or the CP decision and hearing. The 3 above contentions are thus based on new information per10 CFR 51.21 and on differences from the CP FES, CP EP, CP FSAR, CP SER, & ACRS results at CP stage.

#37 The long-term and/or short-term, and/or total health damage effects, genetic damage effects, and other environmental and socioeconomic harms (e.g. grief at death of a loved one from cancer, pain and suffering of the cancer ~~x~~victim, psychological stress from fear of radiation-induced cancer or genetic damage or disease in oneself or loved ones, expenses of cancer treatment, costs of and pain from operations to correct or attempt to correct genetic defects (and recovery therefrom), burial expenses, cancer insurance expenses, medical insurance expenses, cost of Price-Anderson insurance, cost of nuclear waste ultimate disposal for spent fuel, cost of isolating nuclear wastes -- as described below -- from the environment, increased susceptibility to other diseases + potential causes of death including allergies, asthma, pneumonia, heart attacks and others, synergistic effects of radioactive material and radiation in combination with other ~~xxx~~ carcinogens in the environment such as PCBs and other chemicals, asbestos, cigarette smoke, cancer viruses, cadmium and other elements, etc) resulting from the production of fission products, activation products, transuranic elements, actinides and decay products of all of these (including lead, arsenic, cadmium and other chemically poisonous elements as final, nonradioactive decay products, all of which result from operating a nuclear fission reactor) have not been adequately addressed or realistically estimated in the FSAR, ER, ES, SER and other documents to be filed or already filed in this proceeding. (R.G. Harris #1 or #2 or both)

Specifically, the estimates of BEIR III + II and NRC Staff and Applicants ~~xxxxx~~ underestimate the magnitude, number and extent of said effects, and their costs and socioeconomic and environmental ~~x~~impacts, in at least the following ways:

Data made available since the CP hearing in 1977 + analyses + studies since 1977 show that:

(A) there is no consideration of psychological stress as described above, of pain and suffering of cancer victims, disease victims and others such as their families and friends and loved ones whose numbers are underestimated also as described below and otherwise; or the consideration of same is deficient in underestimating the numbers of victims, undervaluing the pain, suffering, grief, psychological stress etc involved.

(B) the work of I.D.J. Bross, Rosalie Bertell (Ph.D.) and others shows that radiation exposure increases the risk not only of cancer but a host of other diseases, allergies, and causes of death including heart disease, heart attack, and others. The estimates of the numbers of such victims made by the preceding workers et al are more accurate than the estimates (if any) used by Applicants or NRC Staff or BEIR committee reports.

(C) the work of Mancuso, Stewart, Kneale, John Gofman, K.Z. Morgan and others shows that the cancer-inducing and genetic-damage inducing effects of radiation are considerably greater than BEIR-III estimates, due in part to sociopolitical pressure from the nuclear power industry and the nuclear weapons industry. The underestimates the work of the above scientists disproves result from incorrect understanding of latency periods for cancer and from considering only expressed dominant genetic defects (recessive genetic defects are thousands of times more frequent and will show up in future generations, most after the 10th generation following the genetic defect's creation by radiation), from models of radiation effects assuming a threshold or linear-or-less relation of radiation dose to response (genetic, cancer or other damage) when at low-doses an supralinear response is likely and is shown

in some cases (the citations of the above authors' work supra and below hereing are incorporated here by reference)

(D) the ecological and biological concentration of radioactive elements and chemicals as referred to above ims underestimated through the use by NRC and others of highly biased, unscientific "experiments" conducted by the AEC under pressure to show that fallout from nuclear weapons was less harmful than we now know it is (e.g. from thyroid cancers and abnormalities among those exposed at Rongelap, cancer deaths around St. George,Utah, and other areas near nuclear weapons tests in the atmosphers and underwater) which included:

Use of soils known to absorb less radioactive material from the atmosphere for the tests than do most soils in the USA and in NC near SHNPP;

Sterilizing such soils by heating in ovens to 400° F, and exposing the soil to strong ultraviolet radiation, which two things kill microorganisms that would be the first step in the biological concentration process for radionuclides;

Using fully grown plants not grown in such soils or exposed to radionuclides during their growth, to avoid the faster uptake of material from the soil in early stages of growth;

Removing the plants after only 3 days and examining the levels of radionuclides therein, thus not allowing the time for uptake of radionuclides available when plants grow to maturity in soils contaminated with any levels of radionuclides;

all of which factors systematically reduce the uptake and transfer of radionuclides and the number of concentrating steps it goes through in the environment below realistic levels, reducing the estimates below realistic calculations (Franke, Bernd, IFEU, Heidelberg W. Ger, NRC Translation 520) by factors of 10

to 10,000.

(E) systematically avoiding, preventing, SUPPressing or attempting to suppress the collection, analysis and/or publication of covering up, ignoring or otherwise unscientifically and biasedly treating data that does not accord with the nuclear industry position on radiation health effects, and bringing pressure to bear (including de-funding, loss of jobs, personal attackes, etc. as described in Gofman & Tamplin, Poisoned Power; E. Sternglass, Secret Fallout, Tamplin & Gofman Population Control through nuclear pollution, etc.) on those who find such data, make or attempt to make or publish such studies (e.g. case of Dr. Mancuso, hired by AEC, fired for refusing to dispute data indicating excess deaths from cancer at Hanford nuclear facility, Wash. state, as compiled by a study of all death certificates in that State.). One example of this is CP&L's moving of a monitoring site near their Brunswick nuclear plant near Southport NC which was showing higher levels of strontium-90; another is the "experiments" described above by AEC on ecological concentration of radioactivity; another is AEC's inaction for years on German data showing excess cancer deaths would result from breathing radon by miners working in uranium mines under conditions approved by AEC; another is NRC's + NRC staff's attempt to minimize the radiation release at Three Mile Island unit 2 in March-April 1979, e.g. the radioiodine(s) released as discussed elsewhere in another contention, the facts and references whereof are incorporated herein by reference.

(F) by not giving sufficient consideration to the greater radiation effects resulting from internal emitters, both by incorrectly modeling how much of radionuclides are

absorbed internally from a given release into the environment, and by underestimating the health and genetic effects of alpha, beta and neutron radiation on DNA and on cells' membranes and on enzyme activity. For more realistic estimates of internal absorbed doses of Sr-90, CS-137 and I-131 resulting from operation of nuclear power plants licensed by AEC/NRC and not shut down for excess emissions yet, see Land Educational Associates Foundation study published as a chapter in Methodologies for the Study of Low-Level Radiation and as "Nuclear Wastes: Time Bomb in Our Bones"; J. Gofman was chief consultant on this study and is an extremely well qualified radiation and medical scientist, M.D. and PH.D., number of patents and award-winning medical studies, AUTHOR OF MANY journal articles on radiation health effects, former associate director of Lawrence-Livermore Lab, etc. as detailed in Poisoned Power, and Radiation and Human Health (1981).

HP 34, 363-60 (1978) See, e.g. Health Physics (HP) 34, 433-438 (1978)

For a critique of underestimated effects of alpha and neutron radiation from internal emitters see papers by Karl Z. Morgan, director of health physics at Oak Ridge for 30 years, professor in nuclear engineering at Georgia Inst. of Tech, "the father of health physics", e.g. presentation and seminar at Physicians for Social Responsibility conference, Rochester NY May 1981, articles in Health Physics, Bulletin of the Atomic scientists etc. Dr. Morgan's qualifications in the field are likewise among the highest and best, being former chair of national and international committee on radiation protection (NCRP and ICRP) for many years, winner of many honors for his work.

(4) by looking at the health effects over some arbitrarily short period compared to the time when the radionuclides will actually be causing health and genetic damage based on their

experimentally determined half-lives and chemical nature allowing their incorporation into living tissue. For example, a plutonium atom cold enter my lung, cause a cancer that kills me, and still escape my coffin after 300 years, enter ground water, be swallowed by a child who then gets a genetic defect from the U-235 atom the Pu-239 has decayed into, and so on down the decay chain with more damage resulting as the radionuclides become (by entropy and by human activity and natural processes) inevitably more spread throughout the environment. (for details on the above see, e.g. papers by pediatrician Dr Helen Caldicott; Gofman, ~~xxxx~~ ops cit.)

Since the halflives involved range up to 80,000 or more years for some such elements (560 million years for U-235 created from Pu-239 alpha decay) these health effects will occur for a very long time, and genetic effects for an even longer period as most of them are recessive (see, e.g. Lederberg, J. on this)

Items (9) and (10) below are incorporated at this point by reference

See p.112

(I) Damage to health and the gene pool is real and does not have time value like money. Future deaths should not be discounted today. For comparison, consider how we view the actions of Tamerlane (said to have killed over 1 million people in just one city in Asia) Attila the Hun, or Hitler's Third Reich. Would anyone argue that creating comparable numbers of ~~x~~deaths is any less wrong if the means for killing operated over 1 million years instead of a week or a few years? Are the deaths themselves any less painful depending on when they occur? Not seeing the dead bodies before us all at once gives us a way to rationalize long-run radiation deaths as "not really there". But this is just as moral in considering socioeconomic and environmental effects as was Hitler's justification for killing Jews, gypsies and his political enemies.

One should recall (see, e.g. transcript of Nuremberg War Crimes Trials, 1947, 1946, etc; Rise and Fall of the Third Reich, Shirer) THAT Nazi doctors were condemned to death for conducting sadistic medical "experiments" in which people were actually maimed or killed. The killing of persons unknown to us in future generations, or of persons alive today, by nuclear radiation as from nuclides described above, and its effects, is no less immoral than these Nazi experiments. Such considerations must be weighed in an accurate assessment of the environmental costs and benefits of a project such as the Harris 1 and/or 2 reactors operating. These are real human lives in your hands, not statistics, and unless you would be willing to personally kill the numbers of humans which can be established by correcting the above-listed errors according to the work of the scientists, doctors and others listed above, and others working on the same and allied questions, you should not license this plant with a clear conscience. The fact that other licenses have been issued is as irrelevant as the number of Jews previously killed before a certain war criminal murdered his last victim at Dachau. The above considerations throughout this contention 37 A Turn I on radiation health effects have been systematically excluded from the EP, the FS, and the data filed by applicants in this proceeding, and insufficiently considered therein, leading to an improper balancing of costs and benefits under NEPA. and insufficient protection of the public health and safety under the Atomic Energy Act and the US Constitution which was established to "secure to ourselves and our posterity" the general welfare, blessings of liberty, and other good things which only the living can enjoy, and which those suffering from genetic damage are denied in whole or in part. (emphasis added). The radionuclides above are produced by reactor operation and not by construction of nuclear plants. They will not issue into the environment if the O.L. for SHNPP does not issue.

this page incorp by ref p. 110 at middle — 112 — contention 37 cont

(9) models used by NRC, Applicants and others systematically underestimate or exclude means of physical concentration of the above radionuclides and operate in addition to biological and food chain and other means listed in this contention for concentrating radionuclides in the environment and in the bodies of human beings, food animals, and other living beings, including physical concentration by

(1) rain storms or thunderstorms, snowstorms, hailstorms, and nucleation of ice, snow and rain around particulate matter in the atmosphere ("raincut" of radionuclides, "hot spots")

(2) radioactive decay products (e.g. Sr-90 from Xe-90) which have become ionized during previous decay or in any other way (e.g. exposure to lightning) attaching themselves by electrostatic attraction to fine fly ash particles emitted by coal-fired power plants of CP&L, Duke Power, TVA, and other such plants throughout the world which particles are in the air around the SHNPP site (within 50 miles or at greater distances); or radionuclides adsorbed onto such fine fly ash particles or absorbed into them or physically trapped inside them (the structure of many is hollow & complex, see, e.g., GL Fisher and DFS Natusch, Size Dependence of the Physical and Chemical Properties of Fly Ash) AND the deposition of such radionuclides on the fine (2micro meters and less, esp at ~0.2 μM) ash in the deep lung or in cells such as alveolar macrophages by means as described by Fisher, Natusch et al, C. Aranyi et. al.

(3) taking insufficient account of incomplete mixing and dispersion of radionuclides in gaseous, liquid or solid form when computing, assessing, finding or projecting compliance with the dilution and concentration limits of 10 CFR part 20; and taking insufficient account of the above factors in said computation, assessment, finding or projection, e.g. in computing releases of gaseous & liquid rad.effluents from SHNPP.

 incorp by ref on p.110

(10) Using for computational purposes in assessing the physical and biological concentration of radionuclides to be found in the environment the characteristics of less reactive chemical forms of the radionuclides involved, rather than the more reactive forms, e.g. use of Pu(III) or (IV) instead of PU(VI), ignoring or underestimating the effects of free radicals incorporating such radionuclides, excluding certain radionuclides from the computation altogether, and other erroneous computing, statistical and scientific procedures (e.g. as shown by IFEU, NRC translation 520: LTAF study above; other scientific papers on transfer factors and concentration of radionuclides; Sternglass' study of Sr-90 around the Millstone, CT nuclear plant). The above errors are compounded by NRC's action in discontinuing monitoring of milk for Sr-90, I-131, Cs-137 etc on a regular basis, which prevents the data on which to base a more accurate assessment of the radionuclides released into the environment by now-operating nuclear plants (& to be expected from SHNPP on the basis of the characteristics of its radwaste systems and management as compared to now-operating nuclear plants, & SHNPP's overall production of all radionuclides listed above) from being collected or available to petitioners or to other scientists and investigators. Inadequate radiological monitoring around & at SHNPP, before operation & after, including CP&L moving monitoring sites that show higher levels of radionuclides (as they did at Brunswick), lack of pressure-ionization or equivalent monitoring equipment that can identify the exact radionuclides being released or present in the environment, their quantities, etc., inadequate monitoring of milk, algae, biota, etc to detect releases (see, e.g. Pisiello et al on release amounts compared to sensitivity limits and accuracy of monitoring equipment, minimum detectable releases therefore, & other matters above. Pisiello (?sp) et al studied TMI Kr-85 release and other radioactive releases of general applicability to SHNPP)

The NRC has failed to consult the Attorney General per 10CFR App. Dive:

#38 Petitioner believes Applicant CP&L is engaged in a long-term plan to virtually totally monopolize the sale, transmission distribution and production of electricity in the eastern part of North Carolina (and in other territory where CP&L now operates, e.g. in & around Asheville, NC), of which the operating license at issue herein is a key part. This plan is a significant change in the SHNPP project + involves cancellation of Harris 3+4 + probably Harris 2 as well by CP+L to carry out said plan. Such monopolization would result from taking over the service territories of independent municipal systems and rural electric cooperatives both in CP&L's service territory, adjacent to it, and in electric service territory now served by VEPCO or other utilities. Such a monopoly would violate the Sherman Act, the Clayton Act, and other US anti-trust law by restraining trade, preventing competition, fixing prices, preventing entry of competitors into the market for electricity, and eliminating all (or most) other sellers of electricity from selling to customers in the territories described above except through CP&L under conditions essentially set by CP&L or subject to veto or effective veto by CP&L directly, under contract, or through extensive and expensive legal actions to prevent competitors from selling power in those areas, which legal costs CP&L would merely charge to its captive customers, while competitors would have to pay the cost of legal action themselves thereby being subject to an unreasonable barrier to entry into the power-selling business, all of this in contravention of PURPA as well as antitrust law.

Key parts of this plan by CP&L include the following:

(1) misrepresent the cost of future construction projects such as Harris Units 4,3,2 and 1, the capacity factors and power output from such power plants, the operating and maintenance costs of same, the design and safety characteristics of same,

and the likely cost of producing power from other sources or of freeing power resources by means such as weatherization and insulation of homes and buildings, shading, co-generation, ~~xxxx~~ time-of-day rates, interruptible loads, solar energy, biomass, methane and other competing fuels, and the likely cost and benefits of other means to reduce the electric bills of municipalities and rural electric cooperatives now or prior to 1981 customers of CP&L, VEPCO or other utilities.

(2) by the means in (1) above and by misrepresentation of the likely costs of power to said customers in the future from CP&L (from 1981 forward, for example), e.g. by not telling them of internal CP&L plans to cancel certain power plants such as Harris 4,3 and 2, South River 1 and 2, and others, induce said municipal and cooperative customers to enter into take-or-pay contracts for the output of certain CP&L generating plants including Harris 1,2,3 and 4 whether completed or not, whether operable or not, whether delivering any power or not, obligating said customers under virtually any and all conditions to pay a proportional share of the costs of operating, financing, repairing, disposing waste from, fueling and modifying the CP&L generating plants mentioned above, which are among the highest cost generating plants CP&L has or plans (in terms of fixed costs and of busbar power production costs). (See, e.g., Exhibits 10, 11 and 12 --originally styled 10a, 10b and 10c, contracts between co-Applicant in 50-400/401 O.L. NCMPA #3 (NCEMPA) and CP&L, filed in NCUC Docket E-2 sub 436 and NCUC Docket E-44 for such obligations.)

(3) retain generating capacity built at much lower cost (e.g. Robinson 2 which including steam generator repair in 1985 or thereabouts will have a nuclear capacity cost of about $400/KW or less, due to being built at a loss by Westinghouse as a turnkey project for CP&L for about $126/KW; Roxboro units 1, 2 and 3 with a capital cost combined under $100/KW; Asheville 1 and 2, Robinson 1, etc.) and which is more fully depreciated (both of which factors lower costs of electrical outputx which CP&L and its direct-served customers must pay for said plants' output).

(4) cancel units referred to in (1) and/or (2) above when economically advantageous to CP&L to do so, sticking the cooperatives and municipalities who are members of NCEMPA or are negotiating with CP&L to buy power as co-ops (NCEMC, etc.) or otherwise as described above.

(5) Through any combination of: knowing the actual high operating costs, repair costs and other costs the customers described in (1) above are obligated to pay under contracts in (2) above if computed on a realistic basis (info withheld by CP&L in inducing said customers to sign said contracts); improper maintenance and operating practice which results (by design or as a consequence of not being done right or in a timely, complete or adequate manner) in excessive or xx extensive outages of plants on which the said customers are obligated by said contracts to pay the fixed costs; deliberate sabotage and/or operation inadequate to produce the output, of said plants; withholding adequate staff, competent enough staff, sufficient funds, materials and proper design to repair or correct flaws and problems in said plants which result in extensive outages; scheduling of outages to coincide with peak demand seasons when

replacement power will cost more and be in shorter supply, whether done deliberately or through incompetence or through insufficient or inadequateplanning, scheduling and carrying out and conduct of outages, repairs, tests and modifications; designing plants with flaws (e.g. steam generator vibration problems, metal corrosion problems in steam generators and condensers, inadequate earthquake protection, core cooling, fire protection, electrical control, pipe and vessel supports and snubbers, containment, and safety related equipment) deliberately or not correcting same or concealing same in order to achieve (or resulting in) excessive outages; improper decisions to dispatch or not dispatch said plants; and other actions, including negligence (ordinary and ~~x~~otherwise) and/or cancelling any of said plants

to raise the costs paid by said customers under the take-or-pay contracts far in excess of the estimates under which said contracts were negotiated, creating a disparity between the higher rates paid by said customers' customers and the rates (lower due to lower-cost output from power plants ~~xxxx~~ in (3) above retained in full ownership of CP&L).

(6) to then offer, after customer dissatisfaction and/or inability to pay electric bills or continue operating businesses or industrial plant due to high electricity costs due to higher rates charged by said municipalities and/or electric cooperatives has built to a peak of pressure to lower electric rates, to buy out the electric system(s) of said municipalities and/or cooperatives, at a low price due to the pressure on said distributors of electricity to lower rates (which weakens their negotiating position as their rates continue to be raised by the means described in (5) above) or in any case at no more than the actual value of the distribution system involved, paying nothing for the franchise and distribution system beyond the actual value of the distribution system and thus obtaining a monopoly on distribution of electricity in

the assigned service territory of said municipality (ies) or cooperative(s) "for free" in exchange for releasing said distributor(s) of power from their take-or-pay contracts with CP&L, contracted directly or through a power agency, NCEMC or other corporation or association or legal fiction)

(7) to transfer the costs as shown in (5) above to the financially stronger members of power agencies, NCEMC or other such entity as in (6) above when the financially weaker members are forced into default by the higher rates created per (1)(2)(4) and (5) above, through provisions in the contracts as in (2) above which provide that the bills charged to members in default will be paid by other members, thus raising the rates of the financially stronger distributors in the first 3 lines of this section "(7)" even higher and precipitating for more of them the ratepayer dissatisfaction or inability to pay crisis described in (6) above with the same results for the financially stronger members (distributors);

(8) to force distributors and members and contractees with CP&L as mentioned above into default by the means in (5) and the consequences of inability to pay as listed in (6) herein, as well as the means in (7) above which can be used to create a domino-effect (the collapse of one distributor into default increases the pressure on the others, raising the likelihood of their default or selling out to CP&L per (6) above which would increase the pressure on the rest to default or sell out to CP&L likewise.

(9) over a period of years, to by these means and by direct purchase of such electric distribution systems of such municipalities and coops as described in (1) above under any other conditions, using revenues derived from the contracts in (2) above after cancellation in (4) above or otherwise , to monopolize

the retail sale and distribution, transmission and generation of electricity in the territories described herein, by gaining the franchise for distribution and retail sale in such territories by the means described above, and by using monopoly power and drawn-out legal action against competitors to prevent them from entering or continuing in the generation or transmission business for electricity in the areas (territories, service areas, all being the same thing described in different terms) described or listed herein.

#39 The NRC has failed to consult the Attorney General re this, too! CP&L, in violation of the Sherman Act, Clayton Act and other US anti-trust law, in concert with Applicant NCEMPA and others, is and has made and is making plans & contracts designed for restraining trade, preventing competition, and charging excessive prices by diverting large sums of capital derived from ratepayers of Applicant NCEMPA & others as such ratepayers pay all costs of bonds and all operating costs under take-or-pay contracts as described and referenced in the above contention under (2) and elsewhere therein, into the construction and operation of CP&L generating plants, to the detriment of investment in energy alternatives that provide (or avoid the need for or use of) electrical energy (or make it available for new uses) at costs ~~for~~ less than said ratepayers (citizens, co-owners, etc. included in this term as used herein) will be obligated to pay for power from CP&L plants such as Harris 1 and 2, and costs of Harris 3 and 4 under contracts as referred to above.

This imposes unreasonable costs above market prices on said ratepayers, and acts (by making them pay said unreasonable costs for electricity, raising their rates to whatever level necessary to pay said costs, without limit, due to contracts

set up by CP&L and others named or described above in furtherance of this conspiracy in restraint of trade and to impose higher prices and prevent competition in the electricity market) to prevent or restrain them from investing in such means of reducing electric consumption, using electricity more efficiently, insulating, weatherizing, co-generating electricity, displacing electricity with other "fuels" including solar energy, wood and biomass (or reduce the capital available for investment in same), in violation of the above-referenced antitrust law. Said conspiracy also reduces the market for energy-saving products, products using solar, wood and other energy sources, insulation and other products furthering co-generation, services and means to increase efficiency, reduced electricity consumption and more efficient use thereof including the means thereof described above, thus preventing the growth of businesses in these fields, services and products which would in effect compete with CP&L by reducing the market for electricity, restraining the extent to which CP&L or distributors of power such as NCEMPA and others described above (e.g. NCEMC) or municipalities or electric cooperatives could raise electricity prices (due to competition from those businesses, fields, products and services above), and providing alternatives to electricity purchased from CP&L (in its territory near said municipalities and coops, which might also be served by businesses in or near said muncipalities and coops with the products and services above) or from CP&L-run plants through the distributors described above, e.g. NCEMPA, NCEMC and municipalities and rural electric cooperatives. All of this violates US antitrust law.

And it is a significant change in the Harris plant, compared to its status at last antitrust review, for it to be so used, at the expense of ratepayers of the above distributors.

#3, 16, 31, 21-23 incorporated herein by reference

#40 I contend the Board must raise sua sponte any significant issue(s) under NRC's rules and the 7 purviews outlines in 10 CFR 2 appendix A VIII (b) that are not raised, not known, or not sufficiently specifically addressed by the petitioners in contentions (or not ~~addressed~~ raised by NRC Staff) here in this proceeding, and cause evidence to examine such issue(s) in depth to be brought before the Board, per the below!
(Further I request the Board to clarify how the Staff is expected to raise issues which could lead to the denial of an operating license under the rules as cited above.)

The Diablo Canyon (50-275 O.L. & 50-323 O.L.) Board's failure (partial initial decision III-17-1981) to raise the adequacy issue of earthquake-resisting structures design & construction in conformity w/ NRC rules, the C.P., + applicable codes is a clear example of why Boards need to do this. If it were not for a junior engineer's accidental discovery that blueprints for such structures had been switched between the 2 reactors, the public health + safety would now be being imperiled by over 100 other design errors in Diablo Canyon 1 + 2 discovered after (+due to) that initial accidental discovery of design error (see Marjone Rotschild letter to W.E., 4/26/82 in this docket, at 2, ref to Item 5, p.1, the 3/30/82 "Design Verification Program Tenth Semi-Monthly Status Report, etc." The Board must act sua sponte as requested above to prevent a similar situation at Harris, in light of NRC Staff's insufficient resources for safety review, Applicants' lack of competence, + the above arguments

see #3, 21-23, #16

see #31

#41 Applicants' Q/QC program fails to comply with 10 CFR 50.34(b)(6)(ii,iii,iv and/or v) and/or (7) and/or 10 CFR 50 Appendix B in that it fails to assure that safety-related equipment is properly inspected (e.g. the "CK" tagging of defective pipe hanger welds at SHNPP), thoroughly and accurately analyzed and documented (e.g. at Diablo Canyon, PG&E, a utility more competent than CP&L -- contention 3 + others above on management capability being incorporated herein by reference on the matter of CP&L's competence -- failed to detect over 100 errors in its safety-related equipment and structure design, analysis and construction by the proposed fuel load date in October 1981. Only the hand of fate prevented the Diablo Canyon plant being licensed to operate with all these errors and defects being uncorrected, thanks to the engineer who discovered the switched blueprints and had the guts to call it to the attention of superios & authorities. CP&L has had inspectors at Harris who can't even read blueprints well enough to detect such errors and discrepancies in welding of piping and vessels, design and construction of containment and other walls, support structures, etc. and safety-related pipe hangers), and correctly built and provably so (for reasons noted above, e.g.).

#42 Applicants' training program and operating plan is deficient and fails to comply with 10 CFR 50.34(b)(6)(iii,iv, vi) and (7) and other applicable rules because it does not provide the operators direct means of analyzing and seeing all at once the nature and condition of the core, cooling, radiation protection & control, & other safety related equipment all known failure sequences identified in Wash-1400 and other NRC/AEC studies of failure modexs, and because a comprehensive Failure Modes & Effects Analysis (FMEA) of the entire SHNPP design

as built (and verified to have been built this way, independently of the regular QA/QC program because of deficiencies in it and because of the kinds of oversights found at Diablo Canyon, which necessitated bringing in an independent outside consultant not involved in the design of D.Canyon or building it or modeling or analyzing it, as shown in NRC plan & reports filed in this docket at LPDR pursuant to 4/7/82 meeting at Apex NC, all as referred to, listed and described in the two contentions immediately above), as described e.g. by D. Basdekas of NRC in BN [redacted] 80-15 and other workers in the nuclear and aerospace safety field.

43 CP&L's safe management capability to operate SHNPP without undue risk to public health &safety and competence are in question because CP&L has not made good faith, timely and/or appropriate and/or effective efforts to comply with CLI-80-21 on environmental qualification of safety-related electrical equipment, including failure to take action to obtain, cause to be designed or manufactured and delivered to CP&L components capable of satisfying the requirements of CLI-80-21, NUREG-0588, and other applicable rules and guides. CP&L has not conducted sufficient qualification analysis, testing, replacement of safety related components, and/or development of procedures as the above rules require.

44 CP&L's management capability to safely operate SHNPP as ref'd in the contention above incorporated herein by reference re management competence, is in doubt because of CP&L's repeated failures to design, build, install and modify electrical equipment and other systems so that they are not bulnerable to catastrophic common-mode failures caused by fires, and because CP&L has failed to comply with CLI-81-12 of 6/15/81 in providing fire protection at its Brunswick nuclear plant. See C.E. Murphy 8/20/74 or thereabouts IE Region II memo re failure to properly install electrical cables at B.

#45 SHNPP design is deficient for protecting the health and safety of the public from nuclear accidents because its piping layout and design is so outdated (due to its being delayed by CP&L for ~~M~~ years when CP&L couldn't afford to build it, and its being of about a 1971 design) that it cannot be economically updated and redone to comply with the results of the Plant Water Hammer Experience Report, PWR S.G.(steam generator), feedwater, ~~MXX~~ ECCS & Main Steam System water hammer events evaluation (including systems effect) and potential resolutions now being prepared by NRC., and the CP and NUREG reports on the water hammer question. This issue is particularly applicable to Harris because of its outdated design, materials for piping and vessels, steam generator, borax injection pump valves flanges, nozzles Coolant pumps, MSIV, hot-cold leg nozzles, etc. made to outdated ASME III and other codes per 6/7/77 letter , 6/28/77 reply from CP&L to NRC, 5/17/77 letter MA McDuffie CP&L to Rusche NRC, the PSAR & FSAR at p. 1B-15c, IB-2 and IB-42a (maybe these are 1 B-2 and 1-b-~~X~~ 42a -- hard to read page numbers), use of unqualified welders, advanced stage of construction not allowing redesign to comply with NRC advice per the above studies and documents (thus requiring a trade between public health and safety protection from accidents, and costs to Applicants and delay of completing SHNPP), and the irregularities & deficiencies in hydrostatic and other pressure testing (use of pipes welded shut to be pressurized while the actual vessel is not under pressure, the shut welds in these test tap pipes and branches ~~XXXXXXXXX~~have been performed by some of Daniel International and CP&L's best welders) of such systems, and because of incomplete and inaccurate documentation of testing and materials of such equipment at SHNPP, particularly as regards the conditions under which it was stored on -site prior to installation.

#46 Applicants' FSAR and the SER are deficient in that it does not consider the consequences of an accident in which the reactor neutron shield falls and blocks coolant flow to the core. The bolts that hold up the neutron shield(s) have become extremely embrittled at nuclear plants such as Oconee, Robinson 2 and others, with some bolts failing. There is no assurance that such bolt failures would not drop the entire neutron shield at Harris 1 or 2 in such a way that it would block or divert coolant flow from the core, causing core overheating, fuel failure, possible formation of steam voids in the core, inability of ECCS systems to deliver cooling water effectively to the core because the neutron shield is blocking the entry or exit of such water, inadequate heat removal from the core because water cannot circulate in the loop or loops blocked by the fallen neutron shield(s), release of radioactive material inside containment as the core is vented to relieve overpressure caused by high temperatures, release of radioactive material to the environment caused by failure of containment valves, gas processing equipment, isolation valves, etc. in the condition described previously; partial core melt with subsequent release of radioactive materials to the atmosphere due to reactor sump pumping out irradiated water, or due to the failures cited above; release of radioactive material to the auxiliary building or to the atmosphere directly by sump pumping radioactive water in any of the above circumstances, or due to operator error, or due to the reactor vessel lid breaking off and penetrating containment or other parts of the vessel doing the same due to extreme thermal shock caused by the core overheating while cooling is blocked by the neutron shield, or shields, followed by movement of collapse of the neutron shield with a sudden influx of cold cooling water to the vessel, or thermal stress and shock resulting from cool water

injection on one side of the neutron shield in its fallen position while the overheated core is warming the rest of the vessel, introducing greater thermal stress and mechanical stress as primary system pressure rises due to rising core temperatures, or by other means, which results in vessel failure and possibly part of the vessel penetrating containment, or the reactor vessel being pushed off its supports by thrust loads from outrushing water, steam or core internals of any combination of these during and after the rupture of the vessel, leading to complete core melting because no way to bring either cooling water or borated water to the core will be left under these circumstances.

This type of accident is particularly applicable to Harris 1 and 2 in view of the age of the reactor vessels therefor, their being made to the W71 ASME III addenda to the S71 ASME III code, the age of the neutron shields and other equipment for the Harris plant, the fact that the reactor vessels and bolts and shields have been in storage and therefore can have deteriorated already before being placed in the reactors, the fact that storage conditions were not designed to protect the neutron shields and bolts that hold them up against aging, embrittlement, corrosion or other stress or attack, the fact that similar problems have been found at Oconee, PWR of about the same power as Harris (860 Mwe vs 900 MWe for Harris), and that hairline fractures in the bolts holding up the neutron shields can easily go undetected, letting the shields fall suddenly under later stress from earthquake, water hammer, normal plant shutdowns, etc., and the Harris plant has no direct means to tell if the reactor neutron shields are in place and firmly held there during normal operation or transients or other accidents.

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47 Applicants' accident analysis is deficient because it does not include proper consideration of fast fracture of the reactor vessel or associated primary coolant boundary piping and material. British metallurgy expert Sir Alan Cottrell (How Safe Is Nuclear Energy?, Heinemann Educational Books, London England and Exeter, NH, USA, 1981) who specifically investigated British plans to purchase Westinghouse PWRs (S. Harris is Westinghouse PWRs) describes the fast fracture mechanism as follows: "In many construction materials there is a critical stage, at a certain depth of penetration, at which a crack becomes unstable and will then run on rapidly in the material, at almost the speed of sound, to rip the material completely apart in a fraction of a second. It is this fast fracture which must at all costs be avoided." (Ibid., emphasis in original). quotes from pp 60-63, 77

A fracture the length of the reactor vessel (virtually) was detected at the Grohnde nuclear plant in West Germany some years ago. Fortunately the plant was shut down at the time. However, this actual crack shows that vessel rupture by fast fracture is a real possibility.

Specifically, Cottrell states that with a steam line break, pressurizer failure, steam generator tube rupture (contention 112 re steam generator tube failures incorporated here by reference), or other ECCS-initiating event, the prompt injection of cooling water into the hot pressure vessel could cause fast fracture. "In these circumstances, the ensuing changes of temperature and pressure can reduce the critical crack size [for initiating fast fracture] down to not much more than one inch in certain cases." (Ibid.)

Such a fast fracture could well result in failure of the reactor pressure vessel. Cottrell states that such a failure "could produce an accident of immense ferocity, with loss of coolant, breakdown of most controls, possible destruction of the reactor building

by large flying pieces [(of the ~~xxx~~ vessel)] and exposure of the core to the general environment." (Ibid.)

Another obvious consequence of sudden vessel rupture with flying pieces is shrapnel damage to other equipment and control lines inside containment (and outside, if containment is breached). (Contention 115 on reactor vessel head or other heavy debris penetrating the containment and rupturing it, with release of radioactivity to the external environment, and contention 97 on collateral damage to air, electrical and other control lines, coolant pumps, ECCS, the pressurizer, boron injection tank, and lines to move water and borated water etc. to and from the core, is also incorporated herein by reference.)

Because coolant injection could (and should) commence within about 20 seconds of scram (and could also commence after excessive blowdown or small or large break fractures in the primary system due to overpressure during an ATWS; contention 115 re ATWS is incorporated here by reference), core thermal power at the time of fast fracture initiation could well be above 5% of rated (2775-2900 MWt for Harris is rated core thermal power), and 100% or more during an ATWS. With the vessel fractured, effective cooling of the core would be impossible, and a meltdown of the entire core would almost certainly result. Applicants [redacted] have not analyzed this failure mode in the FSAR or any other report in the LPDR, so far as consequences of the accident are concerned, nor have they Applicants identified inspection methods for pre-operational and inservice inspection of the vessel that will detect cracks capable of fast fracture initiation under conditions like those described above, or under more severe conditions that may obtain. Cottrell (ibid.) notes that "In fact, tests of the best standard ultrasonic practice on thick steel plate have shown that there

" is a mere half chance of detecting even a once-inch crack. Clearly, an improvement in ultrasonic ~~xxxxxxxxx~~ techniques and procedures, to well beyond the best standard practice, is required if all potentially ~~potentially~~ dangerous cracks are to be detected. A minimum goal here ought to be the proven ability in practice to detect quarter-inch cracks with a fair (e.g. 50 percent) probability and one-inch cracks with ~~x~~ very high (better than 95 percent) probability." (emphasis in original). At p.77, he continues: "... recent tests of the reliability of ultrasonic inspections have shown that the chance of detecting a 1-inch crack is only about 50%. This gives... frequency × cores = 10 which is above the limit of acceptability" (emphasis in original)

The Shearon Harris "safety analysis" is inadequate because it does not properly consider fast-fracture accidents, nor their consequences (either worst-case direct release of the core to the atmosphere, or damage to the core, electrical or air or other control~~x~~ lines, power lines or steam lines to safety equipment and other equipment inside containment, especially the delivery of borated water and cooling water to the core, the initiation of multiple breaks in the primary coolant boundary due to ~~xxxxx~~ shrapnel or flying ~~b~~broken parts of the vessel, core, or objects they have hit during or after fast fracture, fracture or bursting of fuel rods after or during vessel fast-fracture, the sudden loading on reactor vessel supports, the core ~~i~~itself, and piping and other components attached to the core (all resulting from the momentum of escaping water or steam during fast fracture and after, as well as from the fracture itself), and other problems and difficulties resulting from fast fracture mentioned elsewhere in this contention). Since a ~~r~~raised reference temperature for embrittlement increases the likelihood of fast fracture, contention 48 is incorporated herein by reference.

48 The inspection plan (pre-service and inservice) for reactor vessel(s) and associated primary coolant piping at Harris is deficient because it does not provide means for detecting cracks that could cause fast fracture as described in Contention 47 above which

is incorporated herein by reference. This is particularly relevant to Harris because the vessels involved are not made to current ASME III codes for such vessels, and the vessels have been stored outside exposed to daily temperature changes for years, as well as the effects of air, wind, rain, snow, sunlight (including ultraviolet) on their external surfaces. ~~Contention~~ _____ on embrittlement of reactor vessels by a combination of heat, pressure, stress, neutron and other radiation, intergranular and other corrosion, etc. is ~~also~~ [redacted] another reason why the inspection program needs to take full account of cracks that could cause fast fracture before they reach the size (1 inch) that could initiate fast fracture. It isimportant to note that fast fracture does not provide a leak before fracturing. Cottrell (How Safe is Nuclear Energy, ref'd in previous contention) states that "There is no likelihood that the vessel would "leak before break". Therefore, the inspection program is the only way to detect potential fast fractures. In view of the extreme consequences of fast fracture (assured core melt, possible breach of containment, possible fast rupture of fuel rods, damage or disabling of controls and safety systems and other systems necessary to control the reactor or attempt to cool it or shut it down), only an inspection program that provides the very highest assurance (greater than the 95% detection probability suggested by Cottrell) can assure the health and safety of the public with respect to fast fractures. Contention 47 above is incorporated herein by reference as to initiation, consequences, detection and lack of prevention for fast-fracture accidents.

The effect of embrittlement (raised reference temp.) of the vessel in-service being to increase the probability of fast-fracture, and corrosion doing the same, contentions ____ and ___ are incorporated herein by reference.

49 The SH Nuclear Power Plant Technical Specifications are deficient in that they do not provide for an inservice inspection program for the reactor vessel(s) and associated primary coolant and ECCS and borated injection piping which can verify in practice that these components in fact do not contain any cracks which can initiate ~~xxxxxxxxxxxx~~ fast fracture as described in contentions 48 and 47 (incorporated herein by reference).

Such a program of inspection, including reliable baseline data verifying all cracks in the vessels and piping as installed, down to less than 1/4" (or whatever size is necessary technically to assure that said crack cannot grow, during normal operation including accidents, shutdowns and unusual events at at least the frequency encountered in PWR operating experience, to the size of greater than 1" --or whatever other size is later determined to be capable of initiating fast fracture under any condition that may occur in the nuclear plant -- which can initiate fast fracture, during the nuclear plant (SHNPP's) remaining expected or projected operating lifetime.) is necessary for safe operation of this nuclear project at all times.

The technical specifications do not exist as yet, tho suggested ones do, which do not address this issue. The difficulties of such inspection being adequately done are detailed in contentions 48 and ____ above, incorporated herein by reference.

Further, the technical specifications are deficient in that an ultrasonic inspection capable to detect all and any cracks in the reactor vessel and primary coolant, ECCS and borated water systems (including all parts as described above) is not required to be performed after each shutdown of the reactor, before startup begins. The TS's are also deficient in not requiring a cold shutdown and complete re-inspection for cracks capable of initiating fast fracture whenever any evidence (e.g. reassessment of size of capable cracks, for fast

fracture, new data indicating increased likelihood of formation of such cracks from the effects of heat, temperature changes in the vessel and piping from whatever cause, radiation including neutrons and other forms of radiation, corrosion from any cause, water spray or flooding the outside of the reactor vessel (whether as Occurred at Indian Point, NY or otherwise) or for any other cause) indicates that such cracks may exist undetected in the reactor vessel or associated systems as referenced above, where integrity of the vessel or associated systems may be lost by fast fracture.

50 Since there is no evidence that inspections to date have shown that the reactor vessels for Harris Units 1 and 2 are not already containing cracks that could initiate a fast fracture(as described in contentions 47 and 48 above which are incorporated herein by reference), the Board should order construction on Harris units 1 and 2 suspended until such time as Applicants can definitively show that the reactor vessel in place in Unit 1, and the reactor vessel for Unit 2, do not contain cracks that can initiate a fast fracture already. As noted by Sir Alan Cottrell (How Safe Is Nuclear Energy?,1981)"an improvement in ultrasonic techniques and procedures to well beyond the best standard practice (of today) is required if all potentially dangerous cracks are to be detected." (Cottrell put that entire statement in italics for emphasis). Ultrasonic testing pre-service should be used because the in-service inspections must have a comparable data base to check against, assuming that defects are not found pre-service.

Radiography on such thick structures as reactor vessels is impractical, particularly on curved surfaces such as where piping enters the vessel, and this is well known. Therefore radiographic inspection of the vessels for Units 1 and 2 would not be adequate by itself to assure that fast-fracture initiating cracks do not already exist in them (cracks of about 1" length).

The reason to suspend construction pending this verification is that if such cracks as noted above are found in the vessels, it will be unsafe to use them because fast-fracture accidents could occur at any time the reactor is operating. Therefore no more money should be spent on construction of the rest of the plant until it is assured that the reactor vessels are not now subject to fast fracture. (If only one vessel were subject to

fast fracture, construction on the unit incorporating the vessel not subject to fast fracture at present could be resumed.)

A reactor vessel subject to fast fracture is pr'ma facie unsafe, since it can burst unpredictably at any time, resulting in total core meltdown possible release of core inventory of radioactive material directly to the atmosphere, and other consequences detailed in contentions 47 48, 92 & 115 incorporated herein by reference re fast fracture, thermal shock, vessel embrittlement, or ATWS, etc.

Under the Atomic Energy Act, NRC has no authority to license construction or operation of a nuclear power plant that is unsafe. Therefore construction on Harris Units 1 and 2 must be suspended until verification that the vessels for those reactors are not now susceptible to fast fracture as shown by the presence of cracks 1" or longer in them at any point, or the health and safety of the public is no longer protected adequately. Further, under NEPA, the costs and risks of fast fracture must be considered; they are not accurately and completely considered in the FP or the CP EIS, nor in the OL EIS which doesn't exist yet. Construction may not proceed until these risks and costs are included in the EIS, particularly since fast fracture of the reactor vessel could destroy the nuclear plant itself and spread the core's radioactive content over most of Eastern North Carolina (ref. W. Ger. Institute for Reactor Safety Report #290,(NRC translation 161), and contentions 115 incorporated herein by reference).

It should be clearly understood that the kind of inspection described herein is better than the standard practice, and perhaps better than the state of the art for thick, layered pressure vessels. However, verification that no fast-fracture initiating cracks exist is absolutely vital to the safe operability of any nuclear reactor pressure vessel, for if it has such a crack it may fail catastrophically, at any time.

#51 Applicants' metal surveillance and fracture toughness fatigue testing programs fail to meet the requirements of 10 CFR 50 Appendices G and H in that: the requirements of 10 CFR 50 Appendix H section II.C.3.c apply to Shearon Harris since Appendix G.V.B. requires that the ~~xxxxxxx~~ ~~xx~~ "basis ~~a~~for the prediction" used in Appendix H"shall include results from pertinent radiation effects studies " and that one such pertinent study is the fact that the reference temperature for nil ductility at the CP&L H.B. Robinson #2 reactor is already, after about 11 years of commercial operation (far less than its "expected service life" of that reactor vessel) is between 250 and 290 degrees F and that this is a "conservative(ly demonstrated ... test(s) performed on comparable vessels and steels"within the meaning of Appendix H section II.C.3.a and b, particularly in that CP&L has stressed the similarity of HB Robinson 2 and Shearon Harris 1 and2 in defending its estimate of nuclear capacity factor for Harris before the NC Utilities Commission (Dockets E-100 sub 40 and E-2 sub 41 ~~X~~6,1981), both are Westinghouse PWRs, the Harris 1 and 2 reactor vessels are made to the W 71 addenda to the S71 edition of ASME III (Letter 5/17/77 M.A. McDuffie CP&L to Ben C. Rusche, NRC under oath) which is not that far different from the Robinson reactor vessel. The Harris reactor specimen Capsules for surveillance (APP H II.C.1 and 2) do not meet the numerical requirement that there be 5 of them per Vessel (it says 6 total) H IIC.3.c and are not exposed to pressure and metchanical and temperature-pressure induced stress from vessel heating and cooling under pressure and from pressurization and depressurization as required by 10 CFR 50 App H II C 2, C 3 d, and fails to meet the requirements of 10 CFR 50 Appendix G IV (B) or V C 3 in that appropriate allowances for "all uncertainties" have not been made, particularly for synergistic effects of corrosion, radiation (neutron and other), cycling up and

down in temperature, and cycling in pressure on similar material to that actually contained in the vessel, that further increases in reference temperature have not been accurately allowed for, that the rate of increase in reference nil-ductility temperature is not understood well enough to make accurate predictions of its level at the end of the service life (expected by Applicants) of the Harris 1 and 2 reactor vessels, particularly in light of the actual rise in reference temperature at Robinson 2 and other large PWRs such as Oconee 1, TMI 1, etc, and this leads to an uncertainty in projected reference temperature at the end of vessel service life that has not been accounted for. Also the requirements of 10 CFR 50 Appendix G IV C have not been met for Harris 1 and 2 in that they are not designed to permit a thermal annealing treatment to recover material toughness properties of ferritic materials of the reactor vessel beltline and nozzles, piping connections, inlets and outlets in the vessel. Yet, as shown by the experience of Robinson 2 and the other reactors cited above, there is no reasonable basis to predict that the reference temperature for Harris 1 and 2 at the end of their service lives, whether assumed to be 40 years (per FSAR), 30 years, or 25 years (depreciation life per FR) will be less than 200 degrees F when Robinson 2 and Oconee 1 and other PWRs of less core power have already reached reference temperatures above 200 F in less than 12 years of operation. Tables 5.3.1-8 (Unit 1) and 5.3.1-11 (#2) of the FSAR are in obvious error for the above reasons + do not provide a conservative analysis necessary to protect the public health + safety from reactor fast fracture with or without thermal shock.

52 Applicants' safety analysis is deficient in that it does not consider the total consequences of terrorists commandeering a very large airplane, such as a B-747, Airbus A-300, Lockheed L-1011, or USAF C-5a or C-5B and diving it into the containment. Terrorists threatened to do exactly that to a reactor at Oak Ridge in the 1970s. The consequences include not just the impact, which the containment might not be able to withstand, but also fires resulting from the combustion of thousands of gallons of jet fuel that could be ignited, e.g. by sparks from metal scraping on concrete of the containment at or after impact, by sparks from debris from the plane striking each other or other objects such as containment or the auxiliary or spent fuel building, by hot objects such as the jet engines, which themselves might be thrown or bounced by the impact (which would certainly rupture the plane's fuel tanks. Terrorists using explosives or other nonmetallic weapons are able to take over airplanes despite the use of metal detectors. An empty airplane being flown by a crew to or from Raleigh-Durham airport, Seymour Johnson AFB, Greensboro-High Point airport, Douglas Airport in Charlotte, or other cities near the plant (in terms of jet flying time) might readily be commandeered by a small group of terrorists or even a single terrorist who got onto the flight line (e.g. by disguise as regular airline, airport or military personnel or by being one) when planes are being flown empty to pick up cargo, for maintenance, or to move them to a point to receive passengers.

Further consequences of such a plane crash (caused by terrorists or not, as, e.g. an accident causing all a plane's engines to lose power in a heavy fog or cloud cover might cause it to crash into the nuclear plant without warning -- local air controllers should have special training to help prevent this possibility) include

damage to the spent fuel building and auxiliary buildings and release of spent fuel gases and particulates and halogens to the atmosphere, failure of safety-related equipment including pumps, control wiring, air lines, water lines, and access to the heat sink of the plant, all caused by the plane or debris breaking open the buildings, crushing, cutting, or disabling the spent fuel or safety equipment or control wires or lines; by fire in the wake of the plane crash; or by the plane's being deliberately or accidentally aimed at the fuel handling building and fuel pool(s), or the auxiliary building, both being unable to resist a plane's impace as the containment might. In the event of a large plane crashing directly into the spent fuel building, accidental criticality among the fuel rods stored there could result from sudden compression and crushing of fuel rods under water and the destruction of poison rods if any are present; the building itself would readily be breached and probably destroyed, in any event after such a plane crash it would be unable to prevent the release of radioactive material to the atmosphere, which accidental criticality of fuel assemblies and a subsequent fire in the plane's fuel following the crash would clearly enhance by providing more radioactive material (fission products) and a strong updraft into the air respectively. The Harris plant is close enough to the Raleigh-Durham airport, in the general direction in which planes take off and land, to make both accidental and terrorist-caused plane crashes into the Harris plant a greater concern here than for many nuclear plants. Expansion of Raleigh Durham airport is now being begun to accept larger planes (e.g. 747s and L1011s) on a new runway that is also north-south (south points in the general direction of the Harris plant from RDU airport, i.e. the runways are pretty much aimed at the plant, except for a new general aviation runway planned for small planes. The large number of nearby military bases also provide greater opportunity for terrorists to divert military planes to strike the Harris plant.

#53 The Harris plant is inimical to the common defense and security under the U.S. Constitution in that it provides a tempting target in its reactors, spent fuel pool and spent fuel transport to the plant from other reactors for: terrorists, saboteurs, and hostile nations able to use armor-piercing weapons, precision-guided munitions, cruise missiles, ballistic missiles, air-to-ground missiles, radiation-seeking missiles and other means (with conventional warheads) to explode the plant's radioactive inventory in the core(s) or spent fuel or both (including spent fuel in transit to the plant) into the environment of eastern North Carolina, doing unacceptable damage to the land and people thereof, and threatening the military facilities at Ft. Bragg, Camp Lejeune, Norfolk, Seymour Johnson AFB, Cherry Point and others with serious radioactive contamination, diverting resources that may be needed for defense to disaster relief, making it less possible to defend eastern North Carolina, and causing other harm to the common defense. The raid by Israel on a nuclear research reactor in Iraq, and the destruction by terrorists in France of reactor components destined for Iraq, show that such events are possible. They would be tempting to enemies of the U.S.A.

#54 Issuance of licenses to operate the Harris reactors, store spent fuel from other reactors there, or transport spent fuel to the Harris site and store it there are inimical to the common defense and security in that by use of thermonuclear weapons on MIRV-type buses designed to fire precision-guided conventional explosives into the containment several times, followed by precision-guiding a nuclear warhead (H-bomb) through the hole the PGMs make in containment from above to the reactor itself (fused to explode -- proximity fuse and radiation detectors for neutrons,

xxxxx,beta and gamma radiation attuned to uranium-238, CS-137, and other appropriate emitters giving a radiation signature of the reactor core, with appropriate logic -- within a few meters of the reactor vessel) can thus create a thermonuclear explosion including fast fissioning of a considerable portion of the 100 tons of U-238 in the reactor itself. (It may be necessary to also blast through the reactor vessel head, cranes, and other items above the core to get the thermonuclear bomb sufficiently close to the core that a large proportion of of the core uranium would fission, using the core neutron reflectors to increase the amount of uranium that fissions. Again, this could be accomplished using additional PGM warheads incorporating conventional explosives, and warhead-guidance and detonation logic that explode the thermonuclear device before the debris from the other explosions damages it. One obvious option to avoid such problems would be to strike during a refueling outage, the schedules for which are public information in the USA, During refueling, the reactor vessel head will be off, the core exposed under water, and the type of nuclear warhead used for air-to-sea nuclear depth charges would be able to penetrate directly to the core, which would have at least 2/3 of its U-238 present in the 2/3 of the fuel rods, not being,changed, or substantial amounts (tons) of U-238 in any event.) The result of the above scenarios is a nuclear explosion of multimegaton power, involving the fission of tons of U-238, by an appropriately designed (e.g. to throw more neutrons forward -- at the core) nuclear warhead delivered to the reactor by any means above or other means (e.g. carried in by a saboteur), causing much more massive destruction and fallout from a ground burst of this magnitude, not to mention vaporizing the entire radioactive inventory of 2 nuclear cores

and the entire spent fuel pool. While only a few nations now possess the guidance PGM and nuclear technology necessary to do this (e.g. USSR, Israel) the number of nations able to do so by the year 2000 (giving Harris a 15 year life) or 2013 (CP&L's depreciation life for Harris 2 ends then) will be much greater. A small nation or terrorist group could make a tremendous impact with the bomb by such an attack as described herein. Means of discovering the necessary technologies mentioned above are readily available to many nations and even subnational groups such as the Palestine Liberation Organization (known to engage in terrorism, though in so stating I make no judgment as to the justness of their cause, for terror has also been used against them). Such nations and groups include Libya, Argentina, Czechoslovakia, Sweden, Korea, Taiwan, Iran, Japan, China, and virtually all nations allied with the US (e.g. in NATO, ANZUS) who will be able to produce the devices described above by the year 2015 if not by 2000. Some such nations are actively hostile to the US today (Libya, Iran, govt of Czechoslovakia etc); others are unstable (Korea, Taiwan, Argentina etc) and may become hostile to the US; still others, e.g. US allies, provide a place where terrorists could obtain the nuclear technology and materials necessary to make a nuclear bomb they would then move, by subterfuge or force, next to a nuclear reactor core for the purposes of extortion or terror or calling attention to their cause. Many technically sophisticated terrorist groups now exist, hostile to the US, e.g. Red Brigades of Italy, who would not hesitate to attack nuclear power plants in the USA. Harris is particularly vulnerable to foreign terrorists because it is in an isolated rural location (hard to make sure not one gets near it or provide security to track every one near it -- plenty of places near it to hide and prepare a terrorist attack) right next to a cosmopolitan location (Research Triangle Park, major univer-

They could get a lot of bang, revenge or publicity etc. with a small effort - as few as 6 people could carry out a terrorist nuclear bomb attack, threatening to blow up the Harris spent fuel pool or core with the small nuclear weapon they had built, or blowing it up, leading to a major radiological release (deliberately maximized "Class X" release)

sities and hospitals, where it is common for foreign nationals to come and go, which has good transportation connections, and which can be approached within 1 day's car travel of many international airports and from NC's own seaports, which are small and lack sophisticated and extensive security forces, or from NC beaches on which terrorists could land. As drug-runners ~~xxxx~~ show, NC is also in ready reach of the Bahamas, Cuba, Jamaica, carribean nations, Colombia, Nicaragua, and Bolivia, some of which nations may harbor terrorists or not exert full control over their territory (e.g. areas controlled by drug-growers in Colombia, Jamaica, etc.) and thus could not prevent terrorists using their land as a base for long enough to prepare the requisite nuclear device (or all its parts) and then transport same to North Carolina by air or by sea, quite possibly undetected. The open area around the Harris plant provides plenty of space for a plane to land: a seaplane could land on the Harris lake; the woods around the Harris site provide good cover for terrorists; finally, CP&L's general lower competence, drug use among guards at Harris, inadequate security plans (which do not include means to detect the approach of special nuclear materials carried into the plant for terrorist purposes) and other weaknesses of CP&L make Harris a tempting target for nuclear terrorism and "Class V" events as outlined above.

54 Applicants' security plan for the Harris site is deficient in that it (A) may not now exist (B) does not provide adequate defense against terrorists armed with modern military equipment which may come, e.g. from nations backing terrorism against the USA, such as the USSR, Libya, Iran and others(The USSR has supplied anti-aircraft rockets to terrorists in Italy. Such rockets could severely damage the spent fuel building and pools, the cooling towers, the auxiliary buildings, the transformer yard and other facilities at Harris, or blast open a truck or rail cask carrying nuclear wastes to or from the Harris site (spent reactor fuel from CP&L's Brunswick and Robinson reactors is such a waste)) (C) does not provide adequate defense against terrorists using modern military equipment diverted from military bases in North Carolina including Ft. Bragg (82d airborne and Green Beret units with light and heavy weapons including machine guns, grenades, mortars, submachine guns, bazookas, antitank missiles, precision guided bombs, helicopter gunships, plastic explosives, and quite likely incapacitating gases such as BZ and nerve gases), CampLejeune (Marine Corps, stocking all the types of weapons listed for Ft. Bragg and also equipment for waterborne assaults, e.g. inflatable rafts), Seymour Johnson AFB (aircraft with air-to-ground missiles, air-to-air missiles, precision guided bombs and other munitions), Cherry Point Naval Air Station (same equipment plus air-sea rescue equipment that could be used to mount an attack). We also have nearby Newport News Va naval base and Fort Jackson, SC and Myrtle Beach AFB which also stock all of the weapons listed above. Weapons thefts from these military bases do occur. (D) does not provide assurance that terrorists will not be able to enter the plant by air, ~~xxxxxx~~ water or land, e.g. by parachute, helicopter, raft, or armored ~~x~~ vehicles, and once inside e.g. by employing NRC's "barrier penetration database" techniques damage or destroy key safety equipment or the spent fuel building or the reactor's heat sinks and access to

these heat sinks; (F) does not provide assurance that control room personnel and plant security can function if the plant is attacked by terrorists using incapacitating gases obtained from military or civilian sources, domestic or foreign, including hallucinogens, nerve gases, other disabling chemical agents absorbed thru the skin or lungs, such as military research has produced in the USA CS or CN tear gas, mustard gas, chlorine, STP, LSD, DMT, Sarin, Tabun, or vomiting gases of the type used by the US military in Vietnam; (F) does not provide means, by security or strengthen or otherwise, to prevent the spent fuel pool(s) from losing their water supply and having their containment breached by attack with precision-guided munitions including rockets, anti-tank rockets, guided bombs, guided incendiary bombs (napalm, etc), armor piercing rockets, shells and mortar shells designed to penetrate armor or reinforced concrete, etc. One credible scenario is for the terrorists, establishing position anywhere within 3 km, to fire one PGM or other explosive device to breach the spent fuel building wall or roof, and then to fire others after it, going through the hole made by the first or later rounds to wreck the spent fuel itself, releasing radioactive material to the atmosphere. PGM's or other explosives could also befired at the water lines supplying the fuel pools, at the pumps for this water supply, at the cooling towers (explosions near the base might well cause collapse with only 2 or 3 rounds hitting each tower, at the auxiliary building, or at the transformer yard and switchyard (which would lead to loss of offsite power). several rounds of PGM or mortar fire could be fired by only a few persons within one minute, certainly within two minutes, before security could reasonably be expected to react and stop them. (G) Applicants' security plan fails to take steps to exclude the bringing of plastic explosives or other high explosives onto the plant site by saboteurs among Applicants', contractors', NRC's or other personnel (e.g. visitors) such explosives could be planted next to or on or under pumps,

water lines, fuel handling building walls, air lines, electrical control cable trays, or other equipment outside containment; during steam generator inspection and repairs, primary and secondary piping inside containment, the steam generators themselves, the reactor, reactor coolant pumps, pressurizer, and other equipment could be "mined" with explosives brought onto site by saboteurs. Such explosives, however they got in place, could then be detonated by chemical or electrical means including slow chemical reaction fuses, a powerful spring in acid held back by a thin wire the acid eats away, letting the spring hit a chemical detonator, batteries, or even initiation from plant wiring, e.g. when the ECCS comes on, the control impulse fo start the motors for the ECCS pump(s) could also have been surreptitiously wired to set off explosives that would disable the pump(s) or break the pipes carrying cooling water to the reactor or do other damage. All of the above are means of inducing multiple failures in safety-related systems and other systems, which can credibly lead to releases of radioactive material to the atmosphere, e.g. by preventing core cooling leading to a meltdown, by causing massive sudden failure of steam generator tubes from an explosion inside the steam generator, leading to a LOCA and meltdown, particularly if it were done on all the steam generators, or by blasting open the equipment hatch in the containment, under any of the above circumstances, either internally by explosives or from the outside with mortars, missiles or precision guided munitions including rockets, armor-piercing and anti-tank PGMs, and precision guided bombs.

(H) Applicants' security plan fails to assure that high explosives, poison gases, disabling gases or hallucinogens, any of the gases in (E) above, or the reactive chemicals of binary nerve gases (harmless individually but reacting to form the nerve gas, which is absorbed through the skin and deadly to anyone without the antidote (atropine sulfate or similar chemical) are not brought into the control room

of the reactor, where all operators could be totally incapacitated by nerve gas, poison gas or explosion released without warning, and a saboteur with appropriate equipment and preparation (e.g. atropine sulfate injection, gas mask made to exclude the poison gas used, air pack, etc) would then be free to destroy the control system of the power plant, turn off circulating water to the spent fuel pools, or program the computer or manually open vents, valves and bypasses to filters, waste gas tanks, liquid waste tanks, etc. so as to deliberately release radioactive material to the atmosphere. For example, the control rod banks could all be withdrawn, and the SCRAM system disabled, and the relief valve on the pressurizer opened, leading to an extreme power excursion accident beyond the limits of a normal ATWS (esp if block valves to the ECCS and borated water system were also closed by the asboteur or accomplices) which dould either blast the reactor vessel head through containment (APS, 1975) or release radiation to the atmosphere (and radioactive material) through valves and vents deliberately opened for that purpose. Many other such sequences of destructive events could be carried out by saboteurs, and I am unable to describe them all, though I have outlined a number of means and events and sequences that could happen, which the security plan does not have means to prevent.

(I) Applicants' security plan fails to take sufficient measures to prevent the use of drugs by personnel on duty, see IE Info notice 82-05 of 3/10/82 including security personnel, operators, supervisors, technicians and all other persons with access to safety-related equipment or to the control lines to and from such equipment or to and from such equipment and the ICS or control room or instrumentation needed for safety functions to be carried out. Specific drugs that can alter performance or impair

mental functioning or motor functioning of personnel include alcohol, PCP, DMT, LSD, STP, marijuana, hashish, and prescription depressants such as Tuinal, barbiturates, and a host of other readily available legal and illegal drugs. Reportedly, such drugs are used on the plant site at present by numbers of people while carrying on construction work (or before working), and this is evidence that the plant security system is unable to detect these drugs being brought onto the plant site and is unable to prevent their use by personnel who must be alert and in full possession of their normal faculties to properly do their jobs. The risks of having drug-affected personnel controlling a nuclear plant, responsible for its security, or performing important functions such as testing and maintaining equipment, reading instruments, opening and closing valves, bypassing safety equipment and controls for tests, etc. are strikingly obvious. Drugs can cause or compound human error, particularly alcohol and hallucinogens and depressants, as is well known. It is obvious that operator error could impair the safety functions of the plant, e.g. by hitting the wrong switch, reading an instrument wrongly and acting on that information, etc. If an accident occurs and drug-taking personnel have to respond to it, they are likely to make more mistakes which make the accident more serious. For example, an operator using alcohol or depressants might fall into a control panel after a reactor trip, sending any number of spurious signals to equipment, all of which would have to be recognized and corrected at the same time that other safety-related actions required by proper procedure would have to be taken. The result could well be an error in not taking a required action or notcorrecting an erroneous signal caused by the falling person or, e.g. their arm grabbing for support. For example, if the reactor tripped and the falling operator (or other person in the control room)

cut off the feedwater to the steam generators and also caused a spurious water hammer in some control lines, it might be that the spurious signals would isolate the ECCS and RHR systems simultaneously. The operator(s) would have to act very fast with impeccable accuracy to detect and correct all these problems before the steam generators boiled dry, as the reactor pressurizer relief valves would also probably be opening due to overpressure in the primary system. Certainly the operators would need all their wits about them to avoid another Three Mile Island type event. If the other operators had also been using drugs that impaired their abilities, they might not be able to prevent severe damage to the core and release of radioactivity offsite, e.g. through a containment penetration not closed when they were correcting all the other errors to get the reactor cooled again. And of course, drug-taking security guards would be that much less able to cope with terrorists under sections BCDEFand G here'n.

(J) Applicants' security plan and other plans, procedures and policies of CP&L does not take steps sufficient to prevent operators or other personnel from using drugs to stay awake, particularly when they are on ~~k~~rotating shifts that change their time of work once a week or once a month or more often. The US Army has concluded that the use of such drugs can impair decisionmaking ability, leaving persons more panicky and prone to take sudden and risky actions in an emergency. Thus, the use of stimulant drugs ("~~xxxx~~ speed", dexedrine, amphetamine, etc., even caffeine in large amounts) can impair the ability of people to operate and to control the plant safely.

55 It is possible that a deranged fighter plane pilot might fire on the Harris plant with air-to-ground missiles. Many of these missiles used by the military are designed to penetrate hard targets such as tanks, concrete bunkers, etc. Therefore, these missiles would be able to breach the spent fuel building (fuel handling building) and release radioactivity to the environment, e.g. by exploding inside the spent fuel building on a second hit. (Though military action against the Harris plant is also possible with the same consequences as noted here, I am referring to actions by US or foreign military pilots flying with live weapons in peacetime traning or other missions in this area, where there are several air bases -- Myrtle Beach AFB, Seymour Johnson AFB and Cherry Point Naval Air Station ~~xx~~, e.g. -- within short flying times of the Harris plant site. Pilot error or computer error could also cause a missile to take off at the nuclear plant, ~~xxxxxxxx~~ and if it were a precision-guided missile it would probably strike its target directly). Such air-to-ground missiles could also breach containment and damage or destroy the reactor pressure vessel and primary system. Applicants' FSAR, safety analysis and accident analysis are deficient in not addressing such risks and the consequences of missiles hitting the Harris plant or any parts of it, including also the cooling towers, auxiliary building, water lines to and from the cooling towers (though underground, they could be breached or filled by a collapse caused by an explosion on the surface), switchyard and offsite power transmission facilities. This event may be improbable, but surely not below the probability that Applicants claim attends severe core-melt accidents breaching containment, which events will have similar consequences to the public health and safety as a missile attack on the Harris plant by a military pilot gone insane (at least temporarily) or by erroneous firing of a missile at the plant. Class IX accidents including the ones described here must be considered to protect the public.

56 Applicants' Emergency Response plan is deficient because it fails to provide for medical care for members of the public injured by radiation offsite during a nuclear accident, e.g. those exposed to high gamma doses from CS-137 after a core melt with breach of containment. The plan fails to provide for such care on a mobile basis during evacuation, Nor plans to utilize facilities outside a 30 mile radius around the plant in case nearer facilities themselves are contaminated and have to bee evacuated. The plan fails to take into account the medical consequences of a Class IX accident, release of more than 20% of the core inventory (e.g. through a vessel head being thrust through containment as detailed in American Physical Society report of 1975, or from fast fracture of the reactor vessel with parts of the vessel striking containment with enough force to breach it) or provide treatment plans for these medical consequences which include: radiation sickness, iodine-induced injury to the thyroid, burns and inflammation of the respiratory tract, radiation poisoning from ingesting contaminated food or water; and other consequences typical of large radioactive material releases such as the fallout from nuclear bomb explosions. The plan does not assure that enough medical facilities are available or would be available to treat the victims of these medical consequences of a Class IX accident as detailed above or from any other cause, e.g. earthquake, tornado, sabotage, terrorism, common mode failure, ICS failure, ATWS.

57 Applicants' Emergency Response plan (and the State of NC/ FEMA plan) for dealing with the offsite effects of nuclear accidents particularly those releasing radioactive material such as I-131, I-129, I-133, Cs-137, Cs-134, Sr-90, y-90, Rb-90, Kr-85, Kr-87, Xe-133, Pu-239, Pm-147, CO-60, Ni-59, Tc-99 and any other fission products or activation products (e.g. C-14, N-16, Co-60, Nb-94) found in the primary coolant, reactor system, fuel rods, fuel pellets, piping, atmosphere, secondary coolant and/or filters and/or holdup tanks and/or waste processing tanks in liquid, aerosol, gaseous, particulate or solid form outside containment and/or outside the plant site boundary, exclusion zone, or low-population zone is inadequate to protect the health and safety of the public and is deficient and in error because:

A. It doesn't yet exist

B. It doesn't include realistic estimates of the effects of Class IX accidents as required by ~~10xCFRx50x~~ the fact that such an accident has occurred, at TMI-2.

C. The Emergency Planning Zone is not appropriately set under 10 CFR 50 Appendix E (see e.g. at I, note 2 "in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes and jurisdictional boundaries", same language at II.) in that it does not address the specific needs of patients at NC Memorial Hospital (Chapel Hill), Duke Hospital (Durham), Apex hospital (Apex), ~~Rx~~ Wake Medical in Raleigh, Durham County General Hosp. (Durham) who are more likely to be elderly, infants, and with weakened bodily defenses against radiation; does not deal with the specific needs and provide means for evacuation of the inmates at Central Prison (Raleigh), Dix Hospital (Raleigh), and the jails in Durham, Raleigh

and Chapel Hill; does not address or provide for the needs of and evacuation of and shelter for the students of NCCentral University and Duke University in Durham, UNC in Chapel Hill, NC State University, Meredith College, Shaw University, Peace College and other colleges and universities in Raleigh, these being large concentrations of people under about 25 years of age for whom dose commitment from radioactive releases poses greater risks (as detailed, e.g., in Gofman, Radiation and Human Health, e.g. at 285-288 and Chapter 8 generally showing higher levels of cancer induction and loss-of-life-expectancy for those under age 25); does not address or provide for the special protection needs of children under the ages of 6, persons under the age of 18, or pregnant women, all of whom face much greater cancer risk per rem or rad received (see, e.g., Gofman's book cited above, Tables 21 & 22 for those age 0 and up, Chapter 21 pp 707-759 esp. Table 62, Table 66,pp 738-9 on gestational age causing more defects at early part of gestation, also 746, and Ch. 22 on genetic and chromosomal effects), greater risk of mental retardation, disease, genetic defects; does not realistically estimate notification and evacuation times for an accident occurring between midnight and 6 a.m., though evidence shows many kinds of industrial accidents happen on the "graveyard shift" during those times due to impaired reaction and thinking ability of employees -- e.g. TMI-2 accident initiated at 4 a.m., ergo exposing the population to greater risk because they cannot be effectively notified and moved as rapidly during the night hours named; does not provide for effects outside 10 miles or potential maximum radiation effects in the EPZ as far as evacuation is concerned, though W. Ger. Institute for Reactor Safety Report #290 (NRC translation 161) using Rasmussen assumptions on core release (see p. 31, ibid), projects fatal 980-1300 rem radiation doses (see pp 32-33, Table 4.11 on p. 39) to exposed persons 75+ miles from the site (25+ hours plume motion x NC wind speed of 7+ mph (Harris meteorological monitoring

data) vs. German assumed wind speed of 1 M/sec (p.32)(1.e 2 mph) ~~miles per hour~~. Decay of radionuclides in the plume is governed by hours in transport, as is lateral diffusion that increases the width of the plume. The bone doses shown (p.39, ibid) are more severe & also not taken into account for the plan(s).

The ~~same~~ evacuation plan does not address the needs of the Town of Chapel Hill as expressed in the report of its Mayor's Task Force on the Impact of the Shearon Harris plant, does not fund the evacuation and emergency planning for the State and nearby communities, thus imposing costs on them without compensation, and ~~[illegible]~~ failing to recognize their needs as set forth in the Task Force report for independent monitoring, prompt warning, and sufficient means to evacuate the population should that become necessary (all of these due to radioactive releases from the Harris plant).

D. The plan has other specific deficiencies which can only be determined after I have seen a copy of it, particularly in terms of personnel training, manning of agencies needed to assist in emergency response (e.g. city governments, fire departments, Highway Patrol, police, health, hospital emergency rooms, etc) on a 24-hour basis, times and methods of evacuation, means of locating the plume and assessing its dangers (e.g. because there are no pressurized ionization monitors on it and no instruments able to trace its direction off-site in place

The cost of maintaining and creating emergency response plans for the Harris nuclear plant, testing same as required by 10 CFR 50.47 and 10 CFR 50 Appendix E, has been improperly ~~x~~ left out of Applicants' cost-benefit analysis under NEPA and 10 CFR 51.21. Inclusion of these costs would render the plant even more uneconomical than it otherwise is, and are another reason it should not be licensed.

+ the SER for SHNPP

58 Applicants' "safety analysis" is deficient in that it makes no attempt to assess the actual likelihood (numerical probability or range of probabilities) of the named accidents; it uses no data on actual operating experience in the nuclear industry or in other industries or fields where comparable equipment or operations and/or similar equipment or operations are carried out; it fails to consider Class IX accidents either in terms of onsite hazards, or of offsite effects, or of evacuation and emergency response planning, or of costs which such an accident could cause both offsite and onsite, or in terms of the effect of such accidents on the safety-related (as defined by NRC) and "non-safety" equipment such as air lines, power supplies, wiring, instrumentation, switches, relays and other equipment and parts inside containment which are necessary to make safety-related equipment function properly, or which must not malfunction if safety-related equipment is to operate properly (e.g. without interference from spurious control impulses caused, e.g. by human error in maintenance, failure of wiring insulation, of air, water or electricity, erroneous signals from the Integrated Control System; short-circuits; breaks in control air lines, water lines, or electric which then transmit erroneous signals or fail to transmit necessary signals; valves which must not stick open or fail closed, e.g. in the water supplies to each component of the ECCS, and valves controlling flow of borated water to the core). The "safety analysis" further fails to consider the survivability and accuracy of instrumentation in a Class IX accident. Three Mile Island 2 ("TMI") showed that accurate readings of water levels in-core, temperatures in-core, primary system pressure and temperature, and much other data is required for appropriate action to be taken (and erroneous actions to be avoided) by the operators of a pressurized water reactor. Yet there is no analysis and no assurance (based on tests under comparable conditions to a Class IX accident inside containment --

boron to the core in sufficient amounts to bring the reactor under control, resulting in extreme overpressure and loss of primary containment integrity or loss of the reactor vessel head or reactor vessel fracture or steam-generator tube or tube-sheet failure, all of which Class IX accidents listed on this and the preceding page would produce high temperatures and pressures, extreme radiation levels, and possibly other effects such as shrapnel flying in or through the containment (including reactor vessel head and parts of the reactor passing through the containment wall or ceiling), major components falling from supports due to support failure or due to extreme loading produced by sudden failure of the reactor vessel, pipe breaks, etc. producing large thrusts as the primary coolant is released, and other severe conditions) that the instruments and controls and equipment inside containment will be adequate (or adequately protected)so that they can bring the reactor under control or contain the radioactive material inside containment under these Class IX accident conditions in the event that the accident itself does not breach containment. In other words, there is no attempt to show that the instrumentation, controls, transmission of control information and instrument readings, ECCS and other safety -relatedequipment inside containment can continue to function under Class IX accident conditions and bring the accident under control or contain radioactive material inside containment if the Class IX accident is not so severe that it destroys containment integrity, or does not permanently breach containment.

e.g. fast fracture of the reactor vessel with or without thermal shock; loss of the reactor vessel head due to bolt failure or overpressure (from ATWS or otherwise from transients or failure to control pressure in the primary system, e.g. by failure of relief valves, whose behavior is notoriously unpredictable, or by blocking valves being closed at inappropriate times due to human error, valve failure, or being allowed to be closed under the technical specifications or operating activities of the plant when the redundant system(s) or valves serving the same function fail or are unable to operate for lack of power supply, from erroneous signals, from human error, from the effects of corrosion, from spurious computer-generated signals due to, e.g. a fire in or near the computer, water spilled or sprayed on the computer (ICS), coffee or other beverage spilled on the ICS computer or into it or onto its wiring; failures of components in the ICS computer, e.g. logic circuits, supervisory programming errors, other program errors, integrated circuits, transistors, diodes, capacitors, inductors, delay lines and other equipment wearing out or suddenly failing (all these events do happen in computers); spurious signals resulting from wiring acting as an antenna and picking up, e.g. radio, television, and 2-way radio broadcasts; electrical impulses from blasting with explosives in rock near the site; and other causes to be specified in more detail (as all these can be) after discovery); reactor vessel failure caused by any of the spurious signals and other problems just listed; pipe breaks caused by water hammers and/or steam hammers; steam generator tube-sheet failure; simultaneous rupture of 2 or more steam generator tubes (or nearly simultaneous rupture of 2 or more such tubes); small-break or large-break LOCAs accompanied by failure of ECCS; control rod ejection of more than 2 rods; control rod ejection accompanied by failure of borated water system to function to get

58 Many of the members of NC Eastern Municipal Power Agency (NCEMPA #3, or Agency) are small towns of limited financial resources. As such, their ability to finance their share of operating and repair costs is in doubt, as shown, e.g. by the default provisions of Agency's contracts with CP&L, including one in connection with the sale of Agency's bonds that provides for other members of Agency to assume the payments required of parties in default (members of Agency) to the extent of 20% of the total payments required of Agency.

To assure the health and safety of the public, Applicants must be able to afford in a timely manner the costs of repairs, modifications, training, replacement and new parts, equipment, filters, personnel and other things necessary to operate the Harris plant. Such payments may not be able to be made by the small members of NCEMPA (witness the default of some small members of WPPSS) due to their limited financial resources, small populations, small industrial base, and relatively poor populations which cannot afford electric bills raised to any level necessary to cover not only Harris costs but costs of repairs and modifications etc. (as noted above) at Brunswick, which Agency owns about 18% of, as compared to just under 16% of Harris (15.94% of Units 1 and 2). The towns of Hertford, Hobgood, Hookerton, Pikeville, Red Springs, Robersonville, Scotland Neck, Selma, Southport, Ayden, Benson, Belhaven, Clayton, Farmville, Fremont and Hamilton are among such members of Agency as may not be able to afford their share of project operating and repair costs for Harris and Brunswick simultaneously, this imperiling the health and safety of the public and subjecting the public to increased risks.

#59 SHNPP's power output is not needed on the CP&L system because; (1) CP&L load forecasts have declined from 10.1% per year growth prediction in 1973, to 6.6-6.7% per year at the C.P. hearing, to 2.9% per year at the time of the docketing of the ER and FSAR, and will continue to decline based on rising energy efficiency [redacted], competition from other energy sources, inability of nuclear plants to perform or be reliable on peak seasonal demand times in a consistent manner, and other reasons.

The rate of decline in CP&L forecasts can be seen to be 0.85% per year per year 1973-77 and 0.92% per year per year 1977-81 (0.9% per year 1973-81) under the same conditions that will prevail in the future. (Note that CP&L's forecasts assume the economy will recover fully from the current recession and other recessions and continue to grow significantly -- and all such forecasts noted above have made this assumption explicitly or implicitly). At this long-run rate of decline in CP&L load forecasts, zero growth will occur in approximately 1984-85: that is, if load forecasts continue to decline as they have historically since 1973 for CP&L on a basically uniform trend (based on the energy/economy situation prevailing since 1973 and CP&L's estimates as above), CP&L's forecast of long-term demand growth will hit zero or below in 1984 or 1985. 1985 is the projected first date of operation for Harris, and CP&L reserves w/o Harris in 1985 are projected by CP&L at 20.6% (Table 1.3-1, FR, the most current information now available when this contention is filed).

(2) CP&L's baseload capability w/o Harris will be 5300 MW by 1983 and 6000 MW by 1991. NCUC declares & finds (e.g. E-100/32, 1976) [redacted] base capability should be 50% of total power resources (generating capability incl reserves) [redacted] but CP&L peak loads are not projected to reach [redacted] MW (twice 5300) less 20% reserve = 8900 MW before the year 1993, nor 12000

MW less 20% reserve (10000 MW peak load) before the year 1997 even at CP&L's current peak projections, which are too high as shown above in (1). If 1800 MW from Harris were added to these base load capabilities, it would require a peak load of 10,300 MW in 1985-89, 11800 MW in 1990-91, and 13000 MW after 1992 for be utilizing Harris for base load under the NCUC declaration and finding cited above. Such a load (13000 MW) is not projected for the CP&L system, even at CP&L's current forecast which is too high, before the year 2014 when Harris's depreciation life will be over. There is simply no need for Harris as baseload power within its operating and depreciation lifetime as realistically estimated (25 years or less).

(3) CP&L generated over 22 billion KWH with coal in both 1980 and 1981. In 1978, when CP&L's nuclear plants worked (once) at the 70% capacity factor CP&L claims they will (it's been down to the 30% range since), those generated nearly 14 billion KWH. CP&L hydro can supply nearly 1 billion KWH per year, with oil generation making up the difference between actual hydro generation and 1 billion. This total present generating output reasonably expected if CP&L's esiting nukes work as CP&L claims they (and Harris) will) is thus 37 billion KWH/year. Subtract 6% for losses and company use, you have around 35 billion. The output of Mayo 1, scheduled for 1983, net of same 6% loss/co. use, is estimated to be about 3 billion additional KWH by CP&L. This brings us to 38 billion KWH available for customer use w/o Harris (plus 3 billion more in 1991 from Mayo 2). CP&L actual sales in 1981 were 30.5 billion KWH and the 1978-81 growth in sales was at 3% per year or less, compounded, call it 3% linear. At this rate of growth, CP&L has adequate generation

to meet all sales requirements from its own resources through 1990 (1991) without Harris 1 and 2 and without Mayo 2. When Mayo 2 comes on, CP&L will be able to deliver 41 billion KWH/year from its existing plants to its customers, enough for demands thru 1994 at the 1978-81 growth rate in CP&L sales. Moreover, this growth rate is higher than can be expected in the future. CP&L's sales growth rate has been dropping (as estimated by CP&L) just about as fast as its load forecast, and should hit zero by 1986 or earlier if the trends and conditions that cause the decline in CP&L estimates (more efficient use of electricity, alternatives, competition from other energy sources, etc.) continue to act as they have 1973-81. (Yes, this assumes 70% nuclear CF from Brunswick and Robinson in the 1985-94 period. CP&L claims it will achieve same, thru repairs and steam gen. replacement, etc. improving those plants. I can use CP&L's claims to impeach their O.L. application. And if these plants can't achieve 70% C.F. then Harris shouldn't be built anyway, because it is even less likely to achieve 70% DTP C.F. due to additional regulations and TMI refits, which render Harris costs greater than its benefits, as discussed in other separate contentions herein)

#60 SHNPP completion from the current stage of construction violates NEPA in that there is at least one alternative (actually a combination of alternatives) economically and environmentally superior to said completion. Said alternative is a combination of insulation, conservation, efficiency-improvements in the use of electricity for end-uses such as motor drive, heat, cooling, lighting etc, avoiding need for heating and cooling via insulating & reflective roofing, summer shading, vines, trees, shrubs awnings etc., use of thermal storage to flatten daily load variations (making existing CP&L baseload capability of 4600 MW and Mayo 1 at about 700 MW MDC go farther), use of solar heating in winter, gas fuel to provide backup heat for electric heat pumps (instead of electric resistance backup which greatly raises peak demand) with the gas being derived from both conventional sources and renewables such as sewage, biomass, etc.; use of alcohol fuels and biomass for electricity production and heating directly, including alcohol distilled with waste heat from existing CP&L coal-fired power plants and other means. See, e.g. Eddleman testimony and exhibits in NCUC dockets E-100 sub 40, E-2 sub 416, E-44 and E-2 sub 436, in all of which I was recognized as an expert in energy systems and energy conservation; see also testimony of G.G. Reeves, NCUC E-100 sub 35 and M-100 sub 78; Cain Encoder Co. presentation to NCUC, E-100 sub 78, E-100 sub 32; A.B. Lovins, Soft Energy Paths, The Energy Controversy, prefiled testimony before ASLB in this case (1977, Tr. _____), etc.

The cost of said above programs is estimated at $1.1 billion to create over 11 billion KWH on energy savings and over 2300 MW reduction in peak demand on the CP&L system (Eddleman Table 6 and discussion in E-2 sub 416 summarizes same) which is two

Harris units' output at 70% DEP CF (CP&L's unrealistically high assumption) and more than 3 Harris units contribution to peak (generating units require reserves of 20% according to NCUC and CP&L; thus, a 900 MW Harris unit really is only 900/1.20 contribution to peak load, or 750 MWe; 3 x this is 2250 MWe) whereas reductions in peak load (the 2300 MW) require no reserves.

Thus, for the .8 billion dollars still to be expended to complete Harris 1 (assuming construction costs don't rise further), about 2/3 of the above energy conservation, efficiency and other alternatives ("package" or the overall alternative) could be had. For the 1.6 billion more more needed to complete both Harris 1 and 2, the entire alternative package could be bought, even if its price rose about 50%.

And the alternative provides more energy made available for new uses and more aid in meeting peak demand than could Harris land 2 together at optimistic assumptions about their performance.

Further, the alternative package involves lower operating and maintenance costs than Harris, produces no nuclear wastes which must be isolated and properly disposed of to avoid endangering the health and safety of the public, lowers electric bills (compared to what they would otherwise be) instead of raising them, has less effect on the environment, provides far more jobs (jobs per dollar invested in conservation, solar and energy efficiency are 3 or 4 times job per dollar invested in nuclear construction) which jobs are ones requiring less skill than nuclear construction, and thus are more able to reduce unemployment among less-skilled and young workers and such persons seeking jobs in North Carolina, provides the benefits of keeping money in the NC economy (CP&L stock is about

65% owned out-of-state whereas the package would be owned in-state, provides the benefits of energy conservation and less use of energy required to meet needs, provides the benefit of utilizing renewable resources, the benefit of allowing people and companies and building owners to more fully control their energy costs and to participate in meeting their energy needs, reduces the pollution burden on local water treatment facilities and supplies (by using methane derived from wastes which would otherwise have to be treated using purchased electricity(and/or oxygen) and which would be oxidized in streams and rivers that provide water to other users including city water systems), reduces the impact of nuclear waste transportation and reprocessing on the environment by reducing the amount of waste produced, reduces or eliminates the sociological and socioeconomic impact of psychological stress associated with and caused by the operation of nuclear power plants, provides particular benefits socioeconomically to the poor and those on fixed incomes (whose energy bills are a major portion of available funds they have, who have to choose now between heating and medication, or between heating and food, many of whom live in electrically-heated housing, owned or rented) who would have energy improvements in their dwellings financed by the package, and thus provides far more environmental benefits (including jobs, income to workers on the jobs, keeping money in the local economy) and lower costs, and will do more in supplying electrical energy for new needs and in meeting peak demand, than completion of the Harris project from where it now stands can do.

The alternative package being envidently superior under NEPA to Harris completion, I move the Board to (1) suspend Harris construction ASAP and (2) schedule an expedited hearing on this contention.

6/A Applicants and NRC Staff have ~~xx~~ not included in their cost-benefit analysis under NEPA nor in their FSAR, accurate and up-to-date data for the health effects, genetic damage, and other damaging effects (e.g. lung diseases, susceptibility to allergy, asthma, pneumonia, chest colds, influenza, and other viral and bacterial diseases) of radon emissions from the nuclear fuel cycle for the Harris units 1 and 2 they still claim they will build.

Due to the 80,000 year halflife of thorium-230, parent of Rn-222 once-removed (via ~~Ra~~ radium-226), these health effects will continue over at least the next 1.6 million years (20 half-lives of Th-230). Mining of fuel for the Harris plants will not occur if the plants do not get a license to operate, or if they do not operate. The health effects of Rn-222 resulting from mining fuel for 2 900 MWe PWRs operating at from 40% to Applicants' claim of 70% capacity factor based on design electrical rating, for from 10 to 40 years (Applicants use 25 years as the depreciation life; no commercial PWR of the size of the Harris units is more than 10 years old in the USA to date, and many of these are springing too many steam tube leaks at ages of 10 or less, e.g. Robinson 2, Oconee 1,2, and 3, Surry ~~3~~ 1 and ~~4~~ 2, Turkey Point 3 and 4) must be included in any decision allowing the Harris plants to operate, since all these health effects over the next 1.6 million years can be avoided simply by not issuing an operating license for Harris.

The output estimates above give a range of 3.6 to 25.2 GWe-years of output per Harris reactor. Gofman (Radiation and Human Health, p. ~~51~~ 469) shows that there are 450 radon-induced deaths per GWe-year, plus about 55,000 times this amount ($.1 \times 4.51 \times 10^9 / 0.7 * 115,000$) from uranium left in tailings piles. The result is a minimum 3240 deaths from Harris, up to 22,500 deaths, from Th-230 alone, and 5000 times these values or more when the effect of uranium left in tailings piles is included. See also C. Kepford, In Response to the de minimus theory and ALAB-509, NRC Dockets 50-320,277,278, Feb. 19, 1979 before ASLAB for other estimates of radon long-run health effects.

#61B The long-term health effects of Radon-222, U-238, U-234 (incl equilibrium w/ Th 230, Ra-226 + Rn-222 eventually; also see Table 8 ibid + Table 10 of NRC Reg Guide 3.51) and other nuclides in Table S-3 and Table 2.13 of NUREG-0859 on the population and environment, including genetic damage, have not been adequately assessed in the SEP and FS and FR and FSAR, including insufficient and ~~xxxxxxxx~~ wrong analysis, "discounting" of future deaths and genetic damage, ignoring synergistic effects e.g. between deday products of radon and tobacco smoke and chemical carcinogens including synthetic chemicals, and other errors.

These effects must be correctly assessed to weigh in the operating license stage environmental assessment under NEPA and to protect the health and safety of the public under AEA.

The work of Gofman (e.g. Radiation + Human Health, 1981 at pp 450-464 etc) KZ Morgan, + others shows how the above health effects are underestimated + how to mitigate their damage effects (of S-3 effluents radiological) + correctly estimate same.

#62 Applicants have not taken appropriate measures (including campaigns to stop people from smoking) to reduce the impact on health + environment (e.g. lung cancer) from Table S-3 via means suggested by K.Z. Morgan, et al, such as chemically removing + isolating hazardous nuclides from uranium tailings, isolating the tailings, preventing wind access to mill tailings from uranium milling, etc. (also including the ALARA criteria of Appendix B of NUREG-0859)

63 Applicants' Emergency Response Plan is deficient because it fails to provide for medical care for members of the public injured by radiation offsite during a nuclear accident, e.g. those exposed to high gamma doses from CS-137 after a core melt with breach of containment. The plan fails to provide for such care on a mobile basis during evacuation, and plans to utilize facilities outside a 30 mile radius around the plant in case nearer facilities themselves are contaminated and have to bee evacuated. The plan fails to take into account the medical consequences of a Class IX or lesser accident, release of more than 20% of the core inventory (e.g. through a vessel head being thrust through containment as detailed in American Physical Society report of 1975, or from fast fracture of the reactor vessel with parts of the vessel striking containment with enough force to breach it) or provide treatment plans for these medical consequences which include: radiation sickness, iodine-induced injury to the thyroid, burns and inflammation of the respiratory tract, radiation poisoning from ingesting contaminated food or water; and other consequences typical of large radioactive material releases such as the fallout from nuclear bomb explosions. The plan does not assure that enough medical facilities are available or would be available to treat the victims of these medical consequences of a Class IX accident as detailed above or from any other cause, e.g. earthquake, tornado, sabotage, terrorism, common mode failure, ICS failure, ATWS.

#64 Added environmental effects of spent fuel transport + storage at SHNPP from Brunswick, Robinson or other reactors (directly or thru Brunswick or Robinson) include the potential for increased damage due to a loss-of-coolant or melting of the spent fuel pool at Harris (or both pools, if both are built). According to NUREG -0020 vol 6 #1 pp 3-2 and 3-3 (Appendix), both Robinson 2 and Brunswick will fill their present spent fuel pools by 1986. Moreover, in order to retain ability to unload the full core at Robinson (necessary, e.g. for steam generator replacement or attempts to anneal the Robinson reactor vessel with its RT_{ndt} or embrittlement temperature of 290° F), more shipments will have to be made from Robinson to Brunswick, or Robinson get an approval to its pending request to increase pool capacity by 105 assemblies). By 1986, according to the numbers in NUREG-0020, about 2000 BWR and over 500 PWR assemblies of spent fuel will be in the Brunswick and Robinson pools, and thus may be transferred to Harris at or before 1986.(only low performance at Brunswick and Robinson can prevent this number of spent nuclear fuel assemblies from being created at those plants by then..) Bringing this fuel to harris imposes not only the risks of transporting all that fuel but also:

(a) storage of nuclear fuel during construction increases the risk it will be sabotaged;

(b) the potential damage from a spent fuel pool LOCA at Harris, induced by plane crash, terrorism or sabotage is greatly magnified by the presence of up to 2500 Robinson

and Brunswick spent fuel elements there.

(c) the additional handling and transport of said spent fuel multiplies the probability of a fuel-handling accident at Harris by at least 2, and also increases the probability of fuel-handling accidents at Brunswick and Robinson.

(d) the risk and probability of transport accidents for spent fuel are increased by transshipment to Harris -- the more miles you travel with nuclear fuel, the more wrecks are possible and the more other accidents can occur to the fuel in transit. The analysis of section 3.8 of the FR is inadequate in that without basis it claims that the environmental impacts of such shipments will be within those set forth in Summary Table S-4 which clearly states that it is for "One Light-Water Cooled Nuclear Power Reactor" and note 4 to said table (evidently what CP&L relies on) says the accident risk is not capable of being estimated. Sandia Laboratories has published a study (probably more than 1, too) on nuclear waste transport accidents indicating that one involving loss of coolant (e.g. from striking bridge supports or abutments; from ripping in a sideswipe accident with a bus, car, bx truck, power pole, bridge support, guardrail, light pole, phone pole; from puncture; from crushing the heat sink of the cooling system; from cask flexing if it lands at an angle after a rollover accident; etc) could promptly kill up to 2000 persons with more delayed cancers, etc.

And it is obvious that the more fuel that is moved, the greater the risk; further, the radiological impact of spent fuel shipment in Table S-4 is not covered in footnote 4; thus there is no basis for excluding it under NEPA and AEA.

(e) the risks of releasing the 2 million curies (74 billion million radioactive disintegrations per second) in one spent fuel shipment of 0.5 metric ton are underestimated by Applicants and NRC because they do not take account of the new information in the Sandia study referred to in (d) above and in other studies, use no empirical data on waste shipment accidents and frequency of accidents to similar trucks carrying loads of similar dimensions and weight, and do not sufficiently protect the integrity of the cask and coolant in the event of an accident.

(f) There is undue risk to the health and safety of the public since pressure valves on the casks used for spent fuel transport are likely to unseat (e.g. the 4 removed from service by GE in 1981) or the plastic components of such valves could and would melt in a fire less severe than the test basis for spent fuel casks. Open the valve and out comes the coolant -- radioactive contamination-- followed by fuel overheating & melting, Cs-137 boiling.

(g) the spent fuel transport casks to be used by Applicants for such shipments have never been tested physically, including tests while pressurized, tests involving a heat source equivalent to the spent fuel inside them. Use of such untested casks unduly risks public health and safety from radiation releases and accident consequences up to those given in (d) above.

(h) NRC's computer testing of casks has not been verified by actual tests of casks now used, resulting in the risks and problems described in (g) above including accidents.

(i) NRC calculations of the impact of an irradiated fuel accident in any heavily populated area exclude the first 1/4 mile from the accident, and obvious flaw which leads to great underestimation of health effects since radiation

levels within 1/4 mile will affect emergency response personnel and any other persons within such distance. This mistake by NRC must be corrected to comply with AEA -- NRC's rules and regulations may not conflict with the Act's "safety first" mandate as the courts have interpreted it.

(j) Applicants have failed to prove that emergency response personnel including fire departments and police along the route(s) used for spent fuel transport to and from Harris have the equipment, training and personnel to deal with all credible accidents involving spent fuel in transit, including cask loss of coolant, loss of heat sink, and the other accidents described in (a), (b) & (d) and above. Such capability and equipment and personnel and training is necessary to protect the health and safety of the public and of the emergency response personnel, numbers of whom are volunteer firefighters (ordinary citizens, not fulltime emergency response, police or fire personnel).

(k) Applicants have failed to prove there will be adequate radiological monitoring of the spent fuel shipments to and from Harris and the routes along which such shipments are made, to assure the health and safety of the public, e.g. in the event of a leaking cask (caused, e.g. by inadequate-strength cask -- most existing ones have this problem -- sagging under its own weight, flexing under stresses of acceleration and turning and deceleration in transit, going over bumps or potholes, tire blowout, or accident as described above in this grouping of contentions).

(Most of the above is documented in the work of Dr Marvin Resnikoff et al, most recently the CEP spent fuel study of 1982 (Council on Economic Priorities, New York NY)

#65 Because Daniel International, CP&L's prime contractor on the Harris project, has a history of building defective base mats and containments (e.g. Callaway, Wolf Creek, Farley) a complete ultrasonic re-examination of the containment and basem mat, able to detect voids over 1 inch in size (any dimension over 1") therein, or another type of examination with similar capabilities to detect voids, is necessary before Harris 1 is allowed to operate. Otherwise the voids could become (thru cracking from thermal stress, concrete aging, or external impact) paths for radioactivity to leak from containment at unforeseeable times, (including during rad releases inside containment) e.g. from reactor or primary system relief valves after a reactor trip or feedwater trip.

#66 Applicants CP&L and NCEMPA do not have the financial resources to finance a cleanup of a nuclear accident like THree Mile Island, which can reasonably be expected to cost over $1 billion to do since TMI is estimated to cost a billion dollars or more to clean up (Unit 2) and the job isn't done yet.

Absent a cleanup (essentially restoring the plant to operability or early-decommissioning it or decontaminating its site completely per decommissioning standards for residual radiation levels) the health and safety of the public will be endangered by the continuing presence of radionuclides e.g. those listed on contentions 37 & 29&30(including I-129) above and all other nuclides resulting from such accident, which will be retained at the SHNPP site with the threat of their rapid escape and the certainty of some slow escape of them into the local environment (as at TMI now).

Also, such cleanup should be required to remove all radioactive contamination of the unit(s) or spent fuel pool(s) involved in the accident(s) from the site.

Section 3 of Wells Eddleman 1st Supplement to petition to intervene

#67 There is no assured disposal site to isolate the low-level radioactive wastes produced by normal operation at Harris from the environment and the public until said waste, which includes highly toxic(radiotoxic) and long-lived nuclear wastes such as Sr-90, Cs-137 and Pu-239, has decayed to virtually zero levels of radioactivity and radiotoxicity. The lack of such an assured disposal site, plus CP&L's style of operation at Brunswick which leads that plant to have unusually high generation of low-level waste both compared to the capacity of the plant and to its electrical output, which style of operating may well prevail at Harris, means that the lack of such an assured disposal site for low-level Harris rad waste endangers the health and safety of the public under AEA and needs to be considered in the environmental balance under NEPA, this condition having changed since the CP stage (and CP FES) due to the refusal of SC, NV and WA states to continue to accept unlimited amounts of low-level radioactive wastes; and by the enactment by Congress of laws allowing states to form compacts for low-level radwaste disposal and to exclude wastes such as SHNPP low-level radioactive wastes from states not members of such compacts. Sea disposal is not assured because EPA's proposed rule to allow disposal of low-level radioactive wastes in the oceans has not been enacted, and if enacted may be overturned by legal action or act of Congress.

#68 There is no assurance of secure disposal of high-level radioactive wastes from SHNPP including spent fuel; parts of the reactor and primary system including activation products such as Co-60, Nb-94, Ni-59 and others;

and for unusable but radioactive steam generators, used filters, and other wastes (e.g. ion-exchange resins with radwaste) from SHNPP operation containing high amounts and/or high levels of radioactivity from fission products and/or transuranic elements and/or actinides and/or activation products. While some steam generators have been accepted by DOE for tests, it is unlikely DOE will still be accepting them for that purpose by the time SHNPP's can be expected to wear out (30 days to 15 years after commencement of commercial operation at full power, based on the experience of McGuire 1, Almaraz and Ringhals (as examples) for the lower figure, and CP&L's H.B. Robinson 2 (as an example) for the higher figure. Surry and Turkey Point, 4 other steam generator complete replacements in Westinghouse reactors, were at from 6 to 8 years approximately of commercial operation when they required it. The amount and total radiotoxicity of all radioisotopes in other divisions of SHNPP's high level waste output, such as filters and resins, or such as the spent fuel, is even higher and a more serious threat to the public health and safety over both the short-run (less than 30 years), the medium-term until Cs-137 and Sr-90 have run 20 halflives or more (600-1000 years) and the long term (e.g. 20 to 30 halflives of Put-239 is 480,000 to 720,000 years). Considering the calculation by strongly pro-nuclear prof. Bernard Cohen that the radiotoxicity/biohazard from spent fuel takes 11 million years to decay to at or below the radiotoxicity/biohazard of the parent ore before ~~the nuclear fuel cycle~~ it was mined, the effects of such high-level wastes are very long-term. Likewise, they involve strong radioactivity (alpha beta and gamma in quantities sufficientto deliver lethal doses in

a matter of minutes to anyone directly exposed to them, e.g. at a distance of 1 meter or less unshielded.

Since we know that the best means of containment for chemicals fail at empirically establishable rates, and that storage tanks and other storage systems for high-level wastes have leaked, and that any storage system adopted for high-level wastes will degrade over time, and that "In the DOE waste management programs, there has, as yet, been little emphasis on studies of basic corrosion mechanisms under simulated geological conditions" (much less actual geological conditions, see USGS report 0779) (quote from NUREG/CR-2317 BNL-NUREG-51449 Vol 1 Nos 1-2, Container Assessment--Corrosion Study of HLW (High Level Waste) Container Materials, Quarterly Progress Report April-June 1981 at p. 1), the lack of assured storage for high-level wastes (considering their long-term radiotoxicity and health effects as demonstrated by research of K.Z. Morgan, J. Gofman and others as cited in contentions above, e.g. Bertell and Bross, Mancuso, Stewart, Kneale, et al) and the effects of its escape into the environment must be considered, at least on a probabilistic basis or as a risk or unintended or undesirable effect under NEPA, and as such wastes' existence, storage, and the lack of assured long-term isolation from the environment at the present time (and the string of broken promises and missed deadlines for "solving" the high-level waste isolation problem that AEC, ERDA, DOE and others have compiled, which sheds light on the likelihood of meeting now-estimated deadlines for establishing such an assured-long-term storage for high level radioactive wastes such as those from SHNPP) and their health effects must be considered under NEPA and AEA.

#69 The lack of research to date on corrosion of planned high-level radioactive waste isolation methods and systems, as demonstrated e.g. at p.1 of NUREG/CR-2317 (Ahn,Lee&Soo, Brookhaven National Lab Dept of Nuclear Energy, published December 1981, as cited in more detail in the previous contention) in and of itself requires a reassessment of the SHNPP operating license. Further Production of such extraordinarily dangerous material as spent fuel from Harris should not be allowed until basic research including the above-referenced studies on corrosion of waste disposal systems has progressed far enough to reasonably assure, on the basis of actual tests and research, not projections or estimates or confident statements not supported by solid scientific and engineering data on the actual materials, sites and conditions to be involved in long-term isolation of spent fuel wastes from the environment and the public, (including decay heat, mix of fission products, chemical nature of the various radionuclides involved, concentrations of same, materials of containment, dimensions and ~~re~~ forms and treatment and fabrication of same), that the high-level spent fuel radioactive wastes to be generated by SHNPP if it were licensed to operate could be safely disposed of protecting the public health and safety and avoiding undue risk to human life and genetic integrity and to the gene pool of other species(total terrestrial gene pool, from which humans derive such benefits as drugs and chemicals synthesized by micro-organisms and plants, atmospheric oxygen in concentrations required for human life, aid from microorganisms in digesting our food and producing vitamins, etc.)

#70 SHNPP is not in compliance with (and/or Applicants have not solved the problems described in) IE information notice number 81-20 of 7/13/81 on failures of electrical penetration assemblies, thus providing an additional means for radioactive material to be released to the atmosphere, or into the spent fuel (fuel handling) building, auxiliary building or other parts of SHNPP from which it can escape into the atmosphere and case also ground and water contamination. Applicants must show that their containment penetration assemblies as installed will not fail under the test conditions, or other heat, pressure, radiation, moisture etc. conditions to be expected in a Class IX accident inside containment, e.g. at or above the 10^7 rads and other conditions shown in FSAR 3.11.0-5 and -6 and other parts of FSAR 3.11, which are Class VIII conditions. Lack of such assurance imperils the public health and safety e.g. by allowing release to the atmosphere of radionuclides vented to containment by primary system pressure relief after an ordinary turbine trip, reactor trip or loss of feedwater, or in a "fairly frequent" overcooling event where much more radioactivity might be released inside containment due to failure of the pressure vessel from thermal shock or fast fracture as described, e.g. by D.L. Basdekas 6-29-82 presentation to NRC Commissioners (and attachments) & by Sir Alan Cottrell as described in "How Safe is Nuclear Energy?"

71 The temperature qualification of Ebasco-purchased equipment for SHNPP is not sufficient to meet the demands of a Class IX accident, which has become an event one must allow for and plan for in nuclear plant operating licensing now (thanks to TMI-2) since CP Stage SER + ES + the CP was issued. According to FSAR 3.11.1-1 and -2, predicted temperatures for such equipment (not further specified there)(other than as some Ebasco purchased equipment) under accident conditions therein (Class VIII, design basis accidents) were higher than the qualification temperatures of said equipment. Without providing sufficient documentation and tests to establish the assertion, the FSAR continues at the same pages that the critical components of such were analyzed and in every case would not themselves overheat at the accident temperatures for the piece(s) of equipment they're in (not otherwise specified there) "in every case". Such analysis must be provided, with documentation of methodology of calculation and testing, qualification of the critical components, proof that the equipment involved can function for its safety-related uses and required functions in an emergency of the Class VIII or Class IX level, not only for the Class VIII conditions referred to in the FSAR, but also in Class IX conditions as now required, specifying the equipment, components, functions and analysis and assumptions used in providing such proof. Otherwise, the components' ability to function is left in doubt, and the health and safety of the public is not adequately protected, due to lack of verification that this Ebasco purchased safety-related equipment can perform its safety functions under Class VIII and Class IX accident conditions.

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72 Certain safety related equipment for SHNPP as specified in FSAR Table 3.11.0-4 (pp 3.11.0-20 through 23 of FSAR), including stem mounted limit switches, RHR pump motor, Boric Acid Transfer Pump Motor, Centrifugal Charging Pump Motor, Limitorque Valve Motor Operators, ASCO Valve Solenoid Operators (all on p.3.11.0-23 where it is asserted that these pieces of equipment do not need to perform their functions to shut down the plant -- though that is not clear for the valve motor and valve solenoid operators in light of TMI-2, and certainly the RHR is needed to keep the plant shut down safely after many kinds of shutdowns and accidents, and the Boric Acid Transfer Pump would absolutely be required for safety during an ATWS to which Harris is vulnerable per WCAP_____) + e.g. contention — below incorporated herein by reference

and the nuclear instrumentation system (p.3.11.0-22) which likewise is required to function for safe resolution of a TMI-type or other ClassIX potential event, were manufactured to IEEE-323-1971 which came out before the question of qualifying safety related electrical equipment to function under accident conditions was resolved by IEEE (the answer : yes, it should be so qualified to function under accident conditions). As Appendix 3.11A shows, numbers of important relief valves and other equipment are now qualified per the IEEE-323-1971 standard). Although asterisks indicate there's more info in the TMI Appendix, they don't say where and I can't locate any direct reference to IEEE-323-1974, just a few statements about using "safety Grade" equipment. I do find, however, at page TMI-78, that the reactor head venting system "will be limited to the makeup capacity of one high head charging pump" in the event of failure -- the charging pump powered

by an IEEE-323-1971 motor noted above which the FSAR claims is not needed for safety in the event of an accident (e.g. when gases might have to be vented from the reactor vessel head due, e.g. to excess radiolysis of water in the core, water-zircaloy reaction, steam voids forming in the core, etc.).

The above situation in [redacted] its specifics is in violation of 10 CFR 50 Appendix A, General Design Criterion 4, requiring that safety systems be qualified to function during accidents. (I include my definition of "accident" here also)(this is just for emphasis that I mean it my way as well as the NRC's way)

Absent a comprehensive review for Harris such as the Safety Evaluation for the Environmental Qualification of Safety-Related Electrical Equipment at Three Mile Island Unit 1 (published report 24 March 1981, finding that the electrical equipment for at least the: ECCS, Core Flood, Containment Spray, Auxiliary Feedwater, Nuclear Service Water, Containment Isolation, Decay Heat Removal, and Containment Cooling Systems as well as the CRDM, Boron Injection, Reactor Coolant Pumps and Feedwater systems (each including the controls and power supplies and motors and wiring needed to make it perform its safety-related functions in the event of an accident), SHNPP should not be licensed to operate. It would be an unqualified plant with serious deficiencies that would compound an accident by impairing and preventing the function of safety-related equipment under accident conditions.

#73 The Harris SER, FSAR and ACRS report do not establish, based on accurate study, inspection and evidence, that SHNPP is fully in compliance with NUREG-0660, NUREG-0737 and other updates and parts of the TMI Action Plan. This Plan and all its parts are based on information new after the CP Stage reports (ES, PSAR) and CP issuance and hearing (the TMI#2 accident and its aftermath and inquiries into its causes and how to prevent more nuclear accidents). The TMI Appendix to the FSAR, and other documents from CP&L, are full of statements that "we will comply" or words to that effect (see, e.g. pp TMI-2, TMI-17, item 9 "pressure instrument will be provided later"; training and procedures "will be accomplished". But there has to be proof that CP&L has done all this, based on independent investigation. The info of contentions 3, 31, + 40 above is incorporated here by reference to show indep. investigation is necessary because neither CP&L's nor NRC staff's ability to assure compliance is established, nor that they will assure it if they have the ability. or SHNPP should not be licensed because, absent compliance with the full TMI Action Plan, the health and safety of the public is not assured in that the lessons learned at TMI have not been applied to making SHNPP safer. Such noncompliance also violates ALARA requirements for staff at SHNPP and radioactive releases to the public by not acting to prevent them under the TMI Action Plan. (10 CFR 50.34a and 50.36a - ALARA)

#74 NRC is unable to protect the health and safety of the public under AEA and the environment under NEPA adequately in this proceeding because NRC is not following the recommendations of the Kemeny (President's Commission) and Rogovin (Special Inquiry Group) investigations and others to change its basic attitudes toward safety, put safety first instead of giving priority to issuing licenses rapidly, and to expand and assist the role of intervenors in the licensing process to improve the assurances of safety and environmental soundness of NRC-licensed projects, and NRC Staff has tendencies (1) to underestimate the seriousness of safety-related problems in nuclear plants and (2) to rationalize continued operation + construction of nuclear plants whenever possible

#75 Applicants have not shown that the events and conditions described in IE Information Notices 81-03 and 81-21 will not transpire at Harris (and that similar conditions will not occur) to prevent access of the Harris plant to its heat sink, which could cause serious cooling failures, even a core melt, due to inability to cool the plant after a sudden shutdown, + certainly heavy core damage + Zr-H_2O reaction if cooling were cut off. In desperation, operators might vent containment (a radiological release) under such circumstances, in hope of avoiding even more serious releases if containment wasn't vented. e.g. by failure of baffles and tubes in the main condensers due to corrosion, pressure changes, sudden pressure changes resulting from repeated trips and transients, water chemistry changes, etc. Unusual numbers of trips and shutdowns could result from trying to control SHNPP with its defectively designed steam generators, if operation at 75% or 100% power range is attempted, precipitating more tube leaks in the S.G.s and requiring more frequent shutdowns. In another manner, the winter 1981-82 operating experience at Oconee, and the spring-summer 1981 operating experience at CP&L's Robinson 2 nuclear plant, show how in nuclear plants of about 10 years of age, repeated steam generator tube leaks caused without the additional design defects of SHNPP's Westinghouse model D steam generators (S.G.s) can and do result in repeated plant shutdowns even after extensive inspections. Corrosive effects of biocides and other chemicals added to cooling tower water must also be considered, and the possibility that one or more species of clam, oyster or other marine growth (e.g. barnacle) will prove resistant to said biocides and thus able to grow and live in the SHNPP condensers (being brought there, e.g., on a pair of pants worn wading at the beach by a person who also works around the cooling towers, or by a saboteur, or from the Harris lake in makeup water, having been introduced to any stream feeding that lake by means similar to the preceding) and thus grow + create debris to foul, block the condensers and prevent plant access to its ultimate heat sink, with serious safety consequences as above

#76 The SER is deficient in that it does not explain how the following problem can and will be prevented at SHNPP:
The fixed hydrogen recombiners at SHNPP (2 per containment) are electrically powered (FSAR 6.2.5) but have to be started manually on a hydrogen reading of over 3% (6.2.5.5.1 p 6.2.5-11) At p. TMI 52 and 53, it is stated that hydrogen monitors reading 0 to 10% will be installed inside containment at Harris. But both the power to the recombiners and the cables to power and take readings from the monitors for hydrogen come through cables and wiring insulated with polyethylene (PE) and/or jacketed with polyvinyl chloride (PVC). (These cables and wires may also be amont the wiring now on-site that is only made to IEEE-323-1971 standard and is thus unqualified for functioning under Class VIII or Class IX accident conditions.) As the work of K. Gillen and R. Clough of Sandia Laboratories has shown, long-term, low-level gamma radiation doses such as these cables will receive during SHNPP operation, degrades PVC and PE by breaking bonds in them and thus rendering them more subject to oxidation which in turn embrittles the electrical cable insulation and jacketing at a much faster rate than would a large sudden radiation dose. This effect will be even more pronounced at the lower dose rates (than Gillen & Clough's tests) of much normal operation at SHNPP.
Embrittled cables and wiring can short out, particularly since they will also be subject to vibration from nearby pumps, motors operating, and from shocks as in earthquakes, valve openings and closings (steam and water hammers), etc. Such wiring may be grouped in cable trays or conduits where its brittle nature cannot readily be detected or inspected,

and be able to short out more readily because of the presence of other cables around it witth degraded, embrittled, cracked or peeling insulation or jacketing. The long-term radiation doses resulting, e.g. from a small break accident where the reactor is brought under control but much coolant has escaped, as at Ginna or TMI-2, to these cables and wiring could result in more rapid deterioration of same while cleanup progresses (or while it is still too radioactive for people to stay in containment long enough to complete cleanup prior to restarting the reactor), would further embrittle, oxidize and deteriorate such cable insulation and jackets (PVC and PE).

Then, if another small-break accident (e.g. from breaks in one or more steam generator tubes, which could well be a recurring problem, based on the nature of corrosion -- it doesn't quit -- and experience to date e.g. at Robinson, TMI-1, Oconee 1 2 and 3, Ginna and other plants) occurred and hydrogen was generated, it is possible that the power or readings from the hydrogen monitors in containment at SHNPP would fail due to shorted-out wiring or degraded wires or cables, or that inaccurate readings would be transmitted due to said causes, preventing operators from manually starting the hydrogen recombiners, and/or the power and/or controls to the recombiners (75 KW each) could fail, preventing the recombiners from working even though instrumentation might indicate they were energized. As a result of these situations, hydrogen levels inside containment might continue to rise with operators either unaware of it or unable to do anything about it (high radiation levels would preclude venting containment), and a short circuit, running pump motor or hot piping or the reactor's heat might ignite the H_2,

creating a pressure pulse that reached up to the force needed to burst containment penetration seals, many of which are made of materials also subject to radiation-induced degradation, such as epoxy which can revert to its original constituents (2 liquids) suddenly if enough heat and pressure energy is supplied to it, thus releasing massive quantities of radioactivity to the atmosphere directly or through auxiliary buildings. Obviously, many variations on the above scenario are possible and Applicants need to show that none of them are likely or able to release radioactivity to the atmosphere and endanger the health and safety of the public.

477 Applicants have not shown that radiation-induced deterioration and embrittlement of insulation and jacketing of wires and cables, and failure and shorting out and changes in resistivity and other electrical properties of the wires or cables due to any combination of the degraded insulation, nearby presence of water or steam, presence of nearby cables and electric fields, or any of the situations and circumstances of wires and cables described in the above contention (incorporated herein by reference, but not here referring to hydrogen recombiners and hydrogen buildup) which are all credible accident conditions under 10 CFR 50 Appendix A Criterion 4 (including LOCAs thereunder) will not prevent the safe operation and shutdown capability under Crit and Criterion 17 (esp last paragraph), e.g. by the failure of power supply, electrical control or other needed electricity (e.g. to power and transmit readings from instruments needed to tell operators what they need to know to actuate proper safety related equipment or to avoid human errors which compound accidents, e.g. turning off feedwater or ECCS too soon after a SCRAM) to safety-related equipment including the ECCS pumps, reactor coolant pumps, control rod drive mechanisms, borated water pumps

relief valves and reactor vessel vents, and feedwater pumps and isolation valves for steam generators and steam lines (primary and secondary system isolation valves). To cite a nearly maximum accident possibly caused in this manner, suppose that any condition requiring a SCRAM occurs (a relatively frequent event at PWRs like Harris). If a vibration, or assumulated deterioration of wiring insulation or cable insulation (e.g. from as simple a cause as a person bumping into it with a mop handle while cleaning, e.g. during refueling, the mop handle and hitting the cable being behind the person so they don't even know what they hit or that it cracked the cable insulation) has caused the control rod drives to be inoperative, you then have ATWS. If further shocks from valves closing and opening (or pumps running overspeed to try to cool the core, or at normal speeds) then results in a short circuit, inadequate signal transmission path, or other failure to be able to activate the boron injection system, pressures in the reactor will rapidly rise because there is now no means to bring the core under control exxcept its negative thermal reactivity coefficient, which won't stop pressures of 3000 to 7000 PSI as stated by NRC re ATWS from being achieved, which pressures could readily blow off the reactor vessel head, propelling it through containment, and exposing essentially the full core inventory of radioisotopes to the environment, propelling much of them out behind the vessel head (like the gas from gunpowder behind a cannonball) with the reactor vessel serving as a mortar for the projectiles the head and parts of the core. See APS, 1975, at p. S1, Supplement, study of reactor safety

Another scenario: vibrations from even a mild earthquake could induce the reactor trip and all of the cable shorts needed to cause the above horrifying accident.

Contentions —, — + — above on elec equipment + insulation embrittlement are incorporated herein by reference.

#78 Applicants' design + planning of SHNPP is deficient because it lacks means to avoid a complete (or virtually complete) loss of control power such as occurred at Crystal River, Oconee, Oyster Creek or other operating reactors in the past for periods up to 15 minutes. This issue is particularly applicable to Harris due to its outdated design made before this loss-of-power problem was considered credible or frequent enough to design features to prevent it, beyond having the 2 redundant power supplies per 10 CFR50 supplied from offsite A/C and onsite (diesel generator) A/C and onsite D/C (including electrical components, design, positioning of cable trays) and vulnerability in accident conditions to short-circuits due to (a) use of IEEE-323-1971 equipment + cable + wiring not qualified under accident conditions and (b) vulnerability to radiation-induced embrittlement + oxidation of PVC + polyethylene cable or wiring insulation, in accident or normal operation conditions. Short circuits can cause circuit breakers or protective relays to cut off power to the involved control, instrumentation + power-supply circuits, knocking out or isolating each power supply in turn as it kicks in after the initial cut-off (isolation) due to short-circuit. Applicants' design + construction of Harris, including wiring, also fails to comply with the NUREG on this matter (Task A-44 Station Blackout) + its requirements to be issued on or about June 30, 1983 (p. 36, NUREG-0606 Vol 4 #1 Feb 19, 1982)

79 Applicants' "accident analysis" is deficient in that it does not consider possible loss of access to the plant's external heat sink, which could occur through collapse or breakage of water lines to & from, or [redacted] collapse of the cooling towers--e.g. during an earthquake (Research-Cottrell, builders of the Harris cooling towers, received their contract to do so within months after a cooling tower they had under construction in W.Va. collapsed, killing 51 people) or due to faulty design, faulty construction (e.g. going too fast as in the collapse of the Research Cottrell tower referred to previously), failure to properly cure concrete in the towers, tower collapse caused by a tornado or tornadoes -- in each of these cooling tower collapse events, debris from the collapsed tower could well: block the flow of water to the tower's former site directly, by mass of rubble above it, or by rubble or debris or both penetracting or collapsing the water line from the condenser to the cooling tower (or to both towers, from an earthquake-induced collapse or a failure with a common cause in both towers such as a tornado or tornadoes, hurricane winds and debris, or similarly defective design, construction, reinforcement, concrete curing), ~~or in other ways~~

An earthquake could also sever the large pipes that move coolant ~~to~~ from the condenser to cooling towers and back, or cause the collapse of such pipes, especially if a heavy truck (e.g. one carrying a lead nuclear waste cask, or new equipment for repairs or modifications) was passing over the pipes or parked above them at the time of the earthquake. CP&L's failure to reinforce where roads pass over these pipes has been documented. Loss of access to the cooling towers, or broken or collapsed pipes, as described above, could cause inability to remove core decay heat, leading to Class IX nuclear accident

#80 The mixing models and dispersion models for radioactive gas, liquid and other radiological releases from SHNPP under 10 CFR part 20 are deficient in that they assume more complete mixing and dispersion of such radionuclides released than will actually take place, take insufficient account of rainout of such a release plume in a small area (rain precipitating the radionuclides in the plume) and thus do not assure that releases comply with 10 CFR 20. 106 and the protection of the public health & safety, including holding individual doses below 25 rem whole body + thyroid doses below 300 rem in an accident, + below 10^{-3} of these values in normal operation.

#81 Applicants', the State's, FEMA's and other emergency response plans as approved for SHNPP are deficient because they have not been tested under 10 CFR 50.47 and Appendix E to part 50, fullscale and with the regular partial tests as specified therein, with results that show that such plans will adequately protect the health and safety of the public during a Class IX accident at SHNPP, such as ATWS or the reactor vessel head blowing through containment as described in American Physical Society's report on nuclear accident risks of 1975.

#82 Applicants' pre-operational environmental radiation monitoring program for SHNPP and surrounding areas is deficient in that (1) it has insufficient sampling points and numbers of samples taken over time to establish background radiation levels and radionuclide concentrations (including those from nuclear weapon fallout and other nuclear plants already operating) on a statistically valid and reliable basis throughout the area of concern, e.g. within 10 miles for emergency response (20 miles as requested by Citizens' Task Force to NRC, PRM-50-31 of 1x9882) and within 50 miles for EPZ .

(2) It does not establish specific concentrations of radionuclides in the air with the same time of pressure-ionization or continuous reading monitors that will be used (see contentions 1 and 2 above) for post-operational monitoring and advising emergency response personnel of radiological releases and what and how much radioactive material is being released.

(3) does not monitor algae and other lower forms of life, e.g. in the Harris lake, which are the first step in most aquatic food chains, and does not do sufficient monitoring of such algae to establish statistically reliable baseline concentration data on the radionuclide concentrations (specific nuclides and concentrations for all fission products, transuranics and activation products to be produced by SHNPP, e.g. see source term FSAR 11, EP 3, etc) so that contamination from SHNPP will be detectable readily, to give early warning of radioactive contamination from SHNPP to ensure the health and safety of the public.

(4) does not assure that the monitors, test samples and other things tested have not been "seeded" or contaminated accidentally or deliberately with radionuclides, e.g. from transportation on US 1 and US 64 (leaks, accidental releases), from nearby medical and research facilities (research triangle park, etc.) (Duke and UNC and NCCU and NCCentral universities, etc.) or their radioactive wastes, in order to show higher than actual background radiation levels near the site. Accidental contamination e.g. transport of such nuclides on shoes or clothing of sampling personnel who visit hospitals, labs and SHNPP rad sampling sites. Deliberate, e.g. seeding with radionuclides from low-level waste by CP&L.

#83 The environmental impacts of the chlorine, hydrazine biocides and other effluents from cooling tower blowdown on fish and other benthic & aquatic life in the SHNPP lake and the Cape Fear River have been insufficiently considered in that: (The wastes and amounts are listed in ER Table 3.6.2-1)

(A) overflow from CP&L's waste water treatment operation on-site may occur during rainstorms and will occur during floods:

(B) the sensitivity of fish and benthic and aquatic life forms of all species present in the reservoir and in the Cape Fear to the specific chemicals discharged in colling tower blowdown and to their reaction products in the lake and river environment (including interaction of chlorine from SHNPP with toxic chemicals and other wastes in the Cape Fear River, resulting e.g. from industrial polluters upstream on the Haw River as far as Greensboro NC, which Applicants have not proved will be cleaned up so as to prevent or absolutely minimize such interaction) has not been established on the basis of reliable scientific research.

(C) the biological concentration of the cooling tower blowdown chemicals and their reaction products in life forms in the food chain in the reservoir and in the Cape Fear, including creation of carcinogenic chlorinated organics, has not been adequately researched or documented.

#84 The ES is deficient in not taking into account the carcinogenic + toxic effects of chemicals from (R.B. cooling tower blowdown) at at Harris, including those formed by interaction of the chemicals to be released per ES Table 3.6.2-1 or connections to it, with other chemical pollutants (eg. organic chemicals, dyes, etc.) in the Cape Fear River. Cities downstream

draw their drinking water from the Cape Fear. EPA has identified over 100 carcinogenic & toxic chemicals (many of them chlorinated) as priority pollutants. Many of these exist in the Cape Fear. CP&L's discharges will include some of these by reaction between chlorine and ammonia and hydrazine, e.g. forming NH_2Cl, $N_2H_2Cl_2$ $NHCl_2$ and NCL_3, and others as shown in Table 3.6.2-1 but not explicitly identified there as to chemical species, + by Further reaction between Cl_2, NH_3, hydrazine and chemicals in the Cape Fear. Human ingestion of such chemicals in drinking water will increase the risk of cancer and other diseases to the population drinking water from the Cape Fear, especially due to interaction of CP&L's chlorine releases with NH_3, N_2H_4, and the other organic pollutants present in the Cape Fear, for example converting phenol-based dye chemicals into chlorinated biphenyls and triphenyls, and reaction between NH_3, CL_2, hydrazine and phenolics.

(B) The carcinogenic and toxic effects in (A) above will be multiplied by the biological concentration of the carcinogenic & toxic chemicals above, including metals released per TR Table 3.6.2-1 in the benthic and aquatic life of the Harris lake and the Cape Fear river, and in the fishing areas off the coast of NC where Cape Fear water flows and mixes. Fat-soluble toxins and carcinogens are of great concern among these chemicals because they are stored, not metabolized, and thus more concentrated at each step of the food chain(s) involved. Eventually these chemicals, at concentrations CP&L has not proved to be safe, will exist in fish, oysters, clams, shrimp and other food species (oysters and clams strain pollutants as well as food species from the water) eaten by persons, including fish from the Harris Lake, Cape Fear, and ocean off NC(as noted above), and oysters, clams, mussels

and other food species taken from the Harris lake, the Cape Fear, and from oyster and clam beds near the mouth of the Cape Fear. These impacts have not been adequately researched or established by CP&L and have not been taken into account, based on new data such as EPA's studies of carcinogens in drinking water and studies of bioconcentration of carcinogens and toxic chemicals performed since the construction permit and CP FS were issued and the CP hearings and order were done. CP&L has thus not adequately protected the public health from its chemical discharges and their "risks ... undesirable and unintended ...effects"(such as cancer, metal poisoning, and creation of new carcinogens by interaction of CP&L's Chlorine and hydrazine with chemical pollutants already in the Cape Fear River) as required under NEPA. (The chemical reaction mechanisms and/or forms and types of chemicals reacting to form these additional carcinogens and pollutants herein, from (A) above, are incorporated here by reference.)

#85 CP&L has failed to take appropriate measures to prevent or minimize fish kills from the causes discussed below. Contention 86 is incorporated herein by reference for its information

#86 The FS's consideration of fish kills due to hot water discharge into SHNPP reservoir (lake) is inadequate as (1) the upper lethal temperature limits at which significant fish mortality occurs have not been established for important fish species (EP 5.1.3-2, amendment 1) (2) the time for which any of the EP 2.2.0 important fish species (or others found in the Harris reservoir (lake)) can tolerate the high temperatures in the discharge mixing zone is not established on the basis of experimental data, not have periods such species of fish (individuals of those species) are likely to spend in the mixing zone been established

by actual study or experiment on those same species in lakes like the SHNPP reservoir.

(3) average, not peak, mixing zone temperatures have been used in the analysis of fish sensitivity to temperature in the mixing zone. Actually, the peak temperature that can be expected during the time and period established by research per (2) above should be used in projecting the probability and numerical occurrences of fish kills from Harris cooling tower blowdown by temperature. Further, the addition of heat by cooling tower blowdown above the maximum temperatures of over 31^{C} recorded in the area (EP Ref. 5.1.3-5) or the actual highest temperature recorded in the reservoir without cooling tower blowdown, needs to be the basis in establishing the temperatures in the mixing zone and the areas over which these maximum temperatures can be expected to extend for the time and periods as calculated above in this (3) and (2).

(4) the additional toxic synergistic effects of the presence of chlorine, hydrazine, ammonia, and other chemicals in addition to elevated temperatures per (3) above in cooling tower blowdown on fish kills in the mixing zone must be considered on a conservative basis. The sensitivity of important fish species per EP 2.2.0 and other fish species found in the reservoir must be established accurately to these combinations of chemical and temperature conditions to be expected.

(5) The original FES did not consider the above accurately because then SHNPP was going to be once-through cooling with no cooling towers, thus cooling tower blowdown chemicals and the mixing zone were very different from the current plant, and plant setup. These changes must be addressed (as set forth above, e.g.) in the striking of the environmental balance under NEPA for SHNPP operating license issuance.

#87 The ES insufficiently considers the psychological stress to be induced by the operation of the Harris nuclear plant in the population surrounding it, including those served by CP&L and those served by other electric utilities e.g. Duke Power or NCEMPA members. Such stress is caused, e.g, by: Knowledge that nuclear power plant operations routinely release radioactive material into the environment which would not be there absent the nuclear plant's operation; knowledge of nuclear accidents at Three Mile Island, Tsuruga (Japan), Ginna (NY), Brown's Ferry (Ala), and radiation releases therefrom and risks of more serious accidents during those accidents and from SHNPP; knowledge of CP&L's operating problems including poor performance and radiation releases at Brunswick, radiation over-exposure at Robinson, the large fines NRC has repeatedly levied against CP&L for nuclear violations and deficiencies; knowledge that they are (as CP&L/NCEMPA member ratepayers or owners of EMC coops) being forced to pay for the Harris plant without any effective personal choice in the matter, of (as Duke Power or other electric utility customer) are receiving no benefits from the Harris plant but are subject to its risks including radioactive "normal" emissions, nuclear accidents, paying costs of emergency response planning, training and testing (to the extent not paid by CP&L); knowledge or belief that risks of radiation to humans, their genes and the environment has been underestimated, falsely downgraded, or covered up, e.g. by AEC, DOE, government nuclear laboratories, nuclear industry including EEI and CP&L, Westinghouse, Ebasco, Daniel International and others; knowledge or belief that CP&L operations are deficient and/or incompetent to protect the

#87 The ES insufficiently considers the psychological stress to be induced by the operation of the Harris nuclear plant in the population surrounding it, including those served by CP&L and those served by other electric utilities e.g. Duke Power or NCEMPA members. Such stress is caused, e.g, by: Knowledge that nuclear power plant operations routinely release radioactive material into the environment which would not be there absent the nuclear plant's operation; knowledge of nuclear accidents at Three Mile Island, Tsuruga (Japan), Ginna (NY), Brown's Ferry (Ala), and radiation releases therefrom and risks of more serious accidents during those accidents and from SHNPP; knowledge of CP&L's operating problems including poor performance and radiation releases at Brunswick, radiation over-exposure at Robinson, the large fines NRC has repeatedly levied against CP&L for nuclear violations and deficiencies; knowledge that they are (as CP&L/NCEMPA member ratepayers or owners of EMC coops) being forced to pay for the Harris plant without any effective personal choice in the matter, or (as Duke Power or other electric utility customer) are receiving no benefits from the Harris plant but are subject to its risks including radioactive "normal" emissions, nuclear accidents, paying costs of emergency response planning, training and testing (to the extent not paid by CP&L); knowledge or belief that risks of radiation to humans, their genes and the environment has been underestimated, falsely downgraded, or covered up, e.g. by AEC, DOE, government nuclear laboratories, nuclear industry including EEI and CP&L, Westinghouse, Ebasco, Daniel International and others; knowledge or belief that CP&L operations are deficient and/or incompetent to protect the

public health and safety; and normal human concerns for a good environment to raise children in, for the health of one's family, descendants and loved ones, fear of dangerous materials such as the radioactive contents of a nuclear plant core, fear of genetic damage to oneself or one's descendants, for the quality and healthfulness of eating one's food grown near the SHNPP (including food a person grows for her/himself and family and friends to consume, and local fish and game from near SHNPP), concern about whether one can be evacuated in a nuclear accident, especially for those in prisons, hospitals or who are disabled or who otherwise are not able to control their own transport away from ~~SHNPP~~ Harris in an accident, or who do not have personal vehicles to use in an evacuation, fear of the long-term consequences of environmental pollution including radioactive wastes from the Harris plant; feelings of powerlessness, anger, frustration, irritation, fear, stress, strain, pain, headaches, stomach and digestive upset, apathy, resignation, disgust, mistrust and upset, tension, nervousness, or any of these, induced by the above knowledge, beliefs and considerations. "exposure to the feared object" as advocated by a psychiatrist who visited Raleigh and criticized "nuclear phobia", is no cure for the above stress which may only be compounded by utility and NRC reassurances or claims that the basis of such stress may not be realistic, due to public distrust of power company statements (e.g. "our rates are not expected to rise faster than inflation" or "there was no danger to the public" in a nuclear accident or incident) and of NRC's truthfulness and disinterestedness and ability to protect the public from nuclear accidents and nuclear risks.

CP&L and NRC staff have not proved that the extent of such stress around the Harris plant site, in the areas as described above within 50 miles of SHNPP (for the purposes of this hearing, or beyond that "zone of interest" if the Board will allow consideration of psychological stress at greater distances, e.g. fear for loved ones living near SHNPP, especially those who do not believe it is dangerous and therefore might not evacuate promptly enough in the event of a nuclear accident there) is small enough to exclude from the environmental balance required at the O.L. stage under NEPA.

Much of the information and events leading to the development of this psychological stress (e.g. TMI accident, Ginna accident, Tsuruga Accident, new research and reports on radiation health risks, ~~xx~~ investigations of General Public Utilities (and its owned subsidiaries)' performance and truthfulness, and NRC's performance, at the accident at TMI-2 and in failing to prevent same, irritation ~~at~~ CP&L rate increases (caused in part by CWIP for Harris 1 and ~~x~~2), data on which the accuracy of past predictions of radiation safety is judged to be wrong (e.g. cancer studies of fallout victims at St. George, Utah; Mancuso et al study of low-level radiation health effects); additional fines against CP&L; investigation(s) of CP&L management and nuclear performance, e.g. by Jacobstein for NCUC Public Staff and Cresap McCormick & Paget for NC Utilities Commission; news accounts of nuclear industry problems, risks and cover-ups (e.g. GPU et al failure to promptly tell NRC & public that fuel rods had failed in TMI-2 core) ~~promptly~~ has become available only since the CP FES and CP hearing and license were completed, and are thus new information under 10 CFR 51.21. See also PANE v. NRC, DC Circuit Court of Appeals, 1982, slip opinion.

Such psychological stress is ~~xxxix~~ a consequence, though perhaps an "unintended or undesirable consequence," of SHNPP operation under NEPA. Absent SHNPP operation, such stress should be considerably reduced. Thus, psychological stress as described above needs to be balanced in the cost-benefit determination at the O.L. stage.

#88 The ES is deficient in that it considers as benefits the use of the Harris plant lake and surrounding area for recreation, hunting and fishing without considering the following: (A) that such areas should be within the exclusion area under 10 CFR 100.11(a) and (b) and thus no such use of them should be allowed, due to risk of radiation exposure to persons in such area (whole body and thyroid) during bad Class IX accidents -- accidents worse than considered in reviewing plant operations, which now include Class IX per 45 FR 40101. Thus there will be no benefits therefrom.

(B) Even if, contrary to (A) above and the protection of the health and safety of the public thereby, the above uses of areas in the LPZ are allowed (or if such use is allowed in any part of the LPZ without referenced to the matters in (A) above on establishing the exclusion area), the ES fails to consider the costs of establishing adequate transport, warning, medical treatment and other emergency response facilities, means, plans and the hiring of trained personnel to carry them out, which are all necessary to assure the prompt evacuation and/or other protection of the health and safety of those engaged in hunting, fishing and recreation within the LPZ in the event of a nuclear accident at Harris. Since wind speeds of 7 mph are common at the SHNPP site, evacuation of those within 2 miles would be necessary within 15-20 minutes of the beginning of a release, and those within 7 miles within 1 hour of such beginning, those within 10 miles within 1½ hours, etc. CP&L's emergency response plans fail to assure that all persons engaged in recreation in the LPZ will receive timely warning under 10 CFR 50.47 + 50.72 of releases from SHNPP and adequate emergency response including that described above to protect their health and safety and transport them out before they are exposed to the plume of radiation release.

#89 The ES takes insufficient account of the destruction of wildlife habitat which has already been caused by the construction of SHNPP, and does not include the cost of restoring same habitat and its natural, scenic, social, cultural and recreational values (including making it safe to eat game and fish from the area of SHNPP) once SHNPP's operating life is over and SHNPP has been decommissioned. The above factors must weigh in the operating license stage environmental review to correct errors in past assessments and because, if Harris does not operate, the costs of restoration of the site as described above will be considerably less because no radioactive wastes will have to be removed, such wastes resulting from fission, activation and neutron capture during SHNPP operations. The lack of actual decommissioning experience on a large PWR like Harris (with the possible exception of TMI-2) means that uncertainties in assurances that such site restoration will be carried out adequate to restore the above uses for wildlife and the general public (preserving health and safety) need to be considered in striking the O.L. stage cost-benefit balance under NEPA. There are environmental benefits, as noted above, in not operating SHNPP, in that the open areas created by construction will exist, with their benefits, while the radioactive wastes with their costs, will not.

#90 The ES is deficient in not including the cost of measures to restore the SHNPP units 3 and 4 reactor site holes, and to prevent them from becoming mosquito breeding areas and hazards from persons falling into them, both during SHNPP operation and after SHNPP has been decommissioned. These are costs resulting from a change since the CP & CP FES (CP&L canning Units 3 and 4 of SHNPP in December 1981).

#91 Radiation monitoring of SHNPP site has been insufficient in that the State of NC's closest monitoring site for radiation to SHNPP is at Raleigh NC where there is one monitor (FR 6.3-1), and independent monitoring of radiation levels there is needed to assure the health and safety of the public because of CP&L's actions at Brunswick e.g. dumping radioactive wastes in local landfills, moving at least one radiation monitor when it gave too high a reading (sampling location changed for SR-90). CP&L Vice President P. Howe (who signed Amendment 2 to CP&L's EP under oath) is a member of the NC Radiation Protection Commission and is or should be aware of the inadequate monitoring program of nuclear plant sites in NC (as described in contention 1 above, the facts thereof being incorporated here by reference) by the State of NC Radiation Protection Section. Yet Howe and CP&L have not acted to remedy this situation or to get adequate resources and staff for RPS to carry out its monitoring duties which will only be increased by the operating of SHNPP. Since budget cuts in NC are likely, the capability of RPS to independently monitor radiation levels around SHNPP may be further reduced. CP&L has failed to take action to assure that RPS can independently monitor the Harris site both before and during operation of SHNPP, thus not adequately protecting the health and safety of the public (and displaying lack of concern that such protection exist, though it is required by law and CP&L official Howe is involved in overseeing it thru RPC's oversight of RPS's activities including independent monitoring of nuclear plant sites for radioactivity).

Section 4 of Supplement (Contentions) to Wells Eddleman Petition to Intervene 50-440/441 OL

#92 The Harris ECCS, as described in FSAR Table 6.3.2-1, is not able to deliver sufficient cooling water to the core in the event of extreme overpressure accidents (e.g. ATWS) or of accidents in which, by stud bolt failure, overpressure, stud bolt fracture from exposure to boron ~~xxx~~ & borated chemicals, the reactor vessel head comes loose or leaks or is taken off or blown off entirely. The vessel in these latter events would be like a pressure cooker with its lid ajar or completely off (respectively) and would allow ~~x~~ MUCH more water & steam to escape than the ECCS can provide in makeup, resulting in insufficient core cooling, possible meltdown, and probable continuing release of remaining core radioactive material (e.g. as vapor, particles etc from overheated core parts or accidental criticality in a collapsed core, in any accident which releases primary coolant to atmosphere or external environment on ground or in liquids, e.g. through a pipe break, relief valve being open, reactor vessel lid integrity & closure not being complete (as above, e.g.) through an open valve, vent, penetration, hole (e.g. from vessel head or parts of it going through; or from cracks and voids in containment) or the main equipment hatch or other access including doors to the containment. Such performance is insufficient to protect the health and safety of the public.

#93 The SER is deficient in not analyzing thoroughly the potential of accidental criticality in a collapsed, damaged or degraded core, or parts thereof, such as would result from loss of core cooling for periods of 20 minuts to several hours (e.g. as happened at TMI-2, or worse circumstances), from failure of core supports, from earthquakes, or from explosion outside the reactor vessel (e.g. placed by a saboteur or terrorist) at its wall or nearby. Such criticality could lead to additional

radioactive releases, melt control rods and poison rods or shatter poison rods or leach boron out of them at high temperature, which are restraining or preventing the rest of the core (whether damaged or not in the rest of it) from also going critical, thus causing additional criticality in the core with worse results, cause overheating in the core, confuse operators about plant conditions during a Class IX accident, leading them to commit errors such as turning on or increasing ECCS flow as temperature rises due to such criticality (cooler water increases the reactivity of the Harris core) thus increasing the severity of the criticality and the accident, force operating and repair personnel out (due to high radiation) of the containment area where their work was necessary to prevent radiation releases after a core-damage accident that could lead to such criticality (e.g. by shifting of core debris under vibration, water flow, etc), perhaps months or years after the initial accident (the TMI-2 core has not yet been examined 3 plus years after its accident), and otherwise cause radioactive material to escape by the means given in this and the above contentions (the above c. is incorporated here by reference) or other means, or cause additional radioactive material to so escape, endangering the health and safety of the public.

#94 According to p.7 of the Application herein, CP&L's capital stock and retained earnings totaled approximately $1,792,180,000 at 9/30/81. CP&L's capital stock and retained earnings are insufficient to ensure cleanup of a major nuclear accident (Class IX, TMI-2 equivalent or worse) at the Harris nuclear plant. Without such cleanup the health and safety of the public will be at risk. NCEMPA owns less than 16% of Harris, so even under their "take or pay" contracts with CP&L and NCEMPA they cannot provide the necessary funds for such a cleanup, as their contribution is restricted by those same contracts to their share (i.e. less than 16%) of the costs. One has only to look at the continuing wrangling over who pays the cost of the TMI-2 cleanup to see that this question is not resolved.

#95 The ES insufficiently considers the cost of property insurance on SHNPP, which CP&L has sought to increase, but not updated the cost of accurately as of yet, which accurate costs for SHNPP property insurance have not been included in the environmental balance struck for the O.L. Stage under NEPA, and which results from events (TMI-2 accident, CP&L's seeking to increase insurance) which occurred after the C.P. FES and CP license issued per 10 CFR 51.21.

#96 Safety-related electrical cable at SHNPP includes CPE (a polyethylene vulnerable to more rapid deterioration from long-term radiation exposure as shown e.g. by Gillen & Clough of Sandia Laboratories)(but no PVC as NRC now informs me, unless info showing PVC is used in such calbe & wiring later becomes available). Such safety-related (Class 1, etc.)

electrical cable and wiring includes insulating materials such as neoprene, Hypalon, glass braid, and CPE for which the degree of deterioration under normal operating and under accident conditions (including Class IX) is insufficiently established; failure of this type of cable and wiring could prevent the functioning of ~~lxxxxxi~~ safety equipment at SHNPP, or by increased resistance, changed capacitance or inductance, or other change in electrical properties of the wiring or cables, cause misreading of vital safety instrumentation, erroneous signals to safety-related equipment, and other communication and information transfer, and power, failures which could cause common-mode failures (e.g. from broken insulation cracked off by the same shock) and ATWS, power excursion and other accidents at SHNPP which endanger the health and safety of the public and which might occur so rapidly that the existing emergency response plan could not go into effect, nor the necessary determinations and notifications could not be made, before significant quantitites of radioactive material reach the public, e.g. due to ATWS and reactor vessel head blown through the containment followed by much of the core radioactive contents (APS, 1975).

#97 The Emergency Response Plan for SHNPP does not take sufficient account of, or provide means to deal with, accidents that very rapidly build to the general emergency level, and which can or do result in large amounts of radioactive material escaping the site, e.g. through a reactor building penetration or vent that fails to close due to an electrical failure, e.g. of cable insulation, control logic, short circuit, wiring overheating, a mechanical failure (blocked air line or failed closer device motor. Such plans are

necessary to protect the health and safety of the public because with its outdated reactor vessel and equipment that has had to be redesigned repeatedly due to the long interval between commitment to build SHNPP (and the NSSS order and other safety-related equipment being ordered and purchased) and estimated operation date, much new information coming to light in the interim period necessitating repeated design changes to assure the safety and health of the public, SHNPP lacks the equipment qualification and quality assurance/quality control (due also to CP&L's failures and deficiencies in QA/QC) to assure that such rapidly-escalating accidents as described herein and in the above contention (incorporated here by reference) do not occur. Thus the Emergency Response Plan must prepare sufficiently to promptly notify plant and emergency response personnel of such events (including instrumentation to detect same which is not vulnerable to the failures outlined above) and plans to protect the public adequately from the results of these rapid radiological release events at SHNPP. Such measures may have to include expansion of the exclusion area and LPZ, relocation of nearby homes and population centers, and other appropriate measures to keep people out of the zone of high risk from such accidents (per 10 CFR 100.11, esp. at note 1 to subsec. (a) thereof) to protect and assure their health and safety.

#98 Applicant CP&L should be required to provide, out of the 22000 acres it purchased for the SHNPP site, wildlife habitat to replace that destroyed by the construction of the plant, some of the best in the area according to NC Wildlife personnel. Such compensatory creation of new wildlife habitat to replace other wildlife habitat destroyed is required under NEPA and the environmental policy of the United States (see, e.g. Cane Creek Dam project, Orange County, NC, EIS under wildlife habitat)

#99 The updating and testing of Applicants', State of NC's and FEMA's emergency plans for SHNPP are deficient in not providing for keeping the plan sufficiently up-to-date (e.g. identifying the location of all day care centers, residences of all disabled persons, residences of all persons without transportation (or other places to which those without transportation can come from their residences to be transported without receiving radiation exposure in coming there), schools and workplaces and universities and educational institutions where there will be numbers of persons requiring transportation, prisons and hospitals where not only transportation but additional medical care and guards will have to be provided during evacuation) & location & identity and means to reach to evacuate the EPZ around SHNPP emergency response personnel necessary or take other appropriate emergency response measures in a timely, efficient and effective manner, under 10 CFR 50.54(t) and 10 CFR 50 Appendix E IV G.

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#101 CP&L's Training Schedule for reactor operators, supervisors and others (SROs and ROs) does not provide sufficient staff for SHNPP control room operations to meet the minimum shift crew requirements per FSAR and NRC rules (number and licenses to fill positions) necessary to operate the plant on a continuous basis. Therefore CP&L's training program is deficient, its planning is poor, and CP&L's ability to protect the public health and safety in nuclear operations is in doubt. Without at least a minimum crew at all times, consisting of supervisor, foremen, senior readtor control operators and operators, appropriately qualified by SRO or RO license as necessary, SHNPP cannot be operated safely, per 10 CFR 55 and 10 CFR 50.54 (i)(j)(k)(l)(m)

#102 CP&L's in-containment radiological monitors as described in FSAR 13.3.7.3.1.2 (p. 13.3.7-5) and in the TMI Appendix to the FSAR, can only read up to the radiation levels expected in design basis accidents for locations inside containment. Therefore the SER and design of SHNPP are deficient in that the radiological monitors in containment are not able to read radiation levels resulting from a Class IX accident (e.g. a core melt) at the highest levels to be expected in such an accident. CP&L has failed to take relatively simple steps (e.g. providing a second equivalent monitor shielded in lead to go with each monitor per the above, thus having a detection range much higher than the unshielded or less shielded monitor.

#103 The on-site counting laboratory at SHNPP is not equipped with sufficient shielding from radiation and shielding for samples to ensure that samples of coolant (primary)

and other samples which must be analyzed quickly to provide information to emergency response personnel, plant personnel who declare and determine the level of emergency at the SHNPP (unusual event, alert, site or general; or whatever levels are specified in the current emergency plan) [redacted] to protect the health and safety of the public, can be analyzed rapidly enough (e.g. without being sent offsite for analysis at the Harris T&E Center counting laboratory or elsewhere) to provide said information soon enough to activate the emergency response plan and evacuate persons requiring evacuation in the event of a Class IX accident under 10 CFR 50 Appendix E IV(C) and (D)(3)

100 The SHNPP Emergency Plan and planning of applicants, the State of NC, FEMA et al is deficient in that it does not provide the means of decontaminating farmland and homes around SHNPP in the event of a Class IX accident per 10 CFR 50.54(s)(1), (s)(3) and (t) and 10 CFR 50.47 (b)(13) and other subsections of §50.47, and Appendix E theretox The environmental report (EP 2.1.3 and Table 2.1.3-2) shows that the agricultural production within 50 miles of SHNPP is substantial, and that population (E.P. 2.1.2 and Tables 2X.1.2-1 through 2.1.2-5) in the area is also numerous; the emergency plans and planning cited above are deficient in not adequately providing for such decontamination of food and living places of large numbers of people after a Class IX accident (or "Class X" event per contentions above which are incorporated here by reference. The class X part of this, including the above except the 4 underlined words, stands as a separate contention 100B.

#104 The ES and cost-benefit balance it strikes are deficient in not considering, at minimum, the uncertainties in decommissioning costs for Harris Units 1 and 2 due to the fact that no PWR of such size has been decommissioned yet (with the possible exception of Three Mile Island Unit 2, an accident being the cause). Decommissioning costs considered under NEPA should also include additional costs likely if radiation exposure standards for workers continue to be lowered, e.g. to the 500 millirem per year limit advocated by BEIR chairman Dr. Edward Radford. And Decommissioning costs should include the cost of providing secure storage for the parts of the plant too radioactive to be disposed of except as nuclear (radioactive) wastes at the time of decommissioning, costs of assuring that SHNPP will not release radionuclides to the environment or expose persons to radiation during any interval between the end of operation and complete decommissioning. That any such costs may be paid by the taxpayers, federal government, etc instead of ratepayers (who are now being charged by CP&L for decommissioning of Robinson and Brunswick reactors) is not relevant under NEPA. Costs are costs and must be considered in the environmental balance.

New information on weaknesses of radwaste containment systems planned, leaks from low-level waste sites (e.g. Maxey Flats, West Valley), and new data on radiation protection of workers (e.g. that which Dr. Radford bases his views on) acquired since the C.P. stage of this proceeding and the C.P. FES require such reconsideration under NEPA and 10 CFR 51.21.

#105 The exclusion area and Low Population Zone (LPZ) for Harris are improperly established under 10 CFR 100.11 (entire) in the light of new and additional information including the crediblity now of Class IX accidents more severe than formerly believed credible (see, e.g. 45 FR 40101), the accident at TMI and studies of its consequences and particularly of its radioiodine releases by Takeshi Seo, C. Van Middlesworth, B. Molholt and others, including Gordon MacLeod, which information was not available at the time the CP was issued or when the LPZ and exclusion area were established (or wasn't considered properly when they were). FSAR 6.2.1-1 and 2 states that the accident used to set the LPZ and exclusion area boundaries (and, ergo, distance to boundary of nearest population center, e.g. Cary, Apex, New Hill) was a "design basis accident" (CLASS VIII). But note 1 to 10 CFR 100.11(a) says that these distances and boundaries must be "based upon a major accident ...that would result in potential hazards not exceeded by those from any accident considered credible. Such accidents have generally been assumed to result in a substantial meltdown of the core with subsequent release of appreciable quantities of fission products." While the basis document for these calculations dates from 1962 (Tech. Info. Document 14844, 3/23/62), new data such as the TMI accident, Tsuruga Japan release, 45 FR 40101 etc above studies has come to light since the CP Stage of this proceeding. Moreover, even before TMI (and consideration of such and worse accidents as having credibility, e.g. 45 FR 40101), the ASLB ruled in 1974 that they have distinguished between the "design basis accidents and the even more severe hypothetical

accident required to be postulated by 10 CFR ~~PART~~ 100 for the purpose of evaluating site suitability." Farley, 7 AEC 98, 103 (1974). And 10 CFR Part 50 Appendix D distinguished between the "design basis events" (Class 8 accidents) that are sequences of specific failures, and the "more severe" Class 9 accidents which can melt the core. The design basis events of SHNPP and other Westinghouse PWRs to date (as filed in PSARs and FSARs) have not been core melts or partial core melts per 10 CFR 100.11(a) footnote 1. Table 13.2 of the 1977 SHNPP SER confirms this as the DBA doses therein are less than those in 10 CFR 100.11

The fact that TMI-2's accident exceeded its design basis also excludes such an accident (Class 8) from being used for determining the 10 CFR Part 100 distances to the boundaries of the exclusion area, LPZ and nearest population center. TMI-2 did not have its containment isolated (closed) for several hours into the accident, where its design basis accident (Maximum hypothetical accident) & ~~XXXXX~~ TID 14844 (on cit) does. And TMI-2 released more Xe-133 than per its design basis accident.

On the basis of events and data such as the above since the CP was issued, the limits of the exclusion area, low population zone and limit of the edge (boundary) of the nearest population center need to be re-established for SHNPP on the basis of a Class IX accident more severe than any other, and the zoning codes of Wake, Chatham, Lee, Harnett and possibly Durham and other counties, as municipalities near SHNPP need to be revised to exclude homebuilding in the re-established LPZ and where such building (including apartments, hospitals, schools, etc.) would bring a population center within the 1 & 1/3 times LPZ boundary distance of SHNPP.

#106 The health and safety of the public with respect to the safe construction and operation of the Harris nuclear plant is not assured because the NRC Staff, for the reasons set forth in contentions 74 (p.180) and 31 (p.96) above which are incorporated herein by reference for such reasons, is unable to cope with the failures of management and quality assurance and quality control of CP&L, including those in contentions 3,15,33, 40,41-42,43-44,56,57,65,71, 72,73,76,77,78,79,80,81,82,88,91,94,96,97,99,100,101,102, 103,and 105 above(incorporated by reference herein) which show that CP&L by management, staffing, actions, and lack of: appropriate and timely planning, design, installation and modification of equipment (e.g. rad monitoring, safety-related equipment), training, development of procedures,and otherwise making sufficient accomplishments and efforts to assure the protection of the public health and safety; and thus, because NRC Staff, for the reasons cited and incorporated by reference above, is unable to cope with CP&L's inadequacies (as described above) to protect the health and safety of the public, including CP&L's history of QA/QC failures at Brunswick (where CP&L assumed much more responsibility for construction management and QA/QC, see NRC 1979 remand hearing, testimony of J.A.Jones of CP&L, and cross examination, tr. _____) and continuing through Harris (e.g. "approved" defective welds on pipe supports and hangers discovered 1981-82). Thus, NRC Staff weaknesses, attitudes, deficiencies and problems (not all of which are NRC Staff's fault, and no offense intended to invidiual staff) plus CP&L's weaknesses as detailed above including incorporations by reference, combine to create a lack of assurance of proper construction & operation of Harris to protect the public health and safety.

#107 The SER for SHNPP is deficient in that it does not provide valid assurance that SHNPP as built will be able to operate safely and within applicable NRC rules, IEEE and ASME codes, and other applicable requirements for operation, ~~including~~ without undue risk to the public health and safety resulting from any of the following under 12 NRC 683 (~~Byron~~) at 685-686, and where when the following problems which apply to SHNPP have not been adequately resolved:

(A) Water Hammers; (B) Westinghouse Steam Generator Tube Integrity (lack of it)(defective design SG's at Harris, like McGuire's and Summer's, included here); (C) Reactor Vessel Materials Toughness (assuring same for Harris' 1971-ASME-Code pressurve vessels, coolant pumps, etc); (D) Fracture toughness of Steam Generator and Reactor Coolant Pump Supports (irradiation and frequent startups/shutdowns caused by defective steam generators or other management deficiencies of CP&L including failure to make appropriate modifications & repairs to assure safe & reliable operation, as at Brunswick); (E) Seismic design criteria (including collapse of cooling towers and piping thereto, shaking loose embrittled wiring and power insulation, and common-mode failures e.g. in the CRDM wiring which NRC does not have available to it on-site or otherwise but, & which I have not seen or had available); (F) Escape of radiation via Containment Emergency Sump Performance (e.g. radionuclides released to containment from excessive numbers of reactor trips at Harris induced by steam generator design defects, or other CP&L design and operating deficiencies as described above); (G) Station Blackout from wiring insulation degradation or other causes; (H) Failure to meet Shutdown Decay Heat-Removal Requirements due to loss of access to cooling towers, cooling tower failure due to earthquake (incl loss of access to same due to earthquake;

or sabotage or terrorism, which Harris' security plan fails to provide adequate detection of and defense against)(or sabotage or terrorism against the RHR or other heat removal systems of SHNPP, which also Applicants' security plan does not provide adequate detection of, or defense against); (I) Safety Implications of Control Systems (including failures due to the outdated design, cross-generational (of computer equipmt) interfaces, untested software, and vulnerable wiring of Harris' Integrated Control System and other controls; or failures in air lines due to, e.g. getting water in them during maintenance (CP&L's Brunswick maintenance is known to be sloppy) or tests, etc); (J) failure of hydrogen control measures, and effects of hydrogen burns on safety equipment (e.g. loss of power or control to Harris's only 2 hydrogen recombiners, failure of Harris's inadequate instrumentation to detect H_2 levels so the recombiners will be turned on before an explosion results, e.g. from operating motor sparking); and (K) Pressurized Thermal Shock (a serious problem at Robinson 2, see NRC documents thereon, nil-ductility temp already at 290 F after 11 years operating; applies to Harris due to outdated reactor pressure vessel, coolant pumps etc made to 1971 ASME-III codes) all of the above being as described by NRC, e.g. in NUREG-0606, Vol 4 No.1, Feb. 19, 1982 which document's descriptions of the above unresolved safety issues is incorporated herein by reference to show what the issues listed above are, through the "problem description" in NUREG-0606 for each issue listed above. (L) The concerns for interaction of such problems as expressed, e.g. by D.L.Basdekas of NRC (4-29-82 presentation to Commissioners and attachments thereto) also apply to Harris due to its old reactor vessel (ASME-1971 date) and control systems particular vulnerabilities. Interaction of such

weaknesses in the vessel, primary system (as described and refd above, including contentions 47-51 incorporated herein by reference) and in the control system as described above, can compound accidents and lead to much more serious consequences to the public health and safety in the form of radiation releases, i.e. a minor accident or incident like loss of feedwater can escalate through a reactor vessel fracture and further control system failures to a conmpletely uncontrolled release of radioactivity to the environment, e.g. by failure of containment isolation controls following vessel fracture or ATWS or any other incident (including ordinary reactor trips that lead to primary system relief valves releasing radioactivity inside containment in order to control primary system temperature and pressure). These matters include SYStems Interactions (Task A-17 of NUREG-0606, problem description incorporated by reference ~~xxxxxxxxxxxxxxxx~~ here for Task A-17.

#108 Applicants and their NSSS vendors, arthictect-engineer(s) and contractors and consultants have failed to take necessary steps (including research, measurement, and testing of comparable or SHNPP components) to provide full information necessary to evaluate the performance of reactor controls systems and instrumentation during normal transients and severe accidents (including Class IX), including dynamic characteristics of neutronic, thermal, hydraulic, hydrodynamic and hydrostructural systems of SHNPP and its primary system, damping ratios, frequency response characteristics, phase and gain margins, stability under transient and accident conditions, interaction (e.g, through impedance matching or mismatching, mechanical or electrical or thermal, including thermal and radiation effects on the

operating parameters and characteristics of power wiring and control equipment as described above, including all wiring and equipment necessary for Category I systems to operate effectively in a Class IX or less severe accident. This sort of performance needs to be verified on-site at Harris or a comparable operating nuclear plant (e.g. Virgil C. Summer, according to FSAR almost identical to Harris 1 and 2) by actual tests and measurements prior to Harris startup. The characteristics of Harris's defective steam generators (Westinghouse model D's) need to be similarly determined because leaks, sudden failures of multiple tubes (e.g. from vibration at power of 50% or above) can initiate shutdowns of the reactor and other transient conditions which can interact with the other equipment described above to cause more severe accidents, e.g. a steam generator tube leak followed by failure to SCRAM.

Moreover, a complete record of operational experiences of such systems (electrical and hydraulic and air-actuated control systems, hydrostructural systems (e.g. results of water hammers and steam hammers), thermal systems including ECCS and reactor coolant and feedwater pumps , and their controls, has not been compiled by Applicants or their above-described vendors to form a basis for appropriate design modifications to guard against control systems interactions that could (as described hereing and in contention 107(entire) above which is incorporated herein by reference) cause serious accidents, including Class IX ones, by means described under the definition of "accident" in this supplement, and in contentions 47 through 51,70,71,76,77,78,79,45,46,52 through 54 and92,93,96-97

and 102 which are incorporated here by reference with respect to the types of accidents and possible ways they can happen as described therein. Such a record is necessary to assure the health and safety of the public in the event of operation of SHNPP because the above-referenced and described accidents can severely harm the public and its genetic integrity.

#109 Applicants' FR and other existing reports available to me before 5.14.82 are inadequate in that they do not provide sufficient information (e.g. exact chemicals to be released into SHNPP lake or reservoir, identifying all chemical species therein or to be expected therein (in the releases); nature of the pollutants (organic and heavy metal and other) to be found in the Cape Fear River which may interact with Harris pollutants to form more toxic and hazardous and carcinogenic chemicals, temperature tolerence limits for all significant fish species in said lake ("important" species and other significant ones), actually measured background radiation levels and radionuclide concentrations around SHNPP on a statistically reliable basis for assuring the concentrations throughout the site and EPZ before Harris operates, data on the environmental impact of uranium mining including Th-230 and RN-222 releases and the long-term health effects thereof over 20 to 30 halflives of Th-230, erosion rates by wind of the overburden of buried or covered tailings from uranium mining, erosion rates from rainstorms (including gully formation) on said tailings overburden or cover), actually measured (by pressurized ionization equipment) radionuclide releases from operating

PWRs including VC Summer which is virtually identical in design to Harris) including nuclides, amount, release rates over time, etc. in a comprehensive form, data on actual deposition of radionuclide releases from operating nuclear plants (including rainout, fallout in snow, hail or sleet or freezing rain) including pattern of such deposition with adequate measurements to draw iso-nuclide -level lines on a map with statistical accuracy needed to predict food chain, direct human exposure and other radiological impacts of Normal SHNPP operation and postulated accidental releases in the Class IX category including those postulated per 10 CFR 100.11; and other information necessary to formulate and specify as may be required, environmental impact and safety/health impact contentions in this proceeding, including those to be based on new information under 10 CFR 2.714(b).

#110 Applicants' FSAR and the SER are deficient in that they fail to provide information necessary for the formulation or greater specification of contentions in this proceeding, including contentions to be based or modified or refined or revised on the basis of new information under 10 CFR 2.714(b). The above documents are incomplete, inadequate, inaccurate, do not yet contain responses to all NRC Staff questions of Applicants as part of NUREG-0800 and other NRC review of them, do not provide detailed, Harris-specific analysis, test data, test specifications, models and information to assure that Harris can be operated safely in spite of unresolved safety issues including those noted in contention 107 above and the latest edition of NUREG-0606,

fails to compute probabilities of accident sequences and interactions of equipment, controls, systems and plant inventories of radioactive material accurately (or at all in some cases, e.g. all of FSAR 15. as now written 5-14-82 (I checked the LPDR copy for any amendments last night in Raleigh, none found) (I also checked with librarian Hickman to see if any FSAR amendments had come in that were not in the reference copies. She says none have.), fails to adequately specify, list, test, and verify softward and hardware components of the integrated control system and other electrical controls of SHNPP, including information transfer lines, interfaces, buffers, memory, insulation, and other electrical components, circuits and information (including operator training, power supply characteristics, operating system, probability and testing of hardware failures in electronics and mechanical controls) necessary to safely carry out the functions of the ICS and other safety-related control systems or systems that control safety-related equipment (including ICS), fails to identify the model and adequately specify the characteristics of the steam generators as designed and as they may have been modified or will be modified, fails to provide proper analysis of the operation and failure modes of the steam generators and components, fails to provide "zero-defects" quality assurance standards for fabrication of components and equipment at Harris including the primary system, Category I equipment, other safety related equipment and all equipment listed or described above; fails to provide actual test data on Harris containment penetrations', wiring's, insulation's (including that on cables and wiring for controls, power and instrumentation inside containment or otherwise necessary

for the functioning of safety-related systems and equipment including the SCRAM, CRDM, ECCS, boron injection system and all others necessary to assure the health and safety of the public, fails to provide a Failure Modes and Effects Analysis (FMEA) for all safety-related components and systems and other components and systems listed or described above at Harris, fails to provide means to control hydrogen releases inside containment, fails to provide test data on radiation monitors under conditions comparable to a class IV accident, fails to provide adequate test data on the deterioration of insulation, containment penetrations, electrical connectors and ends, and other equipment as described above's all performance parameters including impedance and vibration, degradation, or failure rates and probabilities from tests of equipment at Harris or identical to it under conditions of heat, pressure, moisture, radiation and chemical components to be expect from, or possible in, nuclear accidents in the Harris containment; and fails to provide other necessary information for the formulation, refinement and revisions of contentions, under 10 CFR 2.714(b) and other NRC rules for refinement and revision of contentions (e.g. 10 CFR 2 Appendix A).

#110X The Environmental Statement (ES) for Harris is deficient in that it also fails to provide the information requested in contention #108 above (such information listing is incorporated herein by reference and other information necessary to fully evaluate the environmental impacts of SHNPP over the long-run (up to the end of its environmental impacts at least 11 million years from now) and short-run, including its risks and unintentional or undesirable effects, including those from nuclear accidents

and spent fuel transport accidents and sabotage and terrorism, sabotage and terrorism on the Harris site or against it, and sufficient information necessary to analyze the basis of such environmental impacts as to feasibility, probability of occurrence (s), technical accuracy of statements, models and calculations therein, author's or authors' judgments and their qualifications to make such judgments (including information on the accuracy of their past predictions and judgments comprehensively determined and evaluated for each such author) and other information as may be necessary to formulate, refine or revise contentions in this proceeding under 10 CFR 2.714(b) and other applicable rules of the NRC.

#111 Applicants, NRC and Westinghouse have not provided sufficient independence of safety and control functions in its design of the reactor and primary system of SHNPP and other parts of the Nuclear Steam Supply System and its controls; Dr. Stephen Hanauer of NRC believes "this is unsafe" and NRC has "no comprehensive and systematic demonstration that (failure of non-safety grade equipment or structures should not initiate or aggravate an accident)" (NUREG-0585. Absent a comprehensive Failure Modes and Effects Analysis of such interrelated systems in their "large number and types" (Hanauer), and appropriate redesign to avoid failures, initiation or aggravation of accidents as NRC requires, Harris cannot be operated safely. This is particularly applicable to Harris because of its outdated design and specification of a primary system components, e.g. reactor vessel, reactor coolant pumps, steam generators, etc. valves and controls therefore, CRDM, etc. which are more vulnerable to failure in that they do not reflect current knowledge or meet current safety requirements of codes or NRC, ASME, IEEE, ASTM

#112 Because of the design defects of Westinghouse model D steam generators as seen at Ringhals (Sweden) Almaraz (Spain), McGuire (NC, USA), V.C. Summer (SC, USA, almost identical to Harris), the use of model D steam generators at Harris coupled with corrosion problems of all Westinghouse S.G.'s is unsafe due to the excessive probability of sudden, multiple, or sudden multiple failures of steam generator tubes (e.g. one McGuire tube lost 20% of its wall thickness in 24 hours full power operation. Tests on such S.G.'s + plants remain inadequate to assess tube failure timing + probability) creating a LOCA or succession of LOCAs in operation, and thus releasing radiation to the environment, exposing workers to excessive radiation levels cleaning up after the LOCA or LOCAs, place stresses on safety related equipment, supports and components (esp after repeated LOCA) which those components were never designed to withstand repeatedly, and in these ways + otherwise not adequately protecting the public health and safety (e.g. another way is by producing large amounts of nuclear wastes from cleanup operations which then have to be safely stored and disposed of outside the normal radwaste control or spent fuel storage (as undamaged spent fuel) design, equipment and locations at the plant or elsewhere, posing the risk and possibility of additional escape of said nuclear wastes; another way is venting noble gases (Xe-, or KR-85 and Kr-87 and other radioactive noble gases) from containment or other location during or after an accident such as the LOCA described above or other such accident.)

The design of SHNPP should remove the model D steam generators and install better steam generators not subject to the above defects, risks and deterioration (including probability of multiple rapid steam-generator tube failures) before operation begins, in order to protect the public health and safety. Access to do this exists at Harris. contention #131 is incorporated by reference herein re corrosion.

#113 The materials of the Harris steam generators (Inconel 600 and others) are subject to corrosion which results in greater numbers of inspections and repairs, increased probability of steam generator tube failure (and resulting shutdowns, loss of power output, and potential accidents. Water chemistry changes intended to "cure" this problem have invariably resulted in other corrosion problems or worsened corrosion problems, in such steam generators as Westinghouse ones made with Inconel-600. The progress of corrosion makes steam generator replacement necessary before the design life of the steam generator or reactor is over, in many cases (e.g. Turkey Pt. 3,4; Surry 1,2) (Robinson 2, Prairie Island).

Such corrosion problems and the resulting need for more inspections, repairs, and eventually for replacement of steam generators result in larger radiation doses to repair personnel, increasing the population genetic damage from these personnel and their descdendants, and exposing the repair personnel to excess risk of cancers and other diseases induced by radiation exposure or ingestion of radioactive materials found in nuclear steam generators. The projected radiation doses from steam generators at Harris over the plant's projected operating life do not take account of the leaks, inspections, repairs and replacements that will be required, especially if the design defects specific to Model D steam generators (see contention 118 above for description of impact of such defect on McGuire nuclear plant) are not cured or the steam generators replaced with non-defective models before Harris operates. Such radiation doses to workers and contract employees will be excessive, will expose unknowing persons to radiation risk, (e.g. some of the personnel, all of their descendants (via genetic damage), and may expose under-age

persons to such radiation and risks as CP&L has done at H.B. Robinson #2. CP&L's weak record on radiation protection at Robinson, and weaknesses in its radiation protection program at Brunswick, both including placing priority on production of power, not on assuring safety of employees and contract workers (and the public), makes this problem particularly applicable to Harris. Repair and inspection account for the vase majority of worker radiation exposure. Use of the Harris steam generators in such circumstances (a) is not ALARA as required by NRC rules; (b) is not properly weighed yet in the environmental balance of Harris operation under NEPA; and (c) poses undue risk of accident from steam generator tube failure, and transport or storage of radioactive used Harris steam generators, to the health and safety of the public.

#114 The Virgil Summer plant will not be able to operate abovve 50% power output for "a long time" according to SCE&G(owner of that plant) officials. This is a consequence of design defects in Westinghouse model D steam generators such as Harris has, as also seen e.g. at McGuire 1 of Duke Power, Almaraz & Ringhals nuclear plants. Harris is virtually identical in design to VC Summer. Thus the power output loss, reliability loss and additional accident risks of Harris operation due to these steam generator defects need to be reconsidered in the ES and in striking the environmental balance under NEPA for the O.L. stage of Harris licensing. The above are new information since the CP stage under 10 CFR 51.21 in that this defect was not found until the above plants began startup, due to inadequate testing by Westinghouse of its steam generators. The long storage of Harris steam generators on-site compounds this problem by having inadequate QA/QC guarantees on them.

#115

Applicants and their NSSS supplier have not provided an available Failure Modes & Effects Analysis of Anticipated Transient Wihtout Scram (ATWS as used herein) including such effects as the pressure reaching levels (AEC/NRC says it can) in the vessel that the head is blown off and through containment (see American Physical Society report of 1975 on nuclear reactor safety, Review of Modern Physics 1975 Summer supplement p.S-1), failure of the boron injection system (its pump is not considered safety-related equipment At Harris and may fail) during ATWS, and other failure modes possible when a transient or event that should result in a SCRAM does not, e.g.,failure in the CRDM power supply, controls or logic from a short circuit or other cause), specific to Harris. The outdated reactor vessel, made to 1971 codes, is more vulnerable to overpressure, and to thermal shock when the ECCS tries to cope with ATWS or LOCAs resulting from the overpressure expected or possible in ATWS, CP&L's defective steam generators will also lead to more transients and reactor trips at Harris. increasing wear and tear on the SCRAM systems and increasing their likelihood of failure. Such an analysis (FMEA) of ATWS is necessary to assure that Harris can be operated without endangering the health and safety of the public, through accidents up to and including the extreme Class IX event (reactor vessel head through containment) described by APS, where it is shown that enough energy would be available to thrust said vessel head through containment, bringing fission products in the core into direct contact with, and out into, the environment abound Harris very rapidly.

#116 The fire protection and fire suppression systems at Harris are inadequate to protect the health and safety of the public and to ensure the safe operation of the plant. They also fail to comply with 10 CFR 50 Appendix A criterion 3, 10 CFR 50.48, and equivalence or better performance than required of plants previously licensed to operate, per 10 CFR 50 Appendix R. For example, the computer system is not adequately protected against fire, smoke, heat, cable fires, infrared radiation and against firefighting equipment and chemicals (including water) necessary to fight fires in and around the computer(s), I/O devices, wiring and cables to and from the computer (ICS system and other computer systems) including fires originating in these systems + places, to insure that the computerized ability to monitor the plant's status, offsite radiation exposures, onsite radiation levels, radiation (radioactive material) releases, and deliver such information to control room personnel and to emergency response personnel, and to shut the plant down in the event of unsafe conditions, is thus not assured. Adequate redundancy in computer and wiring systems in the plant, and adequate fire protection therefor to assure that the computerized ability to monitor and deliver information and to shut down the plant (all as described above) is continuously available, as is necessary to protect the health and safety of the public. The cooling, ventilation and power supply systems necessary for operation of the plant computer systems must be also adequately protected from fires originating in them and from fire damage or damage from fire-fighting that would or could prevent their operating within the proper parameters to permit continuous computer performance of the safety-required and emergency planning -required functions above.

#117 The emergency response plan does for Harris not make adequate provision for mobilizing wrecker trucks and other equipment necessary to keep evacuation routes clear in the event evacuation is necessary. Not only will accidents occur in any such massive movement of persons, but fear and panic will make them more likely. No matter how good the roads, cars or truck wrecks blocking the routes will render them useless or too little too late in evacuation. Such wreckers, fire protection equipment etc must be able to move to and to deal with accidents involving hazardous cargoes that happen to be on the road at the time of evacuation and are in or on routes being used or to be used for Harris EPMZ evacuation. Without evacuation, radiation exposures will be increased, especially for those caught on the road or in the open.

#118 the emergency response plan for Harris does not assure that hazardous materials and cargoes abandoned in the EPZ during an evacuation will be identified and secured and safeguarded during and after an evacuation as may prove necessary after an accidental release of radioactive material from the Harris plant.

#119 In striking the environmental balance for S.Harris nuclear plant operations under NEPA, the uncertainty in nuclear accident probabilities, and the best available information, as shown by NUREG CR-0400 and relevant operating experience, and by those events which, if they had occurred during accident sequences which have occurred, would escalate those actual sequences to CLass IX events or make them even more serious (for those actual events which are considered Class IX) and the probabilities of those events which would accomplish this escalation and more serious effects, based on the probabilities of those events as established by operating experience of nuclearpower plants, particularly ones similar in design to Harris.

#120 Harris plant design is inadequate to protect the public health + safety because it does not provide sufficient, and strong enough, energy-absorbing structures + devices including crush modules of honeycomb material, water bags, etc. to prevent damage to or severing of or fracture of wiring, insulation, cables + their jackets + insulation, pumps (e.g. ECCS, primary coolant) + control rod drives, + other safety-related equipment and the wiring, power supplies + other controls necessary to operate such safety-related equipment. Without assurance that shrapnel + missiles from failed pumps, bolts, pipes, wiring + cable whipping when torn or severed + shorting out, + other such flying objects inside containment (e.g. ejected control rod, broken pump shell or steam gen shell) serious class IX accidents can't be prevented.

#121 Radiological Emergency Response plans of the Applicant, the State of North Carolina, and the surrounding communities have been formulated without reference to the Draft Environmental Statement, Supplement (NUREG 0534, Supplement) and thus fail to address appropriate protective measures needed to provide radiological protection to all residents in the vicinity of the ~~HARRIS PLANT~~ who might be threatened with injury or death from an accident greater than a design basis accident.

#122 The Applicants lack~~s~~ the financial qualifications necessary to withstand the costs of various contingencies, including extended shutdowns of the reactor caused either by problems arising at the Harris plant (up to a maximum of a TMI-type accident) or by generic problems similar to those which have arisen at existing reactors and which have caused shutdowns at other reactors e.g. V.C. Summer potentially subject to those problems.

#123 The Applicants lack sufficient "hands on" experience among reactor operator staff assigned to SHNPP to safely run the Harris nuclear plant, both units, or Unit 1 , and no Operating License should be granted until adequate "hands on" experience is had by the Applicant's reactor operations staff.

#124 The Applicants and the surrounding counties do not possess the experience and technical ability adequately to plan for emergency preparedness, to prepare for a radiological emergency, or the capability for implementing protective measures based upon protective action guides and other criteria as required under NUREG 0654, Rev. 1, at II.J.9.

 Section 5 of Supplement (contentions) to Wells Eddleman Petition to Intervene (Sec. 5 begins this page)

#125 No reasonable assurance can be had that the facility can be operated without endangering the health and safety of the public through occurrence of a serious accident, beyond design basis. The Wash-1400 methods of probabalistic risk assessment claimed to serve as a basis and standard for finding a reasonable assurance of an acceptable risk to the public can not be carried out because human errors and common mode failures are not susceptible to that method of analysis and because the complexity and number of nuclear plant systems defies such analysis. Such serious issues have been raised and shown regarding the conceptual, methodological, statistical, and data underpinnings of the RSS that its use in licensing proceedings for decision-making is entirely inappropriate. NUREG CR 0400, the Lewis Report, Supra; Union of Concerned Scientists, "The Risks of Nuclear Power Reactors: A Review of the NRC Reactor Safety Study WASH 1400" (NUREG 75 014), pp. 113-130. Serious accidents with releases of radioactivity to the environment inimical to the health and safety of the public are now plainly credible after Three Mile Island.

Applicants have failed to demonstrate that during the time period following a postulated LOCA but prior to effective operation of the combustible gas control system, either (i) an uncontrollable hydrogen-oxygen recombination would not take place in the containment, or (ii) the plant could withstand the consequences of that hydrogen-oxygen recombination without loss of safety function.

Failures in Quality Assurance, the ASME Code date + the age of much Class I equipment, undermine confidence in the quality of construction of the containment and safety related systems so that no "built in" conservatisms beyond the design basis should be relied upon to provide a margin of safety.

Initiating events from outside the station in the form of loss of offsite power, or from within the station in such events as feedwater loss as at TMI-2, steam generator tube rupture as at Ginna or electrical insulation combustion as at Brown's Ferry. These accidents have taught us that sequential events contribute to the development of serious accidents such as sticking PORV's and disabled electrical systems. Subsequent events can lead to reactor pressure vessel breach, hydrogen release and containment breach.

Harris has been operating for 10-15 years. The nil ductility temperature of the reactor pressure vessel has increased to greater than 200 degrees F as commonly occurs with reactors of this age. Based on CP+L's Robinson 2, it might be over 300°F The turbine generator throws a blade, puncturing the turbine case and making the feed water system temporarily inoperative. The control system calls for reactor trip but the reactor does not SCRAM due to common mode failure of SCRAM systems leaving control rod solenoids activated. Pressure builds in the reactor coolant system due to decay heat, load loss and cessation of feedwater flow. The PORV opens, the pressure rises to the set points of relief valves which operate. The ECCS actuates. The accumulators and high pressure injection pumps perform according to design. Large quantities of cold water entering the reactor pressure vessel chill parts of it to below the high nil ductility temperature. Temperature differentials in the pressure vessel induce higher levels of stress, the effluent from the core is still at a high temperature. The combination of high internal pressure-high pressure injection pumps still operating, spring loaded relief valves now being closed, and the PORV partially closed - cause brittle failure of the junction of the reactor vessel and cold leg nozzle,

the weld having developed cracks. With the reactor breached ECCS flow no longer traverses the core. The core heats up, fuel rods fail + break open, and Cesium-134 and Cs-137 begin to vaporize + to react with remaining steam + water around the core. Due to an electrical failure in containment vent control wiring attacked by the CsOH + other corrosive, radioactive chemicals formed as the core proceeds toward melting, and reversion of epoxy resins in containment penetrations to their binary (liquid) formants (under the influence of heat, steam, radiation, high pressures in containment, + corrosive radioactive chemicals), the containment leaks. Or, if it holds closed, operators may be forced to vent it (containment) due to high pressure inside. Or the core may melt through the base mat or cause a steam explosion that bursts one or more containment penetrations, releasing in any of these events high levels of radioactivity to the atmosphere or to the auxiliary building where radwaste equipment is not designed to handle it in such quantities, + therefore it leaks out through the radwaste systems or through openings in the auxiliary building, into the outside environment, necessitating evacuation of the whole EPZ area if the core's 10^{11} Ci (10^{8} Ci long-lived) escapes in [redacted] amounts reasonably to be expected in such an events

#126 The economic costs of a severe accident with release of radiation to the environment (a so-called Class 9 accident) were not considered in the CP review for Harris. Such an accident could have enormous cost + socioeconomic consequences especially in the event of an atmospheric release with the winds blowing in the direction of the major population of Raleigh NC (our State capital + headquarters of most State government agencies + many business & professional associations as well as the home of 130,000 persons; or toward Durham (100,000 + 2 universities + Duke University Medical Center), Chapel Hill (Univ of NC, 10,000 students + 25000 in town) + NC Memorial Hospital). 45 FR 40101 established credibility of such accidents after the Harris CP stage. 10 CFR 51.21 requires that such new info as 45 FR 40101's determination that Class IX accidents are credible, and that the cost of such accidents must be weighed, be considered at the O.L. hearing under NEPA.

126X The Applicant's Environmental Report should provide a full description and detailed analysis of the environmental effects of the transportation of spent fuel shipments to the Harris [redacted] Plant from other CP+L [redacted] Company facilities and of the contribution of such effects to the environmental costs of licensing SHNPP [redacted], the values determined for such analysis for the environmental costs being figured into the NEPA cost-benefit balance for SHNPP

#127 operated without endangering the public health and safety because of CP&L's consistent failure to adhere to required Commission operating and administrative procedures provided for in Commission rules and regulations. "The Nuclear Regulatory Commission has the statutory responsibility for prescribing licensing standards to protect public health and safety and for inspecting the industry's activities against these standards. The Commission does not thereby certify to the industry that the industry's designs and procedures are adequate to protect its equipment or operations." Federal Tort Claim of General Public Utilities, Corp., et al, CLI-81-10, 13 NRC 773, 775-776 (1981). At both Robinson & Brunswick facilities of CP&L Company the Systematic Assessment of Licensee Performance Review Group found weaknessess in personnel adherance to operating and administrative procedures and "failure to follow procedures." NUREG 0834, Licensee Assessments, August 1981,

127X No reasonable assurance can be had that the facility can be operated without endangering the public health and safety because the Applicants' reactor operators and shift supervisors lack sufficient hands-on operating experience with large pressurized water reactors. The resumes of Catawba Plant Supervisors show that only a very few of these individuals who will have primary management responsibility for safe operation of the plant, FSAR, Table 1.9-1, p.2, have experience at large PWR's like Harris NUREG 0737, Clarification of TMI Action Plan Requirements, I.C.3. Resumes of Senior Reactor Operators and Reactor Operators when provided will similar lack of experience.

128 The license should not issue until and unless the hydrogen release consequences from that range and variety of LOCA's which the Applicant is required by the NRC to consider have been dealt with so as to make impossible damage to public health and safety. The igniter system cannot perform this function.

Stations main transformer burns out as it did recently at Duke's Marshall Steam Plant or the transmission line is brought down by a tornado or a heavy lightening strike in the switchyard disables the switch gear. Both reactors are operating at full power. Half of the diesel electric generating capacity fails to start. There is an insufficiency of on site power for safe shut down. Decay heat removal is inadequate due to inoperable feed water and reactor coolout pumps. This results in excessive reactor temperature and pressure. The reactor vents through the pressurizer spring loaded relief valves. The ECCS accumulator water is soon exhausted. The reactor coolout system continues to vent steam with the result of core exposure and subsequent melt down and core slump. There is massive hydrogen release, a metal-water reaction at least 80% complete. The air recirculation fan is inoperative. The Hydrogen monitors fail + igniters aren't turned ON. The igniters do not reach ignition temperature if turned on. Hydrogen accumulates in the containment. Diffusive mixing of hydrogen and containment air results in a combustible mixture. The temperature of the reactor surface is increased by the melted fuel to a temperature sufficient to cause ignition of the hydrogen-air mixture. Containment is breached, the estimated failure pressure of 67.5 psi being exceeded. The reactor vessel melts through and releases essentially the entire inventory of radioactive volatiles to the atmosphere as the containment penetrations fail. Species volatilizing at up to 3500°C (or more) are present in the atmospheric release. These precipitate near the site, making it too contaminated to use or enter. After 2 weeks, the spent fuel pool boils dry + its contents explode

by a steam pressure buildup or by reaction with the steam or liquid water present; the zircaloy cladding as it overheats, reacts with steam + water to form hydrogen. At some point a fragment of zirconium alloy or a hot glob of molten uranium (small enough to have pyrophoricity) ignites the hydrogen/oxygen mix inside the fuel building, blowing it apart + releasing almost all spent fuel fuel fuel isotopes to the air.

/i.e. SHNPP, >$3 million/long term job

129 Investment in capital intensive, rather than labor intensive, approaches to dealing with energy needs reduced monies available in the market to create jobs for residents of the Harris plant area.

The unavailability of these funds to create other jobs means that the socioeconomic impact of Harris is a net loss of jobs in the area + throughout CP&L's service area + those areas served by NCEMPA. More jobs in services, education, manufacturing (e.g. of more efficient equipment to use electricity) + other fields with the funds invested in SHNPP. The net losses of jobs associated w/ projects like SHNPP are established in a number of studies. Net job loss due to SHNPP is an impact of [redacted] Harris being completed (further investment in it means more net jobs are lost or will be lost) and must be considered under NEPA. This makes the NEPA balance turn even more against SHNPP + I request expedited hearing on this [illegible] as for #15.

III. FATIGUE FAILURE OF THE REACTOR PRESSURE VESSEL

#130 The steam generator tube problem encountered in Westinghouse's D Series Steam Generators is not satisfactorily fixed. The reactor requires shutdown and restart on a much greater rate than designed for - namely greater than a rate of 200 cycles in 30 years. The resultant fatigue carries an even more rapid increase in nil ductility temperature than encountered in normal operation. Cracks develop in the pressure vessel welds: a common occurrence as in Oconee 1. The many problems with the aging Oconee reactors and the steam generator problems at McGuire result in low nuclear plant capacity factors for the Duke system. To meet Winter peak Catawba is operated, although a shutdown to deal with nil ductility temperature well in excess of 200 degree F would be prudent. The turbine trip relieves an overload condition. The reactor SCRAMS and is directed toward a cold shutdown. After several hours the load problem is remedied. Parts of the reactor have fallen below the nil ductility temperature. Restart is too rapid in the effort to get the unit back on line. The excessively rapid pressure escalation and the excessive temperature gradients result in stresses in the vessel which are sufficiently large enough to cause a crack to propogate in brittle failure. Reactor is breached. From this point the scenario is similar to the ATWS scenario - resulting in a PWR-1 release. Applicants have Not proved that scenarios such as the above can reasonably be expected to Never occur at Harris [redacted]. Therefore the public health + safety is Not adequately protected + Harris should Not be licensed to operate.

#131 An AEC licensed plant experienced corrosion induced stud bolt failures, "An Investigation of the Failures of LACBWR Pressure Vessel Closure Studs," SWRI-2154-20, December 1971. The fix was a change in stud bolt alloy composition. Harris ASME-III, 1971 bolts are sensitive to corrosion by borated water. The FSAR requires bolts to be moved to a dry area during refueling and bolt holes in the pressure vessel flange to be used are defective. The presence of borate-water in the bolt holes is undetected. On resumed operation corrosion of the bolts takes place. The intrinsic strength of the bolting material vary appreciably. FSAR Table 5.3-12. About one year after refueling a turbine trip causes a pressure excursion in the reactor. The reactor SCRAMS. Although the PORV set point is not reached the increased load on bolts is sufficient to cause the weakest bolt to fail. Almost instantly the remainder of bolts fail due to load increase from decompression of the flange at a failed bolt and the initial load increase in the vicinal bolts. (the compression of the flange under normal loading is approximately 0.1 inches) As a result of the unzippering of the lid closure, the lid becomes a projectile, reaching a velocity of several hundred mph. As a result of steam thrust greater than one million pounds the lid is not deflected by the polar crane and strikes the containment dome, breaching it. The ECCS is defeated. Water pumped in to the reactor vessel flows out over the flange, kept from entering the core by steam blocking. The core melts discharging volitales and particulates to the atmosphere. The release qualifies as a PWR-1. Harris is vulnerable to the above accident, particularly due to its reactor vessel stud bolts' extra aging waiting for the plant to be built, the code to which they were made, + the likelihood of frequent repairs inside the reactor vessel + required backfits of new in-core instruments.

132 The Harris [redacted] control room fails to meet regulatory requirements in NUREG 0660, NUREG 0694, and NUREG 0737 in that the control room lacks sufficient instrumentation for detecting inadequate core cooling in case of abnormal events, Applicants have not demonstrated their ability to comply with current NRC requirements for overall control room design standards. The Harris control room design and instrumentation have not been subjected to a comparative evaluation of the interaction of human factors and efficiency of operation, and the FSAR fails to document how the plant can or will be modified to meet the new criteria imposed after TMI.

133 Harris [redacted] should not be licensed to operate until the Applicants have developed and demonstrated an adequate security plan which complies with 10 CFR 73.55. The FSAR does not give adequate evidence [redacted] that all regulatory requirements have been or will be met prior to operation. See FSAR, sec. 13[redacted], Regulatory Guide 1.17, Rev. 1.

134 The Applicants have failed to demonstrate that the diesel generators which are critical to the safe shutdown and control of the reactor in the event of loss of off-site power are designed, constructed and operated at standards sufficiently high that they may be relied upon to reasonably assure that the health and safety of the public will not be endangered.

135 Applicants have made no plans for ensuring that funds will be available to safely decommission Harris [redacted] in conformance with NRC rules and regulations.

ADDENDA To contentions (incorporated by reference into the contentions listed or wherever the listed terms occur herein) by Wells Eddleman, 5/14/82

Wherever Class IX accidents are mentioned, a reference to 45 FR 40101 (June 9, 1980) requiring that Class IX accidents be considered in striking the environmental balance under NEPA, which requirement is a changed circumstance under 10 CFR 51.21 since the CP stage of this proceeding, is implicit as if fully set out therein (incorporation by reference, as a definition of "Class IX").

Wherever ATWS or the American Physical Society report on reactor safety, (1975, Supplement, beginning p.S1) including the accident where the reactor vessel head blows off and breaches containment, or the preceding accident not referenced to APS is mentioned herein, contention #77, giving 2 ways both events might happen, is incorporated by reference as an example of how such events could happen.

Contentions #15, 33 and _____ (item on p. 24 as indicated) are incorporated by reference into #3 as further instances of CP&L's lack of safe management capability.

Concerning contention #11, SHNPP resident inspector George Maxwell has told me (5.12.82 by phone) that some cable and wiring is stored onsite at SHNPP now, made to IEEE-323-1974 standards.

In each of Contentions 47 through 51, the following statement is incorporated by reference as if fully set out in each contention: "Applicants have not shown proof they are in full compliance with 10 CFR 50 Appendix A criteria 14, 31, 32 and 51 with respect to the matters herein at SHNPP"

The definition of "accident", "nuclear accident" or "release (ing) radioactive material" on page 22 includes also: "by passing or failure of liquid radwaste or solid radwaste treatment systems; or another sequence of events including any of the above means to release radioactive material" and the meaning re spent fuel includes "or breach of the casks or loss of coolant therefor from any of the above causes."

ADDENDA to contentions + definitions
continued

The preceding "accident," "Nuclear accident" + "release (ing) radioactive material" definition also includes "release or escape of radionuclides, as above or through a hole or crack or gap in the building, cask, vessel, fuel rod, fuel tube, fuel pellet, pipes, welds, seals, containment penetrations or other means which might prevent such release or escape of radionuclides into the environment, said hole or crack or gap being caused by any of the means or events herein including improper construction, errors in operation, thermal stress, or stresses and chemical effects of a combination of heat, pressure, radiation, moisture, corrosion, + oxidation — including any of those 1 or 6 things by itself."

Add to contention #3: CP&L's management competence for nuclear plants is also in doubt due to their record of weak health physics and radiation protection programs (a continuing problem at Robinson 2 for many years, and a problem at Brunswick also, see Jacobstein, Investigation, supra) and because CP&L has been fined at least 6 times in amounts equaling or in excess of $40,000 by NRC for a number of violations, this being an unusually large number of such large fines to a utility, particularly when compared to the number of nuclear plants CP&L operates vis-awvis utilities such as Duke Power, VEPCO, Commonwealth Edison and others and the fines those companies have been given by NRC.

ADDENDA to contentions and definitions, 3d page

Definition as used herein: a reference to "probability" of events & accidents not being determined by Applicants, includes the fact that without such probabilities, the requirements of 10 CFR 50.59(a)(2)(i) cannot be satisfied

"deficiency" includes within its meaning "not in compliance with the applicable part(s) of 10CFR 55a", as do "insufficient(ly)" "inadequate(ly)" and "deficient" and where "XXX(ly)" means "YYX" and "XXXly"

"Take or pay" contracts are further defined as "such as referred to at page 8 of the Application in this case.", wherever the phrase "take or pay contracts", "take or pay" or reference to such a contract appears herein.

Any reference to spent fuel transportation includes by definition as used in this supplement: "as requested in pp 6-7 of the Application in this proceeding for such additional licenses as may be necessary or appropriate and authorization to store source, special nuclear and byproduct material irradiated in the nuclear reactors licensed under DPR-23, DPR-62 and DPR-71 and subsequently transported to the SHNPP site" (DPR-23 is H.B.Robinson 2 of CP&L; DPR-62 &71 are the Brunswick reactors jointly owned now by CP&L and NCEMPA)

Any reference to "fast fracture" or "thermal shock" herein includes by definition herein a reference to the Application, Appendix B, pp14-15.

Any reference to "emergency plans" or "emergency response plans" includes by definition herein "under 10 CFR 50.47; 50 App E; 50.54(s),(t),(u)

ADDENDA + definitions p. 4

By definition herein:
Any reference to "security plans" includes 10 CFR 73, eg 73.55

any reference to "criticality" includes 10 CFR 50 App A Criterion 62

any reference to "heat sink includes Criterion 44 of 10 CFR 50 App A (also 45 + 46 criteria thereof if applicable)

any reference to "spent fuel building" or "radwaste systems" includes criterion 61 of 10 CFR 50 App. A

any reference to "Quality Assurance" or "QA/QC" includes 10 CFR 50 App. B

Further definitions + matters applicable throughout this supplement to petition to intervene:

(1) Wherever any deficiency, error, or failure to take into account matters under NEPA is alleged with respect to the ER or the ES, the ~~xxxx~~ "ER" means "ER and/or ES" and "ES" means "FS and or ER" and either "FS" or "ER" or both includes "and new information under 10 CFR 51.21 and 10 CFR 2 Appendix A VIII and Calvert Cliffs (Calvert Cliffs Coordinating Committee v. AEC, 449 F2d 1109, which reads at 1128, "NEPA requires that an agency must - to the fullest extent possible under its other statutory obligations - consider alternatives to its actions which would reduce environmental damage ... Clearly, it is pointless to "consider" environmental costs without also considering action to avoid them." There is no statute barring consideration of these matters at the O.L. stage, nor one that obligates NRC or this Board to avoid consideration of costs and benefits in the light of new information now available. CALVERT CLIFFS requires that such ~~xxxx~~ issues receive the fullest consideration possible throughout the agency review process, which obviously includes this O.L. proceeding which is part of NRC's review process. And that such consideration be "full + fair" ibid.) and Seabrook ~~%~~(5 NRC 503 (1977) which states at 533 "Indeed, our conclusion substantially depends on the integrity of the NEPA process which leads up to the point of hearing. Where that integrity is absent - where time and money have been misspent - it may be proper to restrike a NEPA analysis on the basis of a set of facts no longer existing, i.e. as though those expenditures had not been made." In the light of CP&L Chairman Sherwood Smith's recent statements (reported 5.9.82)

that "if we were going to start the Harris project again ... it would not be nuclear" and that "coal plants cost about one third of what nuclear plants cost to build" --I believe he's comparing Mayo 1 and Harris 1 -- the above is clearly applicable to this case: time and money misspent requires a restriking of the NEPA balance as if the money sunk into Harris had never been spent, and in light of currently (1982) available information about power needs in the future on the CP&L and VACAR power grids, and all other costs + benefits of SHNPP.

But the stronger assumption of Seabrook, supra, that the NEPA balance can be restruck excluding sunk costs, obviously includes the alternative of restriking the NEPA balance including those sunk costs or part of them, where the NEPA process which leads up to the point of hearing (e.g. this O.L. hearing) lacks integrity, as shown by the numerous new facts and estimates which have come to light since the C.P. hearing in 1977, and which the former Board in this case (and NRC) have so far refused to hear, e.g. CP&L's own new and most current load forecasts made from October 1977 onwards, new cost estimates of the Harris plants, the operating performance of other nuclear reactors of similar manufacture and design and size, the emergence of problems, such as steam generators wearing out at Robinson 2, Turkey Point 3 & 4, Surry 1 and 2, etc. which have high repair costs and adversely affect power production and have considerable radiological effects on repair workers and thru nuclear waste disposal of the old steam generators, the trend of nuclear construction costs to ever further increase, repeal of the NC CWIP statute, and other new information under 10 CFR 51.21)

The above statement and definition is incorporated by reference wherever and whenever the ER, NEPA, or the ES is referred to in contentions herein.

The statement below is also incorporated into each contention IN this supplement herein as if fully stated therein. every reference to unavailability or ~~availability~~ With respect to availability of documents, not being actually available by (or "on or before") May 14, 1982 includes the following: Not being on an accession list actually in the LPDR on or before February 26, 1982; not being on an accession list there on or before March ~~22~~ 31, 1982; not being on an accession list publicly available there on or before May 9, 1982 (end of closing to public of Wake LPDR May 3-9; reopened May 10); or not being on an accession list publicly available there by May 14, 1982 and in consequence of any of the above (or all of them), not being known to petitioner, who can see what documents are present and which ones on available accession lists are missing, but cannot reasonably be expected to see which documents are not there, particularly when no listing indicating such document(s) should be there are not actually available to petitioner at the LPDR; and also including such documents identified generally (e.g. identification as "all reports over 10 pages after 1/1/80 in the accession list delivered & available to me first on May 10, 1982" as stated to PDR, NRC, 5-11-82 by phone) (that being based on search of LPDR files 5-10-82 using said list) or more specifically as by title, date, nature of document, accession number, author(s), etc or any of these, to LPDR Branch or NRC prior to 14 May 1982 which were not actually delivered to the LPDR and thus actually available to petitioner on or before 14 May, 1982. It is clearly impossible to frame contentions or specify them in more detail based on unavailable information such as the above-described items and types of items. I have requested extensions of time from the Board to file based on such documents, and renew that request here-45 days after receipt of any such document(s) due to large volume of documents missing to review

The typing and typographical errors herein are virtually all my own (except for some material reproduced herein) and I apologize for same, the condition of my typewriter, and the numerous insertions and additions herein which there was not time to retype in this long xxx supplement before the 14 May 1982 deadline since I'm doing all the typing myself and producing the original copy that way (xx i.e. having someone else help type would result in slower production of this document, not faster), but which it was necessary to add for completeness, clarification, specificity, reference to matters known to me, and other good causes. I ask the Board to consider this document properly filed for the above reasons and to afford me the opportunity to explain, correct, retype or have retyped, clarify or xxxx otherwise fix any part of this document or all of it which for any reason is not clear, readable, or otherwise usable in this proceeding, since I could not reasonably have produced and filed it by 14 May 1982 other than in the form it is in and have included the contentions and information herein which I believe is necessary to protect my interests in the SHNPP O.L. x proceeding.

Definition in this supplement:
"The legal case NRDC v. NRC, Civil Action # 74-1586 DC CIRCUIT COURT OF APPEALS (Slip opinion) decided 4/27/1982 shows that Table S-3 is not valid. Ergo, the argument that SHNPP licensing is barred by the above case is included by reference herein" is the additional meaning of "Table S-3" or "uranium fuel cycle" or "Nuclear fuel cycle" as used in this supplement.

Conclusion pleading on contentions

With respect to the contents of this supplement including all the contentions and references herein, I respectfully ask the Board to take note of the following:

(A) This entire supplement was drafted by me while I was (and still am) going through a learning process about NRC's rules, information, applicable case law, the SHNPP and other relevant matters. Therefore, it was necessary to make changes and additions, in many cases rapidly, to meet the filing deadline for this supplement per the Board's 4/2/82 Order. I do not have typing assistance and in some instances did not have the use of a typewriter when these changes and additions needed to be made to get this filing duplicated and served per said Order. Thus I had to use handwritten inclusions herein. All such form an integral part of this supplement as served, and are necessary to protect my interests in this proceeding.

(B) it is common in legal documents including filings in this case and NRC rules to: (i) make definitions (e.g. 10 CFR 40.4, 55.4 + FSAR 7.1.0 etc) and modify those definitions (e.g. 47 FR 13753 modifying 10 CFR 2.4, 3/31/82); (ii) use incorporation by reference and cross-reference (see e.g. FSAR sec 1.6, or 10 CFR 50.47 and 10 CFR 50 Appendix E which reference each other; 10 CFR 50APP G which references ASME & other codes); (iii) amend or change an earlier-written document in the light of new information or for other reasons, e.g. Amendments 1 and 2 filed under oath by CP&L to FSAR (and Amdts 1and 2 filed similarly to ER) and, e.g., 10 CFR 50.2, 50.33, 50.40 and 50.55 per 47 FR 13254; and that 10 CFR 27.14(b) does not exclude or prevent any of the above acts in filing this supplement per the Board's 4/2/82 Order.

Conclusion pleading on contentions continued

I respectfully request opportunity to show, by a hearing on the contentions listed hereinabove, and others to be filed later based on new information under 10 CFR 2.714(b), that Applicants fail to carry their burden of proof under 10 CFR 2 Appendix A VIII (entirely) and VI (as applicable except where the context requires otherwise), and therefore licenses to own, operate, or use the Shearon Harris Nuclear Power Plant Units 1 and 2, or to store, possess and use spent fuel or other source material as requested in their Application in this case, should be denied because the grant of any such licenses would contravene the National Environmental Policy Act (42 USCA Sec. 4332) since the economic, environmental and other costs, including also accident risks and long-term effects of radiological releases and effluents from the nuclear fuel cycle and nuclear wastes and spent fuel, including costs of deaths, illness, caring for victims of genetic defects, and other ill effects including property damage which result from the operation of Harris outweigh the economic, technical and other benefits of the project, new and additional information now being available which clearly alters the considerations made at the Construction Permit stage for this facility and shows that the benefit-cost ratio of the project is below 1 (costs exceed benefits), and said licenses should also be denied because Applicants have not demonstrated that the construction of the facility can be completed on a timely basis (especially units 3 and 4) and in conformity with the construction permit and the application as amended, the provi-

sions of the Atomic Energy Act, and the rules of the Nuclear Regulatory Commission, and that the facility will operate in conformity with the preceding (except the C.P.) and that the activities authorized by any such licenses can be conducted without endangering or harming the health and safety of the public or any members thereof; and that all such activities will be conducted in conformance with NRC's rules; and that Applicants have the necessary managerial and technical and financial qualifications and competence to do all of the above; and that the nuclear insurance provisions of 10 CFR 140 will be met throughout the term of any and all said licenses; and that the license issuance is not inimical to the common defense and security (e.g. by providing a target for terrorists and conventional bombs and missiles or for nuclear ones as contended above) or to the health and safety of the public (e.g. through short- and long-term health damage effects and genetic damage effects of radioactivity released to the environment in connection with nuclear fuel mining, fabrication, and use, or from nuclear wastes or spent fuel, over at least 20 half-lives of each radionuclide involved (time to decay to 10^{-6} of initial amount; 30 half-lives is more appropriate to nuclides of high radiotoxicity like Pu-239 or those produced in large quantities or released in large quantities); and that issuing any such licenses is in accordance with NEPA Section 102(A) (C) and (E) <u>and</u> 10 CFR Part 51, the "and"s above being justified since I am contesting under each such item's purview in 10 CFR 2 Appendix A VIII(b) seeking denial under part (c) thereof. If any license is issued, it must be conditioned per these contentions to protect the health & safety of the public, & ensure compliance w/ NEPA.

Wells Eddleman

Wells Eddleman
14 May 1982

WE

CERTIFICATE OF SERVICE

I hereby certify that under the Board's Order of April 1982 I have served, by mailing ~~amcoes~~ to each, first-class postage pre ~~mx~~paid and deposited in a depository under the exclusive care and custody of the US Postal Service, a copy of the above Supplement to Petition to Intervene by Wells Eddleman (including all its parts), this 14th day of May, 1982, addressed to those listed below.

Wells Eddleman
Wells Eddleman

Secretary of the Commission
Attention Docketing and Service,
50-400/401 O.L.
USNRC
Washington, DC 20555

Atomic Safety and Licensing Board
Dockets 50-400/401 O?L?
USNRC
Washington DC 20555

* George Fox Trowbridge
Shaw, Pittman, Potts and Trowbridge
1800 M Street NW
Washington DC 20036

*Samantha Flynn of CP&L has verbally requested hand-delivery of Trowbridge's copy from me at Durham - when I evaluate her written request I'll either do that or serve Trowbridge & loan her a copy. W.E.

She has agreed to supply a statement accepting hand delivery for Applicants. It will be appended hereto. W.E.

5/14/82 Dockets 50-400/401 O?L?

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supplement to petition to intervene,
by Wells Eddleman

end section

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I hereby certify that Steven Callis is authorized to accept, on behalf of Carolina Power & Light Company, personal service of the Supplement to Petition to Intervene of Wells Eddleman in Docket Nos. 50-400 and 50-401 at the Offices of Universal Printing Company in Durham, North Carolina on May 14, 1982 in lieu of service by mail addressed to George Trowbridge, Washington, D.C. and that such service satisfies the requirements for service set forth in the Order of the Atomic Safety and Licensing Board dated April 2, 1982.

Samantha Francis Flynn

Samantha Francis Flynn
Associate General Counsel
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602
Telephone: (919) 836-7707

Dated: May 14, 1982

I hereby certify that I have this day personally received a copy of the Supplement to Petition to Intervene of Wells Eddleman in Docket Nos. 50-400 and 50-401.

Stephen H. Callis, Jr.

Steven Callis
May 14, 1982

(including expanding [illegible]

Index, attached to this and at end of supplement

Statement of S. Flynn of CP&L re acdenting service by hand and refusing service to G.F. Trowbridge on behalf of Applicant and NCEMPA and that she is authorized to do so, will be attached if delivered to me timely for hand service; else I'll lend her a copy for 1 week to use and mail the copy to Trowbridge, as she & I discussed by telephone, for service, & mail to R.E. Jones. Legal Dept, Carolina Power + Light Co., Box 1551 Raleigh NC 27602, as She + I discussed 5/14/82 by phone

5/14/82 Dockets 50-400/401 O?L?

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'82 MAY 17 P2:14

Copy Made on USPS
Durham Main P.O. copier.
This copy mailed to NRC
Docketing + Service 11:55 pm 5-14-82
Wells
Eddleman

11:33 pm 5-14-82

Dear Richard Jones
& Samantha Flynn

There is an omission (inadvertent) from the copy of my supplement to petition to intervene in NRC Dockets 50-400/401 O.L. which your agent accepted service of. At p. 15, contention #129 is included in those on which expedited hearing is sought. I will mail this direction from Durham Main PO for fast delivery. Wells Eddleman

Eddleman
718-A Iredell
Durham NC 27705
Mailed 11:44pm 5-14-82

Richard E Jones
Samantha Flynn
Legal Dept
Carolina Power & Light
Box 1551
Raleigh
NC 27602