UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' ANSWER TO WELLS EDDLEMAN'S MOTION FOR FURTHER DEFERRAL OF PARTS OF CONTENTION 107 AND TO WELLS EDDLEMAN'S NEW CONTENTIONS AND AMENDED DEFERRED CONTENTIONS IN RESPONSE TO STAFF SER

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Dated: February 6, 1984

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Introduction

On January 17, 1984, intervenor Wells Eddleman filed two pleadings entitled "Wells Eddleman's New Contentions and Amended Deferred Contentions in Response to Staff SER" (SER Contentions) and "Motion for Further Deferral of Parts of Contention 107" (Eddleman Motion). In this Answer, Applicants respond to both of these pleadings. As discussed in detail below, Applicants believe that the Board should not defer ruling on the admissibility of Contention 107 but rather, should reject it. Applicants also oppose the admission of Contentions 107-X, Y and Z, and 173 through 181.

The Eddleman Motion

The Eddleman Motion seeks to continue the deferral of Eddleman Contention 107-A through 107-L, deferred by the Board in its Memorandum and Order of September 22, 1982 pending issuance of the Shearon Harris Safety Evaluation Report (SER). Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference), LBP-82-119A, 16 N.R.C. 2069, 2106 (1982). Contention 107 is no more than a listing of unresolved safety questions allegedly applicable to the Shearon Harris facility. See Eddleman Supplement to Petition to Intervene, May 14, 1982, at 213-15. The contention was proposed prior to issuance of the SER. It contains no explanation of why the Staff's treatment of these issues in the SER is inadequate. The rationale proferred by Mr. Eddleman for continuing to defer a Board ruling on the admissibility of proposed Contention 107 as originally drafted is Mr. Eddleman's opinion that the SER fails to address generic unresolved safety issues in a manner that enables him to refine Contention 107. (Notwithstanding this claim, Mr. Eddleman also has formulated three contentions, 107-X, Y and Z, which challenge the adequacy of the SER's discussion of generic unresolved safety questions. Contentions 107-X, Y and Z are discussed below.)

The Eddleman Motion is based on Mr. Eddleman's misunderstanding of the obligation of the NRC Staff to address in a

facility's SER unresolved generic safety issues applicable to the particular plant. Undoubtedly, in the SER the Staff must provide an explanation of why operation of a particular facility can proceed even though an overall solution to an applicable generic problem has not been found. Virginia Electric and Power Company (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 N.R.C. 245, 248 (1978); Gulf States Utilities Company (River Bend, Units 1 and 2), ALAB-444, 6 N.R.C. 760 (1977). The most common justifications for permitting the plant to operate, notwithstanding the existence of significant applicable generic safety questions, are that a solution satisfactory for the particular facility has been implemented; a restriction on the level or nature of operation adequate to eliminate the problem has been imposed; or the safety issue does not arise until the later years of plant operation. North Anna, supra, 8 N.R.C. at 248.

The SER must explain the Staff's position on significant generic safety questions applicable to the Shearon Harris facility; the Staff cannot ignore these issues or state only that a search for a generic solution is underway. North Anna, supra, 8 N.R.C. at 249. "The Board should ... be able to look to [the SER] to ascertain the extent to which generic unresolved safety problems which have been previously identified in [an NRC technical document] have been factored into the staff's analysis for the particular reactor -- and with what

result." River Bend, supra, 6 N.R.C. at 775. However, in stating its reasons for allowing operation to go forward, the Staff certainly can rely on and refer to documents which provide a much greater substantive discussion of the generic safety issue. North Anna, supra, 8 N.R.C. at 248 n. 7. If it were not permitted to do so, the SER would be an extraordinarily voluminous recounting of complex technical issues already articulated in detail in other NRC technical documents.

Appendix C to the Shearon Harris SER is specifically included in the SER to respond to the Appeal Board's 1977 River Bend decision, ALAB-444, and the Appeal Board's 1978 North Anna decision, ALAB-491, on the SER treatment of unresolved safety questions. See SER, Appendix C at C-2. In Appendix C, the Staff generally explains its policy on and treatment of unresolved safety issues, and specifically addresses the 16 generic safety tasks applicable to the Shearon Harris facility. NUREG reports containing proposed Staff resolutions of generic safety issues have been published on 7 of these 16 tasks and are appropriately referenced by the Staff in Appendix C at C-5. In addition, applicable portions of the SER that address these 7 issues are referenced in Appendix C. See Appendix C at C-5 (Table C.2). With respect to the 9 remaining safety issues, Appendix C contains a detailed discussion of these tasks. This discussion appropriately includes references to related discussions in the SER, and to other relevant technical documents.

See Appendix C, Section C.4 (pp. C-9 through C-21). Compare Louisiana Power and Light Company (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 N.R.C. 1076, 1112 (1983) (reference to insufficient one page boilerplate discussion of unresolved safety issues in SER).

At the same time that the Staff is obligated to identify in the SER unresolved safety questions applicable to the Shearon Harris plant, and to discuss the Staff's basis for permitting the plant to operate notwithstanding these outstanding issues, Mr. Eddleman also has certain obligations as an intervenor. Duke Power Company (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 N.R.C. 1041, 1048 (1983). "Parties interested in litigating unresolved safety issues must do something more than simply offer a check list of unresolved issues; they must show that the issues have some specific safety significance for the reactor in question and that the application fails to resolve the matters satisfactorily." Metropolitan Edison Co. et al. (Three Mile Island Nuclear Station, Unit No. 1), ALAB-729, 17 N.R.C. 814, 889 (1983), citing River Bend, supra, 6 N.R.C. at 772-73. Contention 107 as originally drafted utterly fails to satisfy this standard. It contains no discussion whatsoever of the Staff's proposed treatment of generic unresolved safety issues as they relate to operation of the Shearon Harris facility.

In conclusion, there is no basis for continuing to defer proposed Contention 107. The issues identified by Mr. Eddleman in Contention 107 now have been addressed extensively by the Staff in Appendix C as well as in other sections of the Shearon Harris SER. Contention 107 as originally proferred contains no supporting statement of basis for Mr. Eddleman's sweeping assertion that the Staff has inadequately addressed unresolved safety issues. Mr. Eddleman's failure to amend the original Contention 107 to address specifics of the Staff's treatment of the unresolved generic safety questions applicable to the Shearon Harris facility constitutes a default on these issues. See Three Mile Island, supra; see also 10 C.F.R. § 2.714(b) (contentions must state a basis with reasonable specificity). Accordingly, the Eddleman Motion should be denied, and Contention 107-A through 107-L should be rejected.

The SER Contentions

The established standard for admitting new late-filed contentions in an operating license proceeding that are based on previously unavailable licensing-related documents is set forth in 10 C.F.R. § 2.714(a)(1). See Duke Power Company, et al. (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 N.R.C. 1041 (1983). Not only must a petitioner proposing a late-filed contention satisfy the "bases . . . with reasonable specificity" requirement of 10 C.F.R. § 2.714(b), but he also must

establish that a balancing of the following five considerations favors admission of the late-filed contention: (i) good cause, if any, for failure to file on time; (ii) the unavailability of other means whereby the petitioner's interest will be protected; (iii) the extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record; (iv) the extent to which the petitioner's interest will be represented by existing parties; and (v) the extent to which the petitioner's participation will broaden the issues or delay the proceeding. 10 C.F.R. § 2.714(a)(1).

The first factor in Section 2.714(a)(1), the so-called "good cause" factor, is satisfied if an intervenor can establish that the specific late-filed contention (i) is wholly dependent upon the content of a particular document; (ii) could not therefore be advanced with any degree of specificity (if at all) in advance of the public availability of that document; and (iii) is tendered with the requisite degree of promptness once the document comes into existence and is accessible for public examination. Catawba, supra, 17 N.R.C. at 1043-44. An intervenor is considered by the Commission to have accepted the obligation of uncovering publicly available information, notwithstanding its voluminous, abstruse or technical nature. Id. at 1048. Thus, "the institutional unavailability of a licensing-related document," such as the Safety Evaluation Report, "does not establish good cause for filing a contention

late if information was available early enough to provide the basis for the timely filing of that contention." Id.

Contentions 107-X, Y and Z. Contentions 107-X, Y and Z are premised on Mr. Eddleman's view that the SER's discussion of unreviewed safety issues (USIs) cannot rely at all on references to extrinsic technical documents. For example, in Contention 107-X, Mr. Eddleman criticizes the SER treatment of USI A-40, Seismic Design Criteria -- Short-Term Program, because it references the Shearon Harris FSAR. SER Contentions at 2. This absurd allegation of course is the basis for the Eddleman Motion seeking to defer a Board ruling on Contention 107-A through 107-L. Contentions 107-X, Y and Z for the most part are no more than a check list of unresolved safety issues. (Only three of the issues raised in the earlier proposed Contention 107(A) through (L) are excluded from the 107(X), (Y) and (Z) check list.) For the reasons stated above in response to the Eddleman Motion, the Staff SER satisfactorily states the position of the Staff on unresolved safety issues applicable to the Shearon Harris Facility. Accordingly, Contentions 107-X, Y and Z should be rejected.

There are, however, several more specific statements in Contentions 107-X and Y that merit an additional response. Mr. Eddleman complains in Contention 107-X that in its discussion of USI A-17, Systems Interaction in Nuclear Power Plants, the SER fails to relate a referenced Sandia study to the Harris

plant. As explained in the SER, the Sandia study is the generic NRC Staff effort, currently in progress, directed at identifying potential adverse systems interactions that may not have been considered by current review procedures. SER Appendix C at C-10. The Harris plant is one facility that potentially could be affected by the outcome of this study, which is why USI A-17 and a discussion of the Sandia effort is included in the Shearon Harris SER. With respect to the one potential adverse interaction identified to date from the Sandia study, corrective measures have been implemented at Shearon Harris. Id. at C-10 and C-11.

In Contention 107-Y, Mr. Eddleman has misconstrued the Staff's position regarding USI A-44, Station Blackout, in stating, "staff review not to be complete until some time before fuel load." SER Contentions at 3. While it is true that the Staff will perform a review of emergency procedures and training programs for station blackout events prior to fuel loading for conformance to Generic Letter 81-04, the SER makes clear that completion of this review is not necessary in order for the Staff to provide sufficient justification for operation pending resolution of this issue. As the Staff notes, there is reasonable assurance that a total loss of all AC power will not prohibit adequate core cooling because of, e.g., the ability of the emergency feedwater system to function without AC power, and the programs undertaken to improve the reliability of the

diesel generators. SER at C-13. Mr. Eddleman takes issue with neither of these substantive findings, which form the basis for the Staff's conclusion that Shearon Harris can be operated before the ultimate resolution of USI A-44. He therefore has failed to set forth a reasonably specific basis upon which to challenge the Staff's resolution of this issue.

In Contention 107-Y, Mr. Eddleman also focuses on the interim status of resolution of USI A-47, Safety Implications of Control Systems, apparently inferring that there is no basis for allowing operation prior to the final resolution of this issue. Again, however, Mr. Eddleman fails to address the technical basis for the Staff's conclusion that, subject to the receipt of appropriate information from Applicants on equipment qualification (see SER § 3.11), and the completion of instrumentation modifications committed to by Applicants (see SER § 7.7.2.2), there is reasonable assurance that the Harris Plant can be safely operated before the ultimate resolution of this generic issue. SER at C-18 and C-19. Mr. Eddleman has not specified any basis for challenging this Staff finding.

Applicants also oppose the admission of two of the safety issues which Mr. Eddleman seeks to raise under the aegis of Contentions 107-X and Z because they are the subject of two previously admitted contentions. USI A-1, "Waterhammer," referenced in Contentions 107-X and discussed in Contention 107-Z, is encompassed by Eddleman Contention 45 dealing with the same

subject. Both contentions concern the adequacy of the design of the main steam and feedwater systems to withstand water hammer events. Furthermore, the Maine Yankee water hammer event referred to in Contention 107-Z was caused by the top feed ring design of the Maine Yankee steam generator, which the Harris generator does not use. See SER, App. C at C-7 (reference to Harris steam generator "bottom-feed, preheat design"). Similarly, the concerns associated with USI A-3, "Steam Generator Tube Integrity," reference by Mr. Eddleman in Contention 107-X, already have been raised in Joint Contention VII, co-sponsored by Mr. Eddleman. Because these two issues are clearly redundant, they should not be considered within the scope of proposed Contention 107. See Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference), LBP-82-119A, 16 N.R.C. 2069, at 2090, 2095 (1982).

In summary, Applicants oppose the admission of proposed Contentions 107-X, Y and Z. These contentions are no more than unsupported "check list" allegations that fail to meet both the general pleading requirements of 10 C.F.R. § 2.714(b), and the specific pleading requirements for unresolved safety issue contentions articulated by the Appeal Board in ALAB-444 (River Bend) and ALAB-729 (Three Mile Island). In addition, portions of these contentions, specified above, are totally redundant of other admitted contentions.

Contention 173. The essence of proposed contention 173 is that ". . . the SER (Section 8.2-1, pp. 8-1/8-2) fails to analyze common causes of failure of all power lines supplying Harris . . .". Applicants oppose admission of this contention on the ground that Mr. Eddleman has not satisfied the criteria of 10 C.F.R. § 2.714(a)(1) for admission of this late-filed contention and on the further ground that he has failed to satisfy the requirement of 10 C.F.R. § 2.714(b) of adequate basis with requisite specificity.

Contention 173 is clearly untimely and Mr. Eddleman has thus failed to establish "good cause" for its late admission. Catawba, supra, CLI-83-19, 17 N.R.C. 1041 (1983). Section 8.2 of Applicants' FSAR contains a detailed analysis of the offsite power system for the Shearon Harris plant. Virtually all of this analysis has been available since Amendment 2 was filed on March 31, 1982. The remainder of the relevant information was provided in Amendment 5 which was filed on April 3, 1983. Thus, Mr. Eddleman has had the opportunity and sufficient information for at least ten months to allege any deficiency in the offsite power system, or the analysis thereof. The SER adds no new information with respect to this system or Applicants' analysis thereof other than the Staff's conclusions in sections 8.2.1 and 8.2.4 that the offsite power system for the Harris plant meets General Design Criteria 5, 17, and 18 and, is, therefore, acceptable. As this Board has held, the

issuance of a Staff document containing Staff acceptance of Applicants' analysis does not give Mr. Eddleman a "second shot" at a contention when information sufficient to enable him to frame a contention was previously available. See Memorandum and Order (Ruling on Wells Eddleman's Contentions on the Staff Draft Environmental Statement), August 18, 1983, at 15-16.

In addition to the SER, Mr. Eddleman refers in his discussion of "WHAT'S NEW" to Applicant CP&L's "admission" on January 12, 1984 to the ACRS that CP&L has not ". . . analyzed common cause failure of power lines (other than tornado; probability estimated at 2×10^{-4} . . .). This so-called "admission" did not contain new information. CP&L merely reaffirmed what is apparent on the face of the FSAR -- that Applicants have not provided the NRC with a probability analysis of common mode failures of the seven transmission lines that will serve the Harris plant. CP&L provided the ACRS with an estimate of the probability of a tornado capable of a common mode failure of all seven lines in order to respond to a query by Dr. Kerr during the ACRS subcommittee review of the Harris operating license application on January 3-4, 1984. Dr. Kerr, while recognizing that such an analysis is not required under Commission regulations, expressed his interest in having some information on that subject and his opinion of its importance.

CP&L, accordingly, provided the information to which Mr. Eddleman refers during the full ACRS review on January 12, 1984.1/

In addition to the lack of good cause for the untimely filing of this contention, application of four of the remaining factors set forth in section 2.714(a)(1) argues against admission of Contention 173. First, as indicated above, the NRC Staff has examined the offsite power system and concluded that it meets applicable NRC regulations. Moreover, the ACRS specifically inquired about the Harris offsite power system, and in its favorable letter of January 16, 1984, the ACRS did not request any additional information on this subject. Thus, Mr. Eddleman's interest has been protected in another forum, i.e., through the Staff and ACRS review of the Harris operating license application. Moreover, Mr. Eddleman has asserted no technical expertise with regard to this matter and it is unlikely, therefore, that he could add anything meaningful to the evaluation already provided by the ACRS. Mr. Eddleman concedes that admission of this contention would broaden the issues in this proceeding and would result in at least some delay.2/

1/ A copy of the relevant portions of the transcripts of both the January 3-4, 1984 subcommittee meeting and the January 12, 1984 meeting of the full Committee is attached. See Attachment A.

2/ Mr. Eddleman argues here and elsewhere in support of his SER contentions that discovery on safety contentions is just beginning. This is not true. Discovery was available as of

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Upon balance, applicants believe that the criteria of section 2.714(a)(1) require rejection of Contention 173 at this late date.

Proposed Contention 173 is also inadmissible in that it lacks basis with requisite specificity. As stated above, the thrust of contention 173 is that neither Applicants nor the Staff has analyzed "common-cause failure" of all of the transmission lines which will provide offsite power to the Harris plant.3/ There is absolutely no requirement in the Commission regulations, however, that an applicant perform such an analysis. This proposed contention evidences a complete lack of understanding by Mr. Eddleman of the Commission's requirements with respect to, and the nature of, the offsite power system.

As stated in section 8.2.2.1 in the FSAR, the preferred power supply for the Harris plant is any two of the 230 kv lines serving the switchyard and the switchyard itself. The offsite power system is ot a safety related, Class 1E system.

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September 22, 1982. In February, 1983, the parties agreed to defer discovery on seven contentions (two Joint, one by Dr. Wilson and four by Mr. Eddleman). Discovery on ten other safety contentions proceeded. Moreover, discovery requests on safety issues are scheduled to end on March 15, 1984.

3/ Among the examples listed by Mr. Eddleman is included "transformer fires in the Harris switchyard." Applicants wish to point out that the transformers are not located in the switchyard.

IEEE Standard for Preferred Power Supply for Nuclear Power Generating Stations, Std. 765-1983 provides:

> 4.2 Safety Classification. The preferred power supply is not a Class 1E system. Requirements for redundancy, independence, separation, application of the single failure criterion, seismic, and equipment qualification, etc., which are associated with Class 1E installations, do not apply.

The regulatory requirements governing electric power systems, including the offsite power system, are General Design Criteria (GDC) 17 and 18. GDC 17 provides that the safety function for the offsite power system (assuming the on-site system is not functioning) is to provide sufficient capacity and capability to assure that plant systems important to safety perform as intended. GDC 17 then sets forth the means by which such assurance is to be provided. GDC 17 provides, in part:

> Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling

containment integrity, and other vital safety functions are maintained. (Emphasis added)

Thus, GDC 17 requires two independent circuits designed to minimize to the extent practical the likelihood of their simultaneous failure.

In section 8.2 of the FSAR, Applicants have provided a detailed explanation of the design of the offsite power system for Harris which, as the Staff has concluded, satisfies the requirements of GDC 17. Indeed, the Harris offsite system far exceeds those requirements. Section 8.2.1.1, states that the Harris plant will be served by a total of six 230 kv transmission lines. In fact, as CP&L advised the ACRS, a total of seven 230 kv lines will ultimately be available to the plant. Thus, the Harris offsite power system significantly exceeds the requirements of GDC 17 in this respect.

In section 8.2.1.1 of the FSAR, Applicants go on to describe the characteristics of the offsite system design which provide assurance of adequate capacity and capability to permit proper functioning of all safety-related equipment at the plant. These include design to withstand loadings due to maximum observed natural occurrences within the CP&L service area including lightning, ice storms and tornados. Moreover, Applicants have met the separation and independence requirements of GDC 17 by demonstrating in section 8.2.1.1 that a single transmission structure failure could remove no more than one other

transmission line from service. In addition, section 8.2.2.1 states that the CP&L transmission system is a part of the Eastern United States Power Grid which provides a high degree of reliability and availability to the CP&L system. In accordance with GDC 17, FSAR section 8.2.2.1 provides an analysis to demonstrate the adequacy of the transmission of CP&L and neighboring utilities to withstand:

a) Sudden loss of the entire generating capability at any plant.

b) Sudden loss of any large load or load center.

c) Sudden loss of all lines on a common right-of-way.

d) The delayed clearing of a three-phase fault at any point on the system to breaker failure.

e) The outage of the most critical transmission line caused by a three-phase fault during an outage of any other critical transmission line.

Based upon the information provided in the FSAR, the Staff has concluded in section 8.2 of the SER that the Harris offsite power system satisifes GDC 17 as well as GDC 5 and 18. Mr. Eddleman has not contended that the offsite system does not comply with GDC 17 or any other NRC regulation. Mr. Eddleman does make the broad unsupported statement that the SER's loss of Offsite Power Analysis at C-13 of the SER "depends on the accuracy of analysis in Section 8.2 of the SER" and that "that analysis is faulty." In view of the detailed analysis in the FSAR which is accepted in the SER, Mr. Eddleman was obliged to state with specificity what in that analysis is inadequate. He

points only to the purported "failure" to assess the probabilities of common mode failures which, of course, is not a requirement under the regulations. Mr. Eddleman has not made the requisite demonstration.

For the reasons set forth above, therefore, proposed Contention 173 must be rejected as untimely and as lacking basis with the requisite degree of specificity.

Contentions 174, 175, 176 and 177. Mr. Eddleman has proposed four new contentions on the adequacy of the Staff's Part 100 (seismology) analysis in the Shearon Harris SER. Applicants do not understand there to be any distinction among Contentions 174 through 177, each of which asserts that in view of a U.S. Geological Survey (USGS) letter of November 18, 1982, referenced in Appendix F to the SER, the Staff is required to analyze the impact on the Harris facility of a Modified Mercalli X intensity earthquake occurring at the site or closer to the site than Charleston, South Carolina.

Applicants object to the admission of Contentions 174 through 177. These contentions are untimely and, accordingly, fail to satisfy the "good cause" prong of the five part standard for admitting late-filed contentions. See 10 C.F.R. § 2.714(a)(1)(i). Applicants also oppose the admission of these seismology contentions because there is no evidence that Mr. Eddleman can make a valuable contribution to the record on this issue, which is being evaluated on a generic basis by the

Staff, and because these contentions will significantly expand the scope of the Harris plant operating license proceeding.

The Shearon Harris Draft SER, issued in January, 1983 and served on the parties, alerted Mr. Eddleman to the following facts:

(1) The NRC Staff holds the position that the relatively high seismic activity within the Coastal Plain Province in the vicinity of Charleston, S.C., including the 1886 MM Intensity X earthquake, is related to unique tectonic structure. Therefore, in the context of the tectonic approach, an MM Intensity X earthquake should not be assumed to occur anywhere else. Draft SER at 2-36, 2-41.

(2) Lacking definitive evidence, this NRC conclusion was based to a great extent on advice from the USGS. Id.

(3) The Charleston, S.C. region is presently under intensive seismological investigation by USGS. Id. at 2-36, 2-40.

(4) As a result of these studies, a great deal of information has been obtained, but the source mechanism of the seismicity still is not known. Id. at 2-36.

(5) Many working hypotheses are described in the Virgil C. Summer SER (1981). Id.

(6) Some of these theories postulate that the Charleston earthquake of 1886 could recur in areas of the

Piedmont and Altantic Coastal Plain in addition to the epicentral area. Id.

(7) The USGS clarified its position in a November 18, 1982 letter from James F. Devine to Robert E. Jackson, NRC. Id.

(8) The maximum earthquake "that shall be considered to occur near the Harris site" is not the Charleston 1886 earthquake, but an event with a maximum intensity of VII (MM) or a maximum magnitude of 5.3(mb). Id.

In sum, all of the facts which are the basis for Contentions 174 through 177 were stated very clearly in the Shearon Harris Draft SER one year ago. On the basis of the Draft SER, Mr. Eddleman was in a position to challenge the Staff's position not to use the Charleston earthquake in its tectonic province analysis of the maximum earthquake at the Harris site. While the substance of the November 18, 1982 UGSC letter was not provided in the Draft SER, Mr. Eddleman clearly was on notice of the letter's existence and, more importantly, of the ongoing investigation of the significance of the Charleston earthquake in NRC's seismology analyses.

In addition to the notice provided to Mr. Eddleman of this issue in the Draft SER, there are several other public documents which would have alerted Mr. Eddleman to the existence of this issue significantly prior to issuance of the final SER. A public meeting to discuss the Charleston Earthquake in the

context of eastern seismicity was held by NRC and USGS at which interested members of the public were invited to ask questions and raise concerns. This meeting was noticed in the Federal Register. See 47 Fed. Reg. 53538 (Nov. 26, 1982). At this public meeting, copies of the Nov. 18, 1982 USGS letter and of a Nov. 19, 1982 Memorandum from the Executive Director of Operations to the Commissioners on this subject were available. See Attachment B (transcript pages from meeting) and Attachment C (Nov. 19, 1982 EDO letter with attached Nov. 18, 1982 USGS letter).

Furthermore, the Catawba SER, issued in February, 1983, includes in Section 2.5 a discussion and excerpt from the November 18, 1982 USGS letter. The Catawba SER also explains that the "USGS clarification represents not so much a new understanding but rather a more explicit recognition of existing uncertainties with respect to the causative structure and mechanism of the 1886 Charleston earthquake." Catawba SER at 2-24. The information in the Catawba SER is the same information, some of which is referred to by Mr. Eddleman, contained in Section 2.5 and Appendix F of the Shearon Harris SER. Thus there is nothing new in the Shearon Harris SER, nor has the Staff's position on the use of the Charleston earthquake in its seismic analyses changed since the issuance of the Draft SER.4/

4/ While the Draft SER references the fact that the Staff will respond to the USGS letter in the final SER, Mr. Eddleman

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As a participant in an NRC licensing proceeding, Mr. Eddleman has an obligation to familiarize himself with publicly available information, such as the information described above, and to promptly formulate contentions that are based on this information. Catawba, supra, 17 N.R.C. at 1048. As stated above, "the institutional unavailability of a licensing-related document [such as the final SER] does not establish good cause for filing a contention late if information was available early enough to provide the basis for the timely filing of that contention." Id. Mr. Eddleman has failed to meet his obligation to file timely contentions on the Charleston earthquake. Consequently, he has not established "good cause" for the admission of Contentions 174 through 177. See 10 C.F.R. § 2.714(a)(1)(i).

Moreover, recognizing that there are other factors to be considered in evaluating the admissibility of late-filed contentions, Applicants believe three of the other four factors weigh heavily against admission of Contentions 174 through 177. There is no reason to expect that Mr. Eddleman's participation

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was obligated to formulate contentions which challenged the Staff position at the time of the Draft SER's issuance. In the event the final SER changed a Staff position taken in the Draft SER, then Mr. Eddleman's claim of new information would be appropriate. However, as discussed above, this was not the case in this instance.

will assist in developing a sound record on this issue. See 10 C.F.R. § 2.714(a)(1)(iii). Mr. Eddleman is not a geologist, nor does he contend that he will have any expertise available to him that will contribute to the extensive record on this generic issue that has been and continues to be developed by the Staff. Moreover, the Staff's continuing in depth consideration of this issue, which has applicability to all Eastern seaboard nuclear power plants, ought to protect Mr. Eddleman's interest, albeit outside the forum of this hearing. See 10 C.F.R. § 2.714(a)(1)(ii). See Shearon Harris SER at 2-30. In addition, as Mr. Eddleman admits, the admission of Contentions 174 through 177 would broaden the issues now being litigated. There is not now a seismology contention admitted in this proceeding. See 10 C.F.R. § 2.714(a)(1)(v). Consequently, litigation of this complex issue could and probably would be very time consuming.

In summary, under the test set forth by the Commission in the Catawba decision, CLI-83-19, Contentions 174 through 177 should be rejected by the Board.

Contentions 178 and 179. Contentions 178 and 179 challenge the adequacy of the Transamerica DeLaval, Inc. (TDI) diesel generators that will provide backup emergency power at the Harris site. The basis cited by Mr. Eddleman for these contentions is his receipt on December 19, 1983, of a December 1, 1983 letter from NRC to TDI that was served on the Harris

proceeding participants. Mr. Eddleman claims that before his receipt of the December, 1983 letter, he "had no solid basis to relate the TDI failure pattern directly to Harris." SER Contentions at 8.

Applicants object to the admission of Contentions 178 and 179. These contentions are not timely filed; consequently, Mr. Eddleman has not established "good cause" for their late admission at this juncture. Catawba, supra, CLI-83-19, 17 N.R.C. 1041 (1983); 10 C.F.R. § 2.714(a)(1)(i). In addition, Mr. Eddleman has not established any expertise in this field, the issues are being fully addressed by the Staff, and Contentions 178 and 179 unquestionably would broaden the issues already being litigated in this proceeding. See 10 C.F.R. § 2.714(a)(1)(ii)(iii) and (v).

The fact that Shearon Harris will use TDI emergency diesel generators is reflected in the Shearon Harris FSAR at Table 3.10.1-2, which was part of the FSAR as originally submitted in June 26, 1980. Table 8.3.1-8 of the FSAR indicates that the Harris diesel generators are the same model as the diesels being used at Grand Gulf Station Unit 1, at which some of the significant problems in this equipment have been discovered over the past two years. This Table was part of Amendment 5 to the FSAR, dated April 12, 1983.

More importantly, the potential applicability of certain of the generic TDI diesel generator problems to the Shearon

Harris TDI diesels is unequivocally clear from numerous public documents of which Mr. Eddleman should have been aware. The following documents are among those on the subject of TDI diesel generators available in the Public Document Room (PDR):

1.*	July 30, 1981	Part 21 notification from TDI to NRC (Inspection and Regulation) regarding potential valve spring problem in TDI diesel generators; explicit reference is made to Harris diesels
2.	December 9, 1981	Part 21 notification from TDI to NRC (Inspection & Regulation) regarding potential problem with TDI diesel generator governor lube oil cooler assembly; explicit reference is made to Harris diesels
3.	March 19, 1982	Part 21 notification from TDI to NRC (IE) regarding potential problem with TDI diesel generator sensing line between the starting air storage tank and the starting air compressor; explicit reference is made to Harris diesels
4.*	May 19, 1982	Letter from CP&L to NRC (Region II) transmitting Harris Unit 1 Interim Report on potential defect in pressure sensing line of TDI diesel generators
5.	June 23, 1982	Part 21 notification from TDI to NRC (IE) regarding potential problem with TDI diesel generator governor drive coupling; explicit reference is made to Harris diesels
6.*	October 28, 1982	Part 21 notification from TDI to NRC (IE) regarding potential defect in TDI diesel generator engine piston skirt casting; explicit reference is made to Harris diesels
7.*	July 14, 1983	Letter from CP&L to NRC (Region II) transmitting fourth Harris Unit 1 Interim Report on TDI diesel generator valve spring problem

8.	August 30, 1983	IE Information Notice No. 83-58 regarding TDI diesel generator crankshaft failure; explicit reference is made to Harris diesels
9.	September 21, 1983	Part 21 notification from TDI to NRC (IE) regarding potential problem with TDI diesel generator engine mounted fuel oil line; explicit reference is made to Harris diesels
10.*	December 14, 1983	Letter from CP&L to NRC (Region II) transmitting second Harris Unit 1 Interim Report on piston skirt problem in TDI diesel generators

* Astericked documents were available in the Shearon Harris docket, 50-400. The other documents were located in other facility dockets or, in the case of document #8, an NRC Information Notice, in a separate IE file. However, all of these documents are readily accessible by computer using TDI as the basis for such a document search.

The potential applicability of the identified TDI problems to the Harris site is unequivocally clear in all of these documents. Thus, while Mr. Eddleman personally may not have been aware of this information, a "solid basis to relate the TDI failure pattern to Harris" has existed for a long time. Consequently, there is no "good cause" for submission of these contentions at this late date.

In Contentions 178 and 179, Mr. Eddleman also refers to quality assurance problems with the TDI diesel generators. The following seven inspection reports of the TDI facility in Oakland, California are publicly available documents:5/ 79-1

5/ These documents can be located in the PDR under the docket number for QA vendor inspections of TDI.

(March 20, 1979); 80-01 (Jan. 22, 1981); 81-01 (May 27, 1981); 81-02 (Sept. 18, 1981); 82-01 (April 15, 1982); 82-02 (Dec. 8, 1982) and 83-01 (Oct. 3, 1983). Had Mr. Eddleman taken an interest in the subject of TDI diesel generators at an earlier date, he readily would have discovered these reports, which discuss the QA problems associated with the TDI diesel generators that are referred to by Mr. Eddleman in Contentions 178 and 179.

In addition to the absence of good cause for the late submission of Contentions 178 and 179, three of the other four factors that must be balanced in deciding whether to admit late-filed contentions support rejection of these contentions. See 10 C.F.R. § 2.714(a)(1). The generic consideration of this issue by the Staff will protect Mr. Eddleman's interest. See 10 C.F.R. § 2.714(a)(1)(ii). There is no reason to believe the admission of these contentions in this proceeding will in any way augment the NRC's continuing oversight of this issue, which is also the subject of a TDI owners' group verification program. See 10 C.F.R. § 2.714(a)(1)(iii). Certainly, the admission of Contentions 178 and 179 will significantly broaden the issues in this proceeding, with a corresponding increase in proceeding time to resolve all outstanding issues. See 10 C.F.R. § 2.714(a)(1)(v). Compare Mr. Eddleman's ridiculously circular assertion that the admission of Contention 179 "will not significantly broaden the issues since so many safety

issues are already admitted." SER Contentions at 9. Thus, although the issue of TDI diesel generators is not being pursued by any other intervenor in the proceeding, see 10 C.F.R. § 2.714(a)(1)(iv), a balancing of the five factors for determining whether to admit late-filed contentions clearly establishes that late-filed Contentions 178 and 179 should not be admitted.

Contention 180 cites the SER as a basis for the allegation that the ability to isolate the steam generators within thirty minutes in the event of steam generator tube ruptures is not established. Joint Contention VII, which is sponsored by Mr. Eddleman and which has been admitted by the Board, states in part:

> Applicants have failed to demonstrate that the steam generators to be used in the Harris Plant are adequately designed and can be operated in a manner consistent with the public health and safety and ALARA exposure to maintenance personnel in light of . . . (4) existing tube failure analyses.

Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference), LBP-82-119A, 16 N.R.C. 2069, 2077 (1982). The allegation raised in Eddleman 180 goes to Applicants' steam generator tube rupture analysis and therefore is encompassed by the above-quoted portion of Joint Contention VII.6/ Consequently, Applicants submit that Eddleman 180

6/ Applicants' counsel (Baxter) discussed this matter with Mr. Eddleman on January 30, 1984. Mr. Eddleman authorized Ap-

(Continued Next Page)

should be rejected as redundant. See id. at 2090, 2095 (Eddleman 1, 2, 29 and 30 rejected in whole or in part as redundant of Joint Contentions).

Contention 181 contends that the SER reveals that the Staff's review of control room design requirements is not complete due to Applicants not providing a program plan showing how each detailed control room design review (DCRDR) activity was accomplished and failing to address several areas and items in violation of NUREG-0737, Supplement 1 requirements for documentation.7/ SER Contentions at 10. Contention 181 as proposed by Mr. Eddleman relies on a number of erroneous conclusions drawn from the SER and is, therefore, lacking in technical basis and should be rejected by the Board.

First, the lack of detail in the SER is not due to any delay or default by the Applicants (there is none), but is simply a result of the timing involved -- the DCRDR was completed too close to the issuance of the SER to allow the DCRDR to be

---

(Continued)

plicants to report that he agrees that Eddleman 180 is covered by and redundant of part (4) of Joint Contention VII.

7/ Mr. Eddleman previously proposed control room design review contentions on January 8 and July 2, 1983. See Applicants' Response to Proposed Contentions on the Detailed Control Room Design Review (DCRDR) Proferred by Intervenor Wells Eddleman, July 29, 1983. Eddleman 132(C)(II), on this subject, was admitted by the Board. Memorandum and Order (Ruling on Wells Eddleman's Proposed Contentions Concerning Detailed Control Room Design Review . . .) at 8 (Oct. 6, 1983).

fully addressed therein. Advisory Committee on Reactor Safeguards (ACRS) 285th meeting, January 12, 1984, Transcript Vol. I at 186. The Staff plans to issue a supplement to the SER on this issue. Id.; see also SER at 18-2.

Second, Contention 181 states that the requirements of NUREG-0737, Supplement 1, have not yet been met. In fact, Applicants have addressed all relevant requirements, including the items referred to by Mr. Eddleman, and have continued to pursue those areas where questions may have arisen. Specifically, Mr. Eddleman cites the lack of a program plan showing how each DCRDR activity was accomplished and failure to address three areas set forth at page 18-2 of the SER. Those items are as follows:

> (1) a description of the process used to define control and display requirements and the basis for determining how control and display arrangements were made; also, a description of how the applicant will verify that the selection and arrangement of controls and displays and other equipment required during emergency operations will enable operators to effectively execute plant emergency operating procedures.
>
> (2) for items and areas in the control room not yet reviewed, an assessment and proposed corrective actions for HEDs identified at least 6 months before licensing
>
> (3) acceptable corrective actions and an implementation schedule for HEDs identified by the NRC audit (these will be addressed in more detail in the audit report that will be forwarded to the applicant when it is completed.

Contrary to Mr. Eddleman's Contention, both the program plan for accomplishment of DCRDR activities and item (1) above are addressed in a response to information requested by the NRC Staff after its DCRDR audit in August 1983. The information was provided to the NRC by letter to Mr. H. R. Denton dated September 27, 1983, a copy of which was sent to Mr. Eddleman. See Attachment D. If Mr. Eddleman found anything inadequate in this submittal, it was incumbent of him to say so. Catawba, supra. Not only did Mr. Eddleman not make a timely specific complaint, but his newly proposed Contention 181 utterly fails to address the specifics contained in the September 27 letter. The remaining two items set forth above call for action which necessarily cannot be taken until some future period -- "items and areas in the control room not yet reviewed," and corrective actions and implementation schedule for human engineering discrepancies (HEDs) identified by the NRC Staff Audit, which has not been published yet. See Memorandum and Order (Ruling on Wells Eddleman's Proposed Contentions Concerning Detailed Control Room Design Review . . .), October 6, 1983, at 12, 13 (the fact that the process is not complete yet provides insufficient basis for a contention); Memorandum and Order (Ruling on Wells Eddleman's Proposed On-Site Emergency Planning Contentions), November 1, 1983, at 11 (Contention 143). Applicants have addressed every aspect of DCRDR requirements to date and the NRC Staff has sought some further information from

Applicants but has never challenged the adequacy of any of Applicants' control room review. SER at 18-2.

It should be noted that CP&L actually conducted its DCRDR from April 1980 to January 1981. A summary report was issued January 23, 1981. SER at 18-1. Subsequently, since the SHNPP control room and Main Control Board (MCB) were not yet built, Applicants proceeded with changes to both control room and MCB layouts to improve human engineering aspects. All of this was prior to the issuance both of NUREG-0700 "Guidelines for Control Room Design Reviews," dated September, 1981, which provides guidance for the review, and NUREG-0737 Supplement 1 (December 1982). Id. CP&L submitted the summary report in December 1982, and provided additional information on the program plan to the NRC in June 1983. SER at 18-1. Finally, the NRC Staff conducted its DCRDR audit on August 15-19, 1983; however, the circumstances of the Staff review were unusual in that Applicants had already conducted their review prior to issuance of the NUREGs and then made changes thereto, id., and both the control room and MCB were not complete but were still under construction. Therefore, the Staff was not able to conduct its review of a finished plant as the guidance of NUREG-0700 would direct. Again, however, it must be emphasized that no discrepancies were found on which the Applicants had not already initiated corrective action.

Thus, Applicants have taken the initiative and conducted their human engineering review, including significant changes thereto, on their own with no official guidance or directives from the NRC. There has never been a challenge to the adequacy of Applicants' review -- only requests for further information, SER at 18-2, which is to be expected in a plant still under construction. Mr. Eddleman's assertion that Applicants fail "to assure adequate human factors design implementation at Harris" and indeed the entirety of proposed Contention 181 is totally without basis and should not be admitted in this proceeding.

Conclusion

For the reasons stated above, Applicants urge the Board to deny the Eddleman Motion, and to reject all of the new SER Contentions.

Respectfully submitted,

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Counsel for Applicants

Dated: February 6, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Answer to Wells Eddleman's Motion for Further Deferral of Parts of Contention 107 and to Wells Eddleman's New Contentions and Amended Deferred Contentions in Response to Staff SER" with attachments were served this 6th day of February, 1984, by deposit in the U.S. mail, first class, postage prepaid, to the parties on the attached Service List.

Thomas A. Baxter

Thomas A. Baxter, P.C.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

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MR. KERR: Does the committee want to hear a presentation on this, or do you want to ask questions? I'm going to suggest, Mr. Prunty, that we ask for questions and not ask for your formal presentation, if that is okay with you. Are there questions on AC/DC System Reliability?

We did explore this on the Subcommittee.

MR. EBERSOLE: What was that extremely low number I heard, about the AC power?

MR. PRUNTY: That was a number that considered independent failure of all seven lines, coming into the switchyard. It did not consider the common event, such as a major tornado or something. That has since be reevaluated and a probability number of something on the order of 2 times 10^{-4}, which is one occurrence approximately every 5,000 years, has been given as a common mode failure type mechanism in the switchyard.

The other one, though, was all the sequential seven lines failing for independent causes, one after the other.

MR. KERR: Any further questions?

(No response.)

Thank you, Mr. Prunty.

MR. OKRENT: Just a minute. Is 2 times 10^{-4} consistent with experience in the region for a loss of all offsite power?

MR. KERR: I haven't look at the region as such, but the number sounds low to me.

MR. ZIMMERMAN: Clarification, that's the tornado probability occurrence?

MR. PRUNTY: That's correct. That was an event that caused damage in the switchyard. It would completely destroy the shipyard.

MR. KERR: But the total loss is perhaps somewhat larger than that.

MR. OKRENT: It would have been helpful to get the full answer, I guess, rather than from only one of the common cause contributors.

MR. KERR: Further questions?

(No response.)

Thank you, Mr. Prunty.

That takes care of AC/DC. Emergency Planning is the next item. Since the Applicant has emergency plans for three other reactors, I'm going to suggest, if you like, that we handle this with questions, but a presentation is available.

MR. OKRENT: I have a question on DC. If they lose all AC, how long do they expect their DC to survive?

MR. ZIMMERMAN: Mr. Prunty will address that.

MR. PRUNTY: If we lose AC, how long with the DC system survive?

MR. OKRENT: Survive and perform vital functions.

MR. PRUNTY: Our evaluation of this considered design margin in the battery and the use of the design basis event loads, as per the FSAR. The number that was arrived at was on the order of six hours before battery failure. The actual load, during a blackout, would be less than those required to mitigate the effects of a design basis event, so we are something in excess of six hours.

MR. KERR: Further questions.

(No response.)

Thank you, Mr. Prunty.

I don't see any requests for a full scale presentation. Are there questions about emergency planning?

Mr. Moeller?

MR. MOELLER: This is more a question or a comment or suggestion to the Staff. In terms of emergency planning and the impacts of major accidents one can read the final environmental statement, which has the best information. On page 5-31, in the final environmental statement, I want to offer a suggestion. It says if a certain accident occurs, there will be so many cancer deaths in the surrounding population. And my suggestion is that the Staff, who or which, whichever word you use, does a good job on this -- that they consider adding the word excess cancer deaths or additional cancer deaths because the number you are giving would be the

MR. KERR: May we continue?

MR. BERLY: I'm Bob Berly, Manager of Transmission and Communications Planning Section. I will talk to you about the off-site AC power source, starting with the big picture and moving to the Harris site. Twenty-six transmission ties give the Eastern CP&L service area a grid strength of most of North America and part of Canada. In thecompany area, thousands of miles of well-planned, strongly designed 230 Kv transmission lines operate with high reliability.

There has never been a loss of availability of the total 230 Kv grid, nor has there ever been a total loss of availability of 230 Kv power to any nuclear or coal-fired plant served by this grid.

(Slide.)

Studies show complete adequacy with five lines serving Harris, but plans call for construction of seven lines, as shown on this slide.

MR. KERR: Excuse me, how long has the 230 Kv grid been in existence? I'm trying to get an idea of how long.

MR. BERLY: We built the first one 18 years ago. We've got over 2500 miles of 230 now.

MR. KERR: So we're talking about 18 years of history over which there has been no loss of power to any station?

MR. BERLY: There's been no loss of total 230 Kv

to any station served by 230, and that's about 10 plants.

MR. KERR: Thank you.

MR. BERLY: Any single line is capable of supplying all emergency safety equipment or startup load requirements. As you see, we have seven lines. Seven lines radiate from Harris in all directions. Parallelism is kept to a minimum. Cape Fear steam electric plant is located approximately 7 miles from Harris. It's a little hazy over here, but you see on the lefthand side of the drawing Cape Fear plant, and it can furnish sufficient power for Harris safety-related equipment.

In addition to fossile-fired units at Cape Fear, there are four IC turbines, two of which can be black started.

(Slide.)

An inverted breaker and a half, or double breaker, termination --

MR. KERR: Excuse me, those IC turbines at Cape Fear, --

MR. BERLY: Yes, sir, four turbines at Cape Fear. Two can be black started, two can be started in 20 minutes.

An inverted breaker and a half, a double breaker termination, is used for the generator, and all line terminations in the [illegible] switchyard.

[illegible]y of two 230 Kv main buses is provided. Breakers are [illegible]ent pole tripping, and their design permits full, [illegible]te open/closed operations without operation

of the air compressor. Redundancy is provided in protective relay and control circuits, and in battery power capability.

This concludes my formal presentation.

MR. KERR: I believe I read that there were two separate batteries available for switchgear operation in your switchyard.

MR. BERLY: There are two batteries available for each control circuit in those ones there.

MR. KERR: Are those batteries seismically qualified?

MR. BERLY: I can't answer that.

MR. ZIMMERMAN: We can find that out.

MR. KERR: Are there other questions?

(No response.)

Incidentally, in your decision on emergency power, did you attempt to calculate or estimate the probability of loss of off-site -- all off-site power at Harris?

MR. BERLY: With respect to transmission, yes, sir.

MR. KERR: What is the probability number at which you arrived?

MR. BERLY: For all seven 230 Kv lines, it's 1.53 times 10^{-33}.

MR. KERR: Wait a minute. 1.53 times 10 -- only three significant figures?

(Laughter.)

10^{-33} per year?

MR. BERLY: This is related to loss because

independent causes.

MR. KERR: I'm interested in the probability of loss. I just wondered if you tried to calculate it, if any of your decisions were based on an attempt to estimate that number.

MR. BERLY: The best we considered to be such a high measure of reliability, so it really couldn't determine our design.

MR. KERR: I recognize that the 10^{-33} has nothing in the realm of possibility. I'm trying to find out whether you attempted to estimate a real number and used it in your decision-making process at all.

MR. BERLY: No, sir.

MR. KERR: I'm a little puzzled that you did not, since I think --

MR. BERLY: I was going to say we have information relative to outage records on the lines, which we did use in designing the system, and that indicates less than one hour interruption per hundred miles per year in the 230.

MR. KERR: I raised the question because I think it's important that you have AC available for many of the things that you might need to do in an emergency. I don't think that's news to you or anybody else.

It therefore seems to me some understanding of what the reliability of the off-site power is is needed, in order

that you make a decision as to whether the on-site power, emergency power reliability, is appropriate.

MR. BERLY: We consider it highly reliable in that we do radiate in different directions.

MR. KERR: What would you be willing to accept as a failure probability for all off-site power? Once in 10 years, once in 100 years, once in 1000 years?

MR. BERLY: I guess we're talking maybe in the range of once in 100 years or 200 even. It's very remote.

MR. KERR: Okay. If you, for example, are willing to talk about once in 100 years being off for, say, an hour, that means that you need a fairly reliable on-site source. Did you use numbers like that to decide on the appropriate reliability of your on-site source?

MR. BERLY: Let me back up and ask -- are we saying the probability of all seven lines being out?

MR. KERR: I don't care how you get the AC power to your plant.

MR. BERLY: All we use is one line.

MR. KERR: I'm saying have you estimated the probability that you would lose all off-site sources of AC, so that you would have to use your emergency on-site source?

MR. BERLY: No, sir.

MR. KERR: It would seem to me that a utility would want to do this, given the importance of having AC available.

But if you haven't, you haven't. It certainly is not a requirement of any of the regulations. I am looking toward the day when utilities don't find themselves restricted by the regulations but make decisions based on what they think ought to be done, and I'm sure you do that. But it seems to me this is a pretty crucial area.

MR. BERLY: We considered it so remote, I guess we didn't consider it as a possibility.

MR. KERR: A remoteness of once in 100 years is fairly high compared to, for example, the calculations that EPRI have made and the numbers that they have used. Have you looked at their numbers?

MR. BERLY: No, sir.

MR. KERR: Well, I would urge that you do.

MR. BERLY: Shall I go on?

MR. KERR: Yes, sir.

end 8

MR. ZIMMERMAN: Dr. Kerr, you asked about the seismic qualification of the batteries. They're not seismically qualified.

MR. KERR: Thank you.

MR. PRUNTY: Good morning, my name is Bob Prunty, I'm principal electrical engineer in the Harris Engineering Section out at the Harris site.

(Slide.)

I'm going to address the on-site AC and DC distribution systems and follow that up with a discussion of station blackout.

Shearon Harris on-site power system consists of multiple independent power sources, an arrangement of interconnecting busses and redundant independent safety trains that insure maximum reliability and diversity.

The safety-related portion includes two diesel generators, two 6.9 Kv safety buses, several 480 volt buses, two 125 volt DC batteries and their associated charges which supply two DC buses and four 120 volt AC uninterruptable buses.

The two 6.9 Kv emergency buses supply all the safety-related loads. Normal source of power is the main generator, and the unit's auxiliary transformer. The unit auxiliary transformer is shown here supplying power to the auxiliary buses and hence, to the 6.9 Kv safety buses located here (indicating) one A-SA, one B-SB.

Attachment B

OFFICIAL TRANSCRIPT
PROCEEDINGS BEFORE

NUCLEAR REGULATORY COMMISSION

U. S. GEOLOGICAL SURVEY

DKT/CASE NO.

TITLE MEETING TO DISCUSS THE NRC CHARLESTON EARTHQUAKE IN THE CONTEXT OF EASTERN SEISMICITY

PLACE RESTON, VIRGINIA

DATE NOVEMBER 30, 1982

PAGES 1 - 220

ALDERSON REPORTING

(202) 628-9300
440 FIRST STREET, N.W.
WASHINGTON, D.C. 20001

MR. JACKSON: I think I'll give it back to Jim, because you pointed the question back to him. But let me make an attempt first.

In terms of introduction before your question, we have issued, for those here who are not aware, upon receipt of the USGS letter we wrote what is called or termed a Commission paper, and this is a paper which advises the Commissioners themselves of significant actions that have taken place. This was issued under the Executive Director of Operations' signature late in the afternoon or early the following morning of receipt of the letter.

A Commission meeting was then held that afternoon, which was Friday afternoon -- I can't recall the date right now -- a week ago last Friday. There are copies of this document out on the table if they're not already all gone. And attached to that also is a copy of the USGS letter and our proposed plan of let's say an outline for NRC approach to resolving this issue.

Now, I think that one of the problems we have is that Charleston earthquake occurring at Charleston is more or less an artifact of the licensing process. I don't think it has ever been and I've never heard any scientist consider the fact that we restrict Charleston to Charleston being a scientific truth. It is really

Attachment C

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November 19, 1982

FOR: The Commissioners

FROM: Executive Director for Operations

SUBJECT: CLARIFICATION OF U. S. GEOLOGICAL SURVEY POSITION RELATING TO SEISMIC DESIGN EARTHQUAKES IN THE EASTERN SEABOARD OF THE UNITED STATES

PURPOSE: To provide the Commissioners with information relating to the clarification of the U. S. Geological Survey Position with respect to the 1886 Charleston, S.C. Earthquake reoccurrence

DISCUSSION For the purpose of licensing of facilities in the Southeastern U. S., the NRC has taken a position, based primarily on the advice of the U.S. Geological Survey (USGS), that any reoccurrence of the 1886 Charleston, S.C. earthquake (Modified Mercalli Intensity (MMI) X, estimated Magnitude about 7) would be confined to the Charleston area. That is, the Charleston earthquake is assumed to be associated with a geologic structure in the Charleston area. Nuclear power plants in the region east of the Appalachian Mountains are, therefore, usually controlled in their seismic design, according to Appendix A to 10 CFR Part 100, by the maximum historical earthquake not associated with a geologic structure. This controlling earthquake is typically an MMI VII or VIII. Since 1974, the NRC has funded an extensive research project in the Charleston area to gain further information on the causative mechanism of this event.

On January 28 and 29, 1982 the Extreme External Phenomenona Subcommittee of the ACRS convened a meeting of expert professionals in the geosciences to obtain an overview of the state of knowledge and future NRC research needs in this area. During that meeting, we were informed by the USGS that it had formed a working group to reassess the validity of its position on the Charleston earthquake.

Contact:
R. Vollmer, NRR
492-7207

This information was conveyed to the Commissioners in a Commission Information Paper (SECY-82-53) on February 5, 1982. In that paper we indicated that any major modification of the former USGS position could have significant impact on many Eastern U.S. nuclear plant sites.

After many months of deliberation, the USGS has clarified its previous position relating to the 1886 Charleston, S.C. earthquake. The attached letter, James F. Devine, USGS, to Robert E. Jackson, NRC, November 18, 1982 provides the position and indicates that:

> "Because the geologic and tectonic features of the Charleston region are similar to those in other regions of the eastern seaboard, we conclude that although there is no recent or historical evidence that other regions have experienced strong earthquakes, the historical record is not, of itself, sufficient grounds for ruling out the occurrence in these other regions of strong seismic ground motions similar to those experienced near Charleston in 1886. Although the probability of strong ground motion due to an earthquake in any given year at a particular location in the eastern seaboard may be very low, deterministic and probabilistic evaluations of the seismic hazard should be made for individual sites in the eastern seaboard to establish the seismic engineering parameters for critical facilities."

Based on our discussions with USGS senior personnel, this clarification is not intended to recommend that we categorically consider a Charleston-type event in the seismic design of all nuclear plants in the eastern seaboard of U.S. The USGS does believe, however, that an earthquake of this size should not be categorically ruled out at locations away from Charleston based solely on the statement in the December 30, 1980 USGS letter which states, "Consequently, earthquakes similar to the 1886 event should be considered as having the potential to occur in the vicinity of Charleston and seismic engineering parameters should be determined on that basis." Instead, this clarification provides guidance that indicates that such a conclusion should be reached only after deterministic and probabilistic evaluations of the seismic hazard for individual sites have been made.

Our evaluation of the significance of this clarification has only just begun. Currently, a two day review meeting between NRC (ORES and ONRR) and the USGS is planned for November 30, 1982 and December 1, 1982 to discuss both the status of geoscience knowledge in the Charleston region and future research efforts. The first day will be an open public meeting (noticed in the Federal Register) which will allow for comments and questions from interested parties and members of the public.

We have also attached our preliminary views on a plan to address this clarified USGS position. This plan includes elements which relate to both ongoing research and licensing efforts and possible requirements for new efforts (split approximately 75% and 25% respectively). This plan will be modified and completed after several meetings with the USGS take place in order that a more complete understanding of its clarified position can be obtained.

(Signed) William J. Dircks

William J. Dircks
Executive Director for Operations

Attachments:
As stated

DE:GSB
LReiter
11/18/82

DE:GSB
SBrocoum
11/19/82

OFFICE	DE:GSB	DE:AD:C&SE	DE:D	ORES	NRR	NRR	
SURNAME	TEJackson:sl	SPKnight	RHVollmer	RBMinogue	EGCase	HRDenton	
DATE	11/18/82	11/19/82	11/19/82	11/22/82	11/5/82	11/3/82	

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United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
Mail Stop 905

NOV 18 1982

Dr. Robert E. Jackson
Chief, Geosciences Branch
Division of Engineering
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Bob:

The purpose of this letter is to clarify our position on the seismic potential of certain regions of the Eastern United States. In our letter of December 30, 1980, on the same subject we expressed the view that ". . . the likelihood of a Charleston sized event in other parts of the Coastal Plain and Piedmont is very low."

As you are aware, after several years of intensive study in the Charleston region, no geologic structure or feature can be identified unequivocally as the source of the 1886 Charleston earthquake. However, as studies in the Charleston region and elsewhere along the Atlantic margin have progressed, it has become evident that the general geologic structure of the Charleston region can be found at other locales within the eastern seaboard (Appalachian Piedmont, Atlantic Coastal Plain, and Atlantic Continental Shelf).

Because the geologic and tectonic features of the Charleston region are similar to those in other regions of the eastern seaboard, we conclude that although there is no recent or historical evidence that other regions have experienced strong earthquakes, the historical record is not, of itself, sufficient grounds for ruling out the occurrence in these other regions of strong seismic ground motions similar to those experienced near Charleston in 1886. Although the probability of strong ground motion due to an earthquake in any given year at a particular location in the eastern seaboard may be very low, deterministic and probabilistic evaluations of the seismic hazard should be made for individual sites in the eastern seaboard to establish the seismic engineering parameters for critical facilities.

As stated in our letter of December 30, 1980, earthquakes similar to the 1886 Charleston, South Carolina, event should be considered as having the potential to occur in the vicinity of Charleston and seismic engineering parameters of critical facilities in that area should be determined on that basis.

Sincerely yours,

James F. Devine
Assistant Director for
Engineering Geology

Outline for Recommended Plan
Eastern U. S. Earthquakes

Introduction

Based on our preliminary assessment of the U. S. Geological Survey's (USGS) clarification of position relating to a Charleston-type earthquake, we do not see a need for any immediate action for specific sites at this time. Instead, we foresee that this clarification can be addressed predominantly through existing ongoing programs at NRC with the possibility of additional requirements for work by the Utilities.

The USGS clarification indicates that deterministic and probabilistic evaluations should be made. Generally, for most existing sites, extensive deterministic studies have been undertaken and used in developing the existing seismic design basis. We therefore believe that this element of the clarification continue to be addressed through our long range research plan. Specific modifications to that plan can be made in order to address specific tectonic structures. If necessary, a few specific applicants or licensees may be required to investigate tectonic structures which may not have been previously identified during the licensing procedure.

As many of the current working deterministic hypotheses are not directly amenable to investigation in the short term, we believe that the clarification issue should be pursued in the short term principally through a probabilistic assessment of plants in the eastern seaboard. This probabilistic program can be coupled to the current ongoing NRC efforts in this area already underway. We also believe that utility-sponsored studies should be undertaken, preferably as a consolidated group, to assess the seismic hazard in the eastern seaboard.

Further specifics on this program will be provided after more extensive discussions with the USGS.

PROBABILISTIC EVALUATION:

In our view, the USGS clarification represents not so much a new understanding but rather a more explicit recognition of existing uncertainties with respect to the causative structure and mechanism of the 1886 Charleston earthquake. Many hypotheses have been proposed as to the locale in the eastern seaboard of future Charleston-size earthquakes. Some of these could be very restrictive in location while others would allow this earthquake to reoccur over very large areas. Presently, none of these hypotheses are definitive and all contain a strong element of speculation.

Traditional deterministic approaches are not generally designed to deal with this situation. Probabilistic methods which allow for the consideration of many hypotheses, their associated credibilities, and the explicit incorporation of uncertainty are much better equipped to provide rational frameworks for decision making. We believe that the

probabilistic approach described below, which takes into account the uncertainties, should be used to determine differences (if any) between seismic hazard levels associated with seismic design values in the eastern seaboard (i.e. as affected by the USGS clarified position on the Charleston Earthquake) and seismic hazard levels associated with seismic design values elsewhere in the central and eastern U. S.

Probabilistic Plan

1. Continue development of Lawrence Livermore National Laboratory (LLNL) study on seismic hazard (probability of exceedance) for nuclear power plants east of the Rocky Mtns. This study (Seismic Hazard Characterization of the Eastern United States) is presently underway.

2. Compare of LLNL study with existing probabilistic studies (for example USGS Open File Report 82-1033) and other ongoing NRC Research into probabilistic seismic estimation.

3. Sponsorship by the industry as a whole of a probabilistic estimation of hazard for all nuclear plants on the eastern seaboard, along with existing studies for individual plants.

4. Make comparisons between plants in the eastern seaboard and other parts of U.S. using the LLNL and other studies to determine significant differences (if any) in seismic hazard associated with seismic design.

5. Integration of above into Systematic Evaluation Program-type evaluation for possible engineering reanalysis.

DETERMINISTIC EVALUATION:

Deterministic studies in response to the USGS clarification should continue to be oriented toward determining the causal mechanisms of the earthquake under NRC's existing research program. These studies should involve systematic testing of the several hypotheses of the causative structure of the Charleston earthquake and investigations in areas of high seismicity and designated areas of potential seismicity for additional evidence of the cause. The type of studies most likely to lead to a better understanding of the causes of seismicity in the eastern seaboard of the United States are neotectonic investigations (recent crustal motions and seismicity) coupled with examination of crustal structure:

These deterministic studies are basically four types:

1. The continuation of seismological research through the operation of the existing micro-earthquake networks and the development of a strong motion data base.

2. The determination of the geometry of structure and tectonics of the earth's crust at depths where earthquakes are occurring (5-20 km) in the eastern seaboard using such techniques as seismic reflection profiling.

3. The continuation of subsurface neotectonic investigations of earthquake source areas to determine if uplift, subsidence or differential movement is occurring. Such studies may include among others:

   A. Tectonic Geomorphology
   B. Geodetic Measurements
   C. Geologic Mapping
   D. Remote Sensing

Attachment D

SERIAL: LAP-83-426

September 27, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2
DOCKET NOS. 50-400 AND 50-401
SUPPLEMENT 1 TO NUREG-0737 - DETAILED CONTROL ROOM DESIGN REVIEW

Dear Mr. Denton:

On August 15-19, 1983, the NRC staff conducted a Detailed Control Room Design Review audit of Carolina Power & Light Company's (CP&L) Shearon Harris Nuclear Power Plant (SHNPP) Units 1 and 2 control rooms. During the audit, your staff requested the following additional information to complete their review on Section 5 of Supplement 1 to NUREG-0737:

1. A description of the system's functional analysis performed on the SHNPP Unit 1 Main Control Board during its redesign (Attachment 1),

2. A description of the method and a general target date for completion of the Task Analysis of the plant specific Emergency Operating Procedures, (Attachment 2) and;

3. A description of the Development, Verification and Validation process for emergency operating procedures (EOPs) and a general target date for completion (Attachment 3).

We trust this submittal provides the information your staff needs. Should you require clarification of the information provided, please contact my staff.

Yours very truly,
ORIGINAL SIGNED BY
M. A. McDUFFIE

M. A. McDuffie
Senior Vice President
Nuclear Generation

MSG/tda (7896MSG)
Attachments

cc: Mr. B. C. Buckley (NRC)
Mr. G. F. Maxwell (NRC-SHNPP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. Travis Payne (KUDZU)
Mr. Daniel F. Read (CHANGE/ELP)
Mr. R. P. Gruber (NCUC)
Chapel Hill Public Library
Wake County Public Library
Mr. Wells Eddleman
Dr. Phyllis Lotchin
Mr. John D. Runkle
Dr. Richard D. Wilson
Mr. G. O. Bright (ASLB)
Dr. J. H. Carpenter (ASLB)
Mr. J. L. Kelley (ASLB)

ATTACHMENT 1
CAROLINA POWER AND LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT (SHNPP) - UNIT NO. 1
SYSTEMS FUNCTIONAL ANALYSIS PERFORMED ON THE
MAIN CONTROL BOARD DURING REDESIGN

Introduction

Carolina Power & Light Company's (CP&L) Shearon Harris Nuclear Power Plant (SHNPP) Unit 1 Main Control Board (MCB) was redesigned during January through March of 1981, based upon a Human Factors Review performed by Essex Corporation of Alexandria, Virginia, using Draft NUREG-CR/1580 criteria. The Human Factors (HF) Review identified 134 Human Engineering Discrepancies (HEDs); 49 of the HEDs were considered significant. These 49 HEDs concerned grouping and sequencing of controls, displays, light boxes, and annunciators. All 49 of these discrepancies were resolved with the redesign of the MCB.

The redesign and functional analysis were performed by CP&L engineering, operations, training, industrial engineering, and Essex Corporation personnel. Assistance from both the Architect-Engineer (Ebasco) and the Nuclear Steam System supplier (Westinghouse) was provided as needed.

Functional Analysis

Carolina Power & Light Company's design philosophy for the MCBs dictates the placing of controls on the bench section, indicators with light boxes (such as Status Light Boxes (SLBs) and Monitor Light Boxes (MLBs)) on the vertical section, and annunciators on the top tilted section of the MCB. Experience has proven that this philosophy is both practical and effective. This design philosophy allows the Control Operator to perform administrative duties at his desk while still maintaining the ability to scan the MCB to determine plant status. It also allows the Shift Foreman and other plant personnel to determine plant status from a distance, outside of the primary operating area, without interfering with the Control Operator. During the redesign process, CP&L established conventions for the MCB redesign effort.

The conventions chosen are as follows:

1. Bottom to top layout based upon the physical layout (from Piping and Instrumentation Diagrams (P&IDs)).

2. Layouts that must be horizontal will be left to right with appropriate demarcation lines or arrows to clearly indicate the system flow.

3. Series flow will be indicated by placing controls (and displays if possible) directly above each other from bottom to top, OR arrows or lines and arrows will be utilized to denote system flow.

4. Parallel flow will be indicated by placing controls (and displays if possible) side by side with "A" or "1" (if applicable) on the left and "B" or "2" (if applicable) on the right.

5. Common suction or discharge (header) will be denoted with a solid bar, as necessary, to clarify the arrangement.

6. Demarcation lines will be used to separate control display groups.

7. Demarcation lines or lines and arrows will be used where system flow is not obvious by components arrangement i.e., memic or partial memic.

8. Summary labels and brackets will be utilized to clarify the arrangement.

9. Indicators will be placed in the order they physically appear in the system. If this is not practicable, indicators for level, pressure, flow, and temperature will be placed in this order (preferably from left to right (first choice) or bottom to top (second choice)).

10. Recorders on the MCB will be placed on the vertical section at a level (height) where they can be easily read and maintained.

During the HF Review process, we determined which unnecessary components could be removed from the MCB. This review and subsequent determination was based upon design philosophy, operational need, operating experience, staffing, operating philosophy, and our decision to provide an advanced computer system. Our review culminated in the removal of approximately 200 controls and displays and approximately 250 annunciators from the MCB. In addition, concurrence for removal of components from the MCB was sought and obtained from both Ebasco and Westinghouse.

A review of MCB systems locations of the current design (i.e. prior to January 1981), revealed extensive thought and logic had been applied to systems locations. Generally, the systems location on the MCB remained unchanged during the redesign. A detailed review of each system, the method of which will be described later, revealed some components not properly located within their respective system and indicated arrangement of components within each system could be improved to facilitate operation. Different methods of arranging components such as frequency of use, like components (pumps, valves) grouping, modes of operations, and arrangement of physical layout (from P&IDs) were evaluated. The physical layout method was chosen because: 1) it was more practicable from an operations standpoint, 2) this is how our operators learn plant systems, and; 3) systems have many different operating modes where sequences of operation vary.

The redesign began by constructing a quarter scale, single plane mock-up on cardboard, utilizing the same dimensions and MCB shape as a standard "D" sized engineering front panel view drawing of the MCB. The cardboard mock-up with the MCB panel outline was then covered with clear plastic. A set of the current design (i.e. prior to January 1981) front panel drawings was then utilized by cutting out each component, pasting it to a piece of the same type cardboard and applying "stick-um" which would allow the component to be removed for rearrangement. Each component was then attached to the mock-up to reflect the current design. String was stretched across the mock-up to indicate primary and secondary viewing heights.

The redesign team was provided an oral description of each system, prior to the system rearrangement, by operations personnel which included system function (and how that function interrelated with the overall operation of the plant), the physical layout, and the instrumentation included in the design to accomplish the function. Each control, display, and other indications located on the MCB was then marked on the system P&ID. The controls and displays were then arranged on the mock-up, utilizing the (P&ID) and the conventions previously outlined. Demarcation lines were then added to the mock-up and the necessary labeling was determined. Exact labeling was cross-referenced to the mock-up with a numbering system because labeling would not fit on the mock-up.

Annunciators were rearranged into groups according to their applicable system by cutting and pasting drawings. Where possible, the annunciators were arranged bottom to top in relation to their respective components or sensor input in the physical layout. In cases where this annunciator arrangement was not practicable, the annunciators were logically grouped by function.

Next, all Status Light Boxes, Monitor Light Boxes, Trip Status Light Boxes, the Bypass Light Box, and the Engineering Safety Features (ESF) Light Boxes were reviewed for logical groupings by either system or function. These light boxes were then rearranged into logical groupings by cutting and pasting the drawings.

As panel sections of the MCB redesign were completed and translated to engineering drawings, Ebasco and Westinghouse (which included the appropriate disciplines), the review team and other CP&L personnel held review meetings where the redesign was evaluated. Comments were incorporated and the redesign was implemented.

Adequacy of instrumentation was continually evaluated by the team throughout the redesign process. In several cases, additional instrumentation was needed to accomplish systems functions. The additional instrumentation was added to the drawings during the redesign process.

As a result of our redesign effort and continual review process, CP&L believes the SHNPP Unit 1 main control board is a well designed, operationally functional, and Human Factored Control Board.

ATTACHMENT 2
CAROLINA POWER AND LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT (SHNPP) UNIT NOS. 1 AND 2
TASK ANALYSIS OF THE UPGRADED
EMERGENCY OPERATING PROCEDURES (EOPs)

Introduction

Carolina Power & Light Company's (CP&L) April 15, 1983 response to Supplement 1 of NUREG-0737 for the Shearon Harris Nuclear Power Plant (SHNPP) Unit Nos. 1 and 2 stated our Emergency Operating Procedures (EOP's) Procedures Generation Package (PGP) would be submitted to the NRC nine months prior to fuel load. The PGP will provide plant-specific technical guidelines, a Writer's Guide, and a description of our verification and validation program. Operator training will be accomplished prior to SHNPP Unit 1 fuel load which is currently targeted for June 1985. Carolina Power & Light Company anticipates completing the EOP Task Analysis concurrent to submittal of the PGP.

Task Analysis Method

A Task Analysis has been performed on the High-Pressure (HP) Basic version of the Westinghouse Owners' Group (WOG) Emergency Response Guidelines (ERGs) by a working group under the purview of the WOG Procedures Subcommittee. The primary outputs of this generic Task Analysis are tables listing all Instruments and Controls utilized in performing the ERGs. The detail of the generic Task Analysis is consistent with the detail provided in the generic ERGs.

The generic Task Analysis utilized a top-down approach that identifies the guidelines (i.e., event sequences), plant systems utilized in responding to event sequences, operator functions and operator tasks performed in responding to event sequences, and detailed elements that comprise the operator tasks. Figure 1 illustrates this approach.

As a minimum, CP&L intends to identify the deviations from the generic ERGs for the SHNPP-Unit 1 EOPs, task analyze those differences and generate plant specific lists of Instruments and Controls necessary to perform the EOPs in the SHNPP-Unit 1 control room. Figure 2 describes this approach. These Instruments and Controls listings will then be compared to control room instruments and controls to identify missing components or needed components not included in the design.

Additionally, CP&L will review the generic Task Analysis along with the ERGs deviations analysis, thus insuring review of each step of the SHNPP-Unit 1 EOPs. Discrepancies identified during the review and analysis will be judged applicable to the EOPs, Control Room or both and will be resolved and corrected by us. We believe that no major discrepancies will be identified because of our extensive functional analysis performed during the SHNPP-Unit 1 MCB redesign process and because of the task analysis performed on the event-based procedures during the Control Room Design Review.

ATTACHMENT 3
CAROLINA POWER AND LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT (SHNPP) UNIT NOS. 1 AND 2
DEVELOPMENT, VERIFICATION AND
VALIDATION OF EMERGENCY OPERATING
PROCEDURES

Development:

Carolina Power and Light Company's (CP&L) Shearon Harris Nuclear Power Plant (SHNPP) Emergency Operating Procedures (EOPs) are currently being developed utilizing the Westinghouse Owners' Group (WOG) Emergency Response Guidelines (ERGs) High Pressure (HP) version, Revision 1, as Technical Guidelines. The EOPs will follow the ERGs as closely as possible and any deviations will be documented, explained, and/or justified. Documentation will also be generated for the basis of the plant-specific calculations called for in the generic guidelines.

The basic version of the WOG ERGs have undergone one week of simulator verification and validation testing. A program for a week of simulator verification and validation testing of Revision 1 of the ERGs is now being assembled by Westinghouse and will be performed during the week of October 31 - November 4, 1983.

Carolina Power & Light Company has been deeply involved in the development of the ERGs since their inception through participation in both the full Owners' Group and the Procedures Subcommittee.

Verification and Validation Methods

Tabletop Evaluations

Tabletop evaluations will be performed on all EOPs and will consist of a talk-through of the procedures by qualified operations personnel and members of the team responsible for developing the EOPs. Scenarios will not be utilized during the tabletop evaluation. The evaluation will be documented as to time and date of performance, personnel involved, procedures utilized, problems or suggested improvements noted and, later, the solution of those problems or suggested improvements. The evaluation criteria utilized during the tabletop exercises are:

1. EOPs are technically correct.

2. EOPs are understandable as written.

3. EOPs are written in conformance with the Writer's Guide.

4. Level of detail in the EOPs is consistent with the qualifications, training, and experience of the operating staff.

Tabletop evaluations will be held in the spring of 1984.

Control Room Walk-Through

The Control Room Walk-Through will consist of walking and talking through each EOP in the Control Room with a full operations staff complement. Scenarios will not be utilized in the walk-throughs. A member of the team responsible for developing the EOPs will lead the walk-through. The walk-through will be documented as to time and date of performance, personnel involved, procedures utilized, problems or suggested improvements noted, and later, the resolution of those problems or suggested improvements. In addition to the criteria utilized in the tabletop evaluations, three additional criterion will be utilized in the walk-through. These criterion are:

1. Control room staff size is adequate to carry out the actions in the EOPs.

2. Instruments and controls necessary to carry out the EOPs actions are available.

3. Operators can carry out the EOPs actions without physical interference.

The walk-throughs cannot be carried out at SHNPP until the Control Room is functional (where functional is defined as):

1. Structurally completed (ceiling, lighting, and HVAC installed; panels correctly and permanently placed; etc.)

2. All instruments and controls installed but not necessarily operable.

3. Manned with a full operations shift complement.

We expect the SHNPP Unit 1 Control Room to be functional in late 1984 or early 1985. The walk-throughs are being planned for this time frame.

Simulator Evaluations

The simulator evaluation will consist of utilizing the SHNPP simulator to dynamically test the EOPs with accident scenarios. Testing of two eight-hour shifts, where preselected scenarios will be imposed on a full complement operating crew using the EOPs, will be performed at the SHNPP simulator. This testing is judged as adequate because:

1. SHNPP EOPs are very similar to H. B. Robinson Unit 2 (HBR) EOPs and the results of the HBR testing (which will be completed first) will be input to the SHNPP EOP's development.

2. The HBR EOPs have undergone 75 hours (as of September 1983) of dynamic testing at the SHNPP simulator.

3. Many of the same personnel involved in the development and testing of the HBR EOPs will be involved in the writing and testing of the SHNPP EOPs.

The simulator evaluations will be documented as to the time and date of performance, personnel involved, procedures utilized, scenarios selected, expected path through the EOPs, actual path through the EOPs with deviations explained, operators' debriefing critiques, observers' critiques, problems or suggested improvements noted, and later, resolution of those problems or suggested improvements.

The simulator exercises will be oriented toward the practical performance of the EOPs and is expected to be performed in the mid- to late-1984 time frame.

(7896MSGtda)

SYSTEM REVIEW AND TASK ANALYSIS DEVELOPMENT APPROACH

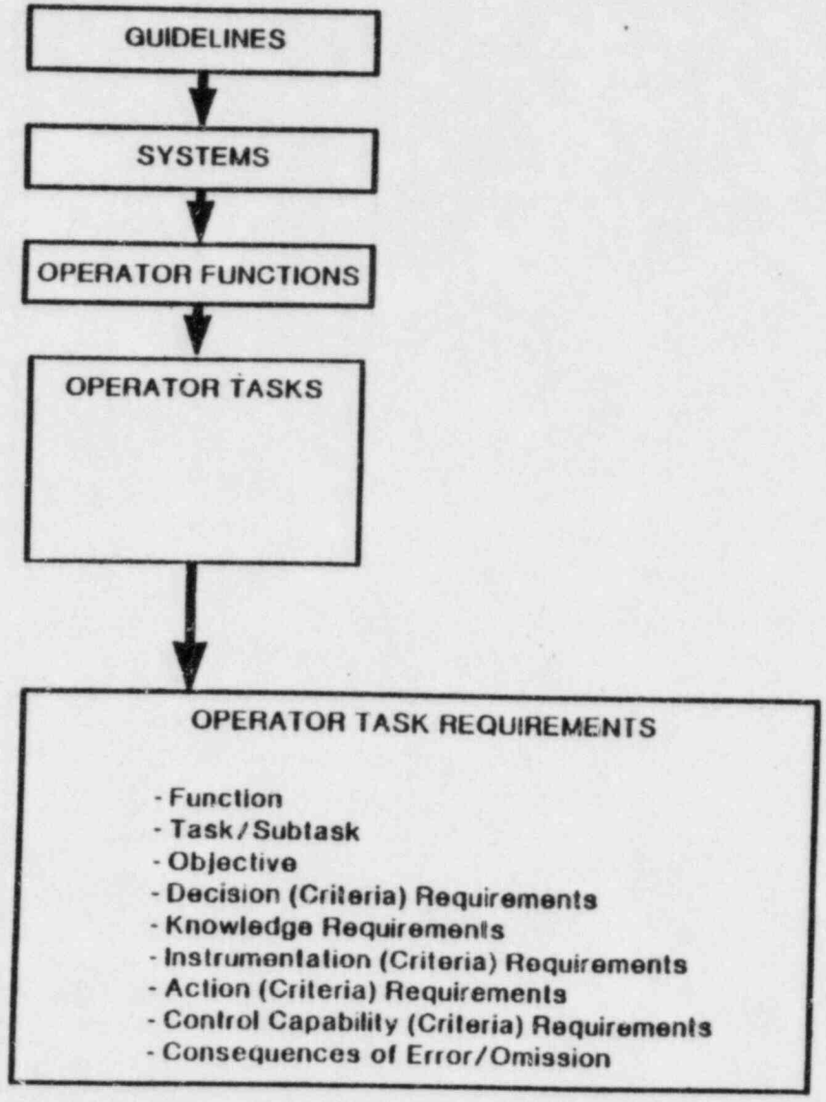

FIGURE 1 TASK ANALYSIS DEVELOPMENT APPROACH

SYSTEM REVIEW AND TASK ANALYSIS DEVELOPMENT APPROACH

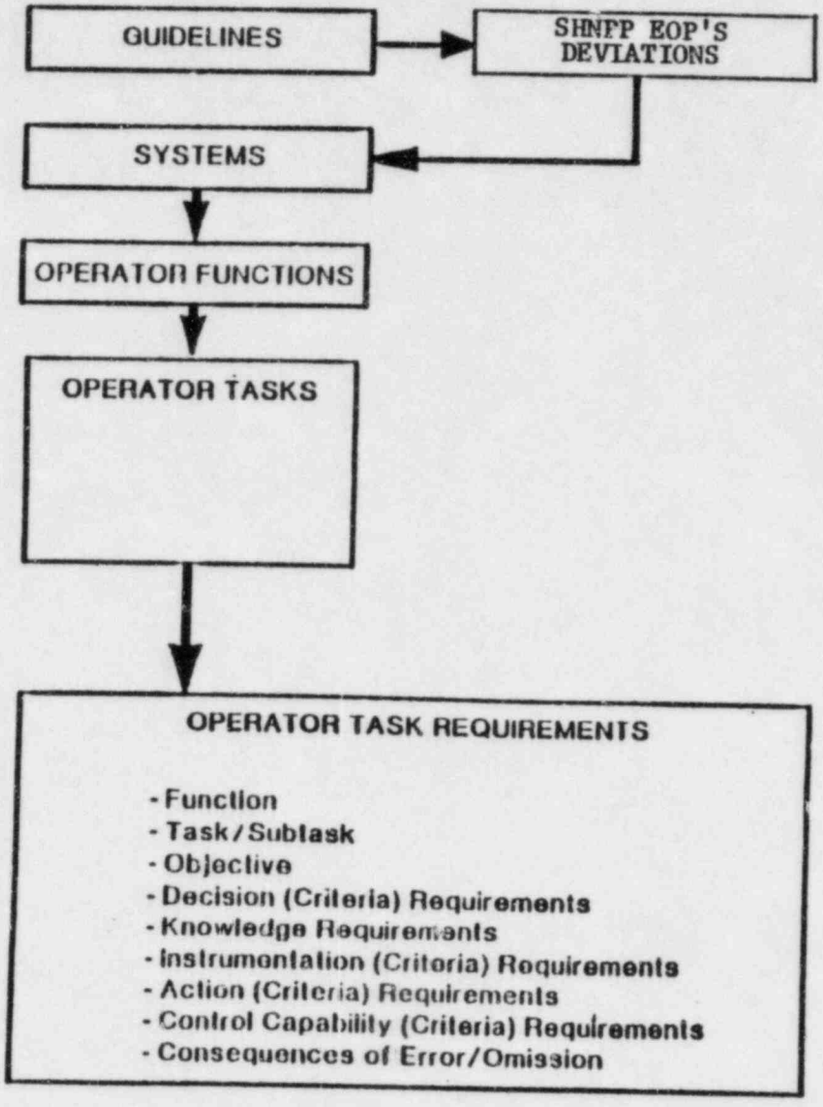

FIGURE 2 TASK ANALYSIS DEVELOPMENT APPROACH