October 3, 1983

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' MOTION FOR SUMMARY DISPOSITION OF JOINT INTERVENORS' CONTENTION II AND WELLS EDDLEMAN'S CONTENTION 37B (HEALTH EFFECTS)

SHAW, PITTMAN, POTTS & TROWBRIDGE
Thomas A. Baxter, P.C.
Dean D. Aulick, P.C.
John H. O'Neill, Jr.

CAROLINA POWER & LIGHT COMPANY
Richard E. Jones
Samantha Francis Flynn

Counsel for Applicants

TABLE OF CONTENTS

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' MOTION FOR SUMMARY DISPOSITION OF JOINT INTERVENORS' CONTENTION II AND WELLS EDDLEMAN'S CONTENTION 37B (HEALTH EFFECTS)

Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency ("Applicants") hereby move the Atomic Safety and Licensing Board, pursuant to 10 C.F.R. §2.749, for summary disposition in Applicants' favor of Joint Intervenors' Contention II and Wells Eddleman's Contention 37B. For the reasons set forth herein, Applicants respectfully submit that there is no genuine issue as to any fact material to these Contentions, and that Applicants are entitled to a decision in their favor on these Contentions as a matter of law.

This motion is supported by:

1. "Applicants' Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard On Joint Intervenors' Contention II And Wells Eddleman's Contention 37";

2. "Applicants' Memorandum of Law In Support Of Motions For Summary Disposition on Intervenor Eddleman's Contentions 64(b), 75, 80 and 83/84," as filed September 1, 1983 and as fully applicable to the present Motion;

3. "Affidavit of Dr. Jacob I. Fabrikant" and Exhibits A - C attached thereto;

4. "Affidavit of Dr. G. Hoyt Whipple" and Exhibit A attached thereto;

5. "Affidavit of John J. Mauro in Support of Applicants' Motion for Summary Disposition of Joint Intervenors' Contention II and Contention 37B" and Exhibit A and B attached thereto;

6. Other documents as referenced.

INTRODUCTION

Joint Intervenors' Contention II and Wells Eddleman's Contention 37B generally assert that the long-term somatic and genetic health effects of radiation released from the Shearon Harris Nuclear Power Plant ("SHNPP") during normal operations, even where such operations are within existing guidelines, have been seriously underestimated for a number of stated reasons. The Contentions thereby place in issue the consideration of the health effects from such releases in the NEPA cost-benefit analysis for SHNPP. Memorandum and Order, dated September 22,

1982 at 11-12. The wording of the contentions as accepted by the Board is as follows:

Joint Contention II

The long-term somatic and genetic health effects of radiation releases from the facility during normal operations, even where such releases are within existing guidelines, have been seriously underestimated for the following reasons:

(a) The work of Mancuso, Stewart, Kneale, Gofman and Morgan establish that the BEIR-III Report (1980 report of the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation, entitled "The Effects on Populations of Exposure to Low-Levels of Ionizing Radiation") (1) incorrectly understood the latency periods for cancer; (2) considered only expressed dominant genetic defects rather than recessive genetic defects; and (3) failed to use a supralinear response rather than a threshold or linear-or-less model to determine low-level radiation effects.

(b) Insufficient consideration has been given to the greater radiation effects resulting from internal emitters due to incorrect modeling of internal absorption of radionuclides, and underestimation of the health and genetic effects of alpha, beta and neutron radiation on DNA, cell membranes and enzyme activity. (Reference: sources cited in Eddleman 37(F).)

(c) The work of Gofman and Caldicott shows that the NRC has erroneously estimated the health effects of low-level radiation by examining effects over an arbitrarily short period of time compared to the length of time the radionuclides actually will be causing health and genetic damage.

(d) Substantial increases in cancer mortality rates have been observed in the vicinity of nuclear facilities. Sternglass, "Cancer Mortality Changes Around Nuclear Facilities in Connecticut," February 1978.

(e) The radionuclide concentration models used by Applicants and the NRC are inadequate because they underestimate or exclude the following means of concentrating radionuclides in the environment: rainout of radionuclides or hot spots; radionuclides absorbed in or attached to fly ash from coal plants which are in the air around the SHNPP site; and incomplete mixing and dispersion of radionuclides.

(f) In computing radionuclide concentrations in the environment, less reactive rather than more reactive forms of radionuclides are used in the computation, and certain radionuclides are ignored. (Reference: sources cited in Eddleman 37(10)).

Eddleman 37B

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

Applicants served two sets of Interrogatories each on Joint Intervenors and Mr. Eddleman regarding their respective Contentions. Joint Intervenors filed Answers dated May 16, 1983 and August 31, 1983 (the latter was provided only following Order of the Board) and Mr. Eddleman filed Answers dated

April 22, 1983 (supplemented August 31, 1983) and August 19, 1983. Mr. Eddleman submitted two sets of Interrogatories to Applicants concerning Contention 37B, and Applicants' responses were served on June 17, 1983 (supplemented August 24, 1983 and September 23, 1983) and August 19, 1983. Joint Intervenors conducted no discovery of Applicants on Contention II. By Order of the Board dated March 10, 1983, as amended by Order dated August 24, 1983 and by oral extension of September 23, 1983, this motion for summary judgment on Joint Contention II and Contention 37B is due by October 3, 1983.

In the Draft Environmental Statement ("DES"), the NRC Staff concludes that the radiological impacts in terms of genetic and somatic health effects from routine operations of SHNPP will be very small. (DES, Section 5.9.3) For somatic effects the Staff's principal estimate is that from releases in one year of plant operation, .008 cancer deaths may occur in the general population (the risk of premature death to the maximum exposed individual in the general population is one in a million). For genetic effects, the DES estimate is that for a year's operation, 0.1 potential genetic disorders may occur in all future generations of the exposed population. These estimates in the DES are based upon information compiled by the National Academy of Science's Advisory Committee on the Biological Effects of Ionizing Radiation in 1972 (BEIR I) and 1980 (BEIR III). The specific DES conclusions are derived by

applying the pertinent health effects information in BEIR I and BEIR III to potential doses to human beings from routine releases at SHNPP. (Id.) The doses in turn are calculated by using the modeling techniques in Regulatory Guides 1.109 and 1.111-13. (Whipple Affidavit at ¶ 6)1/

Intervenors' allegation that the DES seriously underestimates health effects is based primarily upon direct challenges to the judgments found in or underlying the BEIR Reports. Contention II also claims that the effects are underestimated because the modeling techniques utilized for determining dose are inadequate in specified ways with a resulting underestimate of health effects. There is no merit in any of Intervenors' contentions.

1/ The Contentions at issue concern health effects from releases at SHNPP. Health effects from occupational exposure to workers, accordingly, are outside their scope. This point, in truth, is a technical one since the analysis in this Motion covers as well the DES risk estimates from occupational exposure. For genetic risks, the genetic effects from occupational exposure already are included in the DES genetic effects estimate of 0.1 potential effects, and are expressly included, therefore, in the genetic effects estimate being addressed in this Motion. Indeed, occupational dose (326 person/rem) accounts for more than 80% of the total dose underlying the DES genetic effects estimate (SHNPP releases account only for 56 person/rem). (DES, Section 5.9.3.2.) For somatic (cancer) effects estimates, the analysis of effects from occupational exposure is the same as for effects from SHNPP releases. In brief, the DES cancer effects estimate from occupational exposure is small (.04 cancer deaths/per year of operations), the estimate is based on the BEIR Reports and no serious underestimation results.

The modeling techniques in the applicable Regulatory Guides are standard, well established procedures. Joint Intervenors' challenges thereto--inadequate consideration in modeling of internal emitters, of rain-out and dispersion, of fly ash effects and of types of radionuclides included in the models--are without basis. Either the point challenged, in fact, was included in the modeling or its inclusion would not affect or even would reduce the resulting dose calculation. In a related contention, Joint Intervenors claim without justification that the DES considers health effects for too short a time period. Demonstrably, none of these matters has led to a serious underestimate in the DES of the health effects from routine/SHNPP releases. (See Part IV below)

As for the BEIR Reports, these Reports constitute the most scientifically reliable estimates presently available for the potential radiation risks of somatic and genetic health effects in populations exposed to the low levels of ionizing radiation emanated from a nuclear power plant in routine operation. (Fabrikant Affidavit at Q.8-10) Indeed, the NRC has found that "BEIR estimates can be relied upon in the absence of a contest and may be used, along with any other evidence, in ruling on Summary Disposition Motions and rendering initial decisions." Public Service Co. of Okla. (Black Fox Station, Units 1 and 2), CLI-80-31, 12 NRC 264, 277 ("Black Fox") Joint Intervenors and Mr. Eddleman "contest" the BEIR and DES estimates; however,

they do so on bases that are demonstrably incorrect and in reliance on reports that have been repeatedly and conclusively refuted. Illustratively, Joint Intervenors even rely upon the views of Dr. Ernest Sternglass, whose views have been uniformally rejected as unscientific both by the scientific community and by the NRC.

The discussion below and the statements of the experts who have provided affidavits in support of Applicants' motion demonstrate conclusively that Intervenors have not made a meaningful "contest" of the health effects issues. The "experts" cited by Intervenors have been dismissed time and again by the reputable scientific community. On the other hand, Applicants have produced the testimony of respected authorities to show that Applicants and the Staff have appropriately estimated health effects from routine releases at SHNPP, through the use of the BEIR reports and appropriate modeling techniques. Accordingly, Applicants are entitled to judgment as a matter of law on Contention II and 37B. (See Part II below) Applicants further believe that if the position taken in the reports cited by Joint Intervenors and Eddleman respecting health effects are accepted as correct, the health effects estimates in the DES do not change significantly. On this basis, also, Applicants are entitled to judgment as a matter of law insofar as Contentions II and 37B relate to health effects estimates. (See Part III below)

ARGUMENT

As indicated, Contentions II and 37B basically can be divided into challenges to the BEIR Reports and challenges to dose modeling techniques. We will consider these in turn. We note that Contention 37B does not expand upon Contention II except that Contention 37B additionally alleges the BEIR Reports and the DES are deficient in not considering a long list of diseases and, according to Joint Intervenors, in not considering pain and suffering. (Joint Intervenors' Answer to Interrogatories--J.I. Ans. to Int. II-1, 67)

I. Applicable Law

The well-defined standards generally applicable to motions for summary disposition are discussed in detail in "Applicants' Memorandum of Law in Support of Motions for Summary Disposition on Intervenor Wells Eddleman's Contentions 64(f), 75, 80 and 83/84" filed in this proceeding on September 1, 1983. Applicants rely on the discussion of law set forth therein and on the following discussion of the applicability of those general standards to contentions on health effects from routine releases.

The limitations set forth in 10 C.F.R. Part 50 Appendix I may not be contested directly in a facility licensing procedure. Black Fox, supra, at 270 n.7; Potomac Electric Power Company (Douglas Point Nuclear Generating Station, Units 1 and

2), ALAB-218, 8 A.E.C. 79, 89 (1974). Nevertheless, an intervenor may contest issues relating to health effects claimed to result from routine releases that comply with Appendix I limitations. Black Fox, supra, at 276. The adjudicability of those health effects issues stems from and is limited by the Staff's obligation under the National Environmental Policy Act ("NEPA") to prepare an assessment of the relative costs and benefits of a proposed agency action. 42 U.S.C. § 4332; Calvert Cliffs Coordinating Committee v. A.E.C., 449 F.2d 1109, 1113 (D.C. Cir. 1971).

While health effects may be contested, unnecessary adjudication of that issue is to be avoided. Black Fox, supra, at 277. To expedite consideration of health effects contentions, the Board may take official notice of the fact that releases within Appendix I levels result in radiation exposures that are small fractions of doses from natural background radiation. Id. Furthermore, the Board can rely on BEIR estimates as a "generally accepted evaluation of the effects of ionizing radiation," and, as indicated, in the absence of a contest the BEIR estimates can be relied on conclusively.

Therefore, litigation on health effects issues does not begin on a clean slate. Id. To survive a motion for summary disposition, Intervenors must present credible evidence contesting the validity of the Staff's assessment of health effects. This assessment, in turn, is subject to a rule of

reason under the standards applicable to NEPA analyses. Scientists' Institute for Public Information, Inc. v. A.E.C., 481 F.2d 1079, 1092 (D.C. Cir. 1973). For instance, "NEPA does not require the Commission to forecast the...effects of...reactors in the year 2000 in the same detail or with the same degree of accuracy as another agency might have to forecast the increased traffic congestion likely to be caused by a proposed highway." Id. The Staff need not foresee the unforeseeable. Id. Further, a genuine issue of fact cannot be raised by asserting a theoretical possibility of harm. Dairyland Power Cooperative (La Crosse Boiling Water Reactor), LBP-82-58, 16 N.R.C. 512, 526 (1982)(citing Northern States Power Co. (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 N.R.C. 41, 48 (1978)). The discussion below demonstrates that under these standards there is no genuine issue of material fact with respect to Joint Contention II and Eddleman Contention 37B.

II. Challenges To BEIR Reports As Used in the SHNPP DES.

For routine releases from a nuclear power plant such as SHNPP, the pertinent health effects issue is the potential effect from low doses of low-LET radiation (LET is a measure of energy). Any doses received from routine SHNPP releases necessarily will be low level given the extremely limited amounts of radioactivity released, the regulatory limits on dose and the

protective features at SHNPP. Black Fox, supra at 277. Further, the pertinent dose will be low-LET because substantially all the releases from SHNPP will be low-LET emissions of gamma and beta radiation. While minute quantities of high-LET radiation (no more than one/billionth of the total) will be released, this amount is irrelevant to health effects estimates. (Whipple Affidavit at ¶ 13-16; Fabrikant Affidavit at Q.15, 60). In these circumstances, the portions of the BEIR Reports pertinent to the Shearon Harris DES are those portions addressing low-dose, low-LET radiation; and it is on these portions that we will focus. The Intervenors challenge BEIR and the DES in this respect both by repeated reference generally to allegedly authoritative authors and their works and by identification of specific issues as set forth in the Contentions. Following a brief review of the BEIR Reports as here relevant, we will address these general and specific contentions of Intervenors.

A. The BEIR Reports as Pertinent to SHNPP DES.

The BEIR Committees, which prepared BEIR I and BEIR III, were composed of the nation's leading medical doctors, scientists, epidemiologists, geneticists and other specialists in radiological health effects. (Fabrikant Affidavit at Q.7). Our review of BEIR I and III (and also our responses to challenges to these reports by Intervenors) is based primarily on

the attached affidavit of Dr. Jacob Fabrikant. Dr. Fabrikant is a preeminent scholar, holding both a degree in medicine and a Ph.D in biophysics. He specializes in the radiological sciences and has written extensively in the field. He has served as Director of Public Health and Safety on the President's Commission on the Accident at TMI, as well as on the BEIR I, II and III Committees. For the BEIR III Committee, Dr. Fabrikant was Chairman of the Ad Hoc Committee to establish radiation cancer risks on low-dose, low-LET whole body radiation. (Fabrikant Affidavit at Q.1, 3-6, Exhibits B-C) There hardly could be a person more competent and qualified to testify concerning the BEIR approach to health effects as they are utilized in the NRC Staff's DES.

For low-dose, low-LET radiation as may result from routine operations at Shearon Harris, the effects of potential concern as set forth in the BEIR Reports are limited to various cancers (somatic effects) and to genetic effects. There are other health effects from radiation exposure--for instance, cataracts and heart disease; however, these have been observed to occur only at threshold doses well above levels permitted by NRC regulation from routine nuclear power plant operation. (Fabrikant Affidavit at Q.15)

Genetic effects from radiation, interestingly enough, have never been observed in humans even after high level exposure (e.g. from the Hiroshima and Nagasaki atomic bombings).

However, such effects have been observed in laboratory animals, primarily in laboratory mouse experiments. Conservatively, BEIR projects from these animal data a genetic effect in human beings. Based on these data, the effect of low level radiation in producing genetic change is proportional to dose, that is, the effect is linear. (Fabrikant Affidavit at Q.16-17, 19) By this measure, as applied to the SHNPP operation, the genetic effects are insignificant as set forth in the DES. The portion of the BEIR reports discussing genetic effects, as used in the DES, has never been criticized in the scientific literature subject to peer review. (Fabrikant Affidavit at Q.20)

Cancer effects have not been observed in human beings at low levels of radiation. However, cancer effects have been observed at high levels of radiation. Epidemiological studies of these high level effects, together with theoretical considerations and laboratory animal and other studies, serve as the basis for BEIR estimates of cancer effects from low-level, low-LET radiation. Such effects can be charted on a dose-response curve that, conceivably, could range in shape (in ascending degree of impact on human beings) from pure quadratic to linear quadratic, linear and supralinear. Supralinearity means that the health effects per unit dose from low-level radiation are more severe than from high-level radiation. (Fabrikant Affidavit at Q.16, 17, 22-23) BEIR III selected the linear quadratic model as its preferred model to chart the

dose-response effect between low-level radiation and cancer. Twenty of the 22 Committee members accepted this preferred approach. Of the two who disagreed, one favored a much lower dose-response relationship and one favored a linear relationship. BEIR I selected a linear relationship. (Fabrikant Affidavit at Q.24-26) In the DES, the NRC Staff has utilized the linear relationship of BEIR I and in this respect is more conservative (that is, tends to overestimate effect) than the preferred BEIR III model. The BEIR Committee unanimously rejected the supralinear model as having no theoretical, radiobiological or epidemiological support. (Id.) Utilizing the conservative linear model from BEIR I, the NRC staff derives the very low estimate of potential cancer effects from operation of SHNPP as set forth in the DES.

The BEIR approaches, assessments and evaluations of potential health effects in human populations exposed to low level radiations, as relied upon in the DES, are confirmed by and consistent with those made by all leading national and international committees concerned with radiation protection, standards and health. These committees include the International Commission on Radiological Protection ("ICRP"), the National Council on Radiation Protection and Units ("NCRP"), and the United Nations Scientific Committee on the Effects of Atomic Radiation ("UNSCEAR"). (Fabrikant Affidavit at Q.11) Use of the BEIR Reports by the NRC Staff in the DES estimates

of potential health effects from routine SHNPP operation is proper and leads to appropriate and conservative estimates. (Fabrikant Affidavit at Q.12-14) Indeed, it is quite possible that no health effects will occur from routine SHNPP releases. (Fabrikant Affidavit at Q.18)

B. General Challenges to the BEIR Reports

The above observations and conclusions in the BEIR reports, as indicated, were made by preeminently qualified committees of recognized experts and are supported by all leading national and international organizations considering radiological health effects. In the circumstances, absent substantial, well established challenge to the BEIR reports, there can be no issue of material fact respecting their use. Black Fox, supra at 277. Intervenors attempt such a challenge, they fall far short and demonstrably fail to identify any issues of material fact. One attempt by Intervenors in this respect (see e.g., Contention 37B) is to reference generally the supposedly authoritative works of several individuals, namely, Mancuso, Stewart and Kneale, Bross, Bertell, Gofman and Morgan. The claims of the referenced individuals, however, are not new; they have been repeatedly critiqued and rejected; and they do not serve as a basis for questioning the BEIR analyses. (Fabrikant Affidavit at Q.27-28)

1. Mancuso/Stewart/Kneale.

Mancuso/Stewart/Kneale studied the cancer mortality rate for workers at the Hanford Nuclear facility between 1943 and 1971. Their preliminary 1977 report indicated a dose-response relationship greater than linear. Leading epidemiologists and statisticians have criticized their analysis in all respects, and even the authors themselves have substantially moderated their position. (Fabrikant Affidavit at Q.29-30) Methodologically, the Mancuso/Stewart/Kneale work is fundamentally flawed by, among other things, inadequacy of radiation dosimetry, failure to treat confounding factors which could have caused cancer in workers in the absence of radiation exposure, selection bias, inability to replicate their results and inconsistencies with the spontaneous incidence of cancer in the exposed population. In this last respect, if Mancuso/Stewart/Kneale estimates were correct for radiation-induced cancer, background levels of radiation naturally present in the environment would produce more than the actual number of cancers observed in the entire population of the United States. (Fabrikant Affidavit at Q.30) In short, the work of Mancuso/Stewart/Kneale is totally unreliable as a basis for challenging the BEIR estimates of health effects.

2. Bross.

Bross claims that the risk of cancer following diagnostic X-ray exposure (a low-level radiation exposure) is greater than at high doses, and he claims as well that he has identified previously unrecognized subgroups as being peculiarly sensitive to radiation damage. Regarding subgroups, Bross concludes that children with leukemia indicators are more sensitive to radiation; however, reanalysis of his data has showns that such individuals are sensitive to the diseases identified by Bross independent of any radiation exposure. This non-radiation related sensitivity is well known in pediatric medicine and clinical hematology. (Fabrikant Affidavit at Q.31-32)

As for Bross' conclusions concerning health effects from diagnostic X-rays, his approach requires the nonsensical assumption that the incidence of leukemia and heart disease without X-rays would be zero, and his unconventional methodological approach remains totally unjustified. Bross' articles and related writings--including those by Bertell based on the same data--have been severely criticized and rejected in the scientific literature as unreliable. (Fabrikant Affidavit at Q.32) Bross and others also have analyzed the incidence of leukemia among workers at the Portsmouth Naval Shipyard. Again, the approach used suffers from severe methodological flaws (e.g., no detailed denominators are used and no allowance is made for smoking effect in lung cancer cases) and the conclusion drawn

(significantly heightened low dose radiation effect) could not be replicated. (Fabrikant Affidavit at Q.33-36) Bross' position, accordingly, cannot be deemed a basis for questioning the BEIR Reports. As concluded by the Appeal Board in Waterford, "Dr. Bross' theories regarding the health risks of radiation exposure have been widely criticized and rejected by respected members of the medical and radiological health community." Louisiana Power & Light Co. (Waterford Steam Electric Station, Unit 3), ALAB-732 (June 29, 1983) slip op. at 14 n.15 ("Waterford").

3. Bertell.

Bertell claims the same elevated effect from low-dose radiation as Stewart/Mancuso/Kneale and Bross. Relying on Bross, she also claims that a host of additional diseases are caused by low-level radiation and that these have been missed by the scientific community. Bertell, however, has done no original analysis of her own, and she has made no attempt to answer the critics of the Mancuso/Steward/Kneale and Bross reports. Her work additionally has been severely criticized and rejected by eminent epidemiologists and health physicists for "erroneous claims, selection of data, bias, misinterpretation of the Hanford cancer data and Tri-State leukemia data, misstatements and distortions of fact, lack of support by references to the scientific literature and drawing of speculative conclusions

based on no experimental or clinical data." (See Fabrikant Affidavit at Q.37) Her contentions, conclude the reviewers, are "unsupported by references to the literature and the stated effects, of course, should be regarded as pure speculation unless the author can cite experimental data." (Id.) Finally, Bertell has no training or qualification in the area she purports to analyze. Bertell's views obviously are unreliable and cannot serve to discredit BEIR I and III. (Id.)

4. Gofman.

Between 1969 and 1971, Gofman, with others, wrote several of articles--none in the peer-reviewed literature--arguing that cancer effects from radiation were substantially greater than generally accepted. The BEIR I (1972) Committee reviewed the Gofman, et al, reports, data, methodology and basis for estimates, and the BEIR Committee seriously criticized Gofman's use of erroneous generalizations and assumptions and BEIR I rejected his conclusions. As Dr. Fabrikant states, in summarizing Gofman's errors, "the BEIR I Committee (1972) carefully analyzed all Gofman's approaches and step-by-step proved they were wrong." (Fabrikant Affidavit at Q.38)

In 1979, Gofman analyzed the Stewart/Mancuso/Kneale data, but added nothing new to the original reports, did not answer the criticisms of those studies and drew essentially the same conclusions. Hence, rejection of Stewart/Mancuso/Kneale

analysis, as discussed above, constitutes rejection of the analysis by Gofman. (Id.)

In 1981, Gofman published a book, but length does not add to quality. The book suffers fundamentally from serious methodological flaws, unconfirmed statistical techniques and selection biases. Indeed, Gofman's book continues the manifest errors from his earlier papers, and thus is as unreliable in assessing potential health effects from low-level radiation as the earlier reports. (Id.) Again Gofman cannot serve as a reliable basis for challenging the BEIR reports.

5. Morgan.

Morgan also contends in his principal article (1975) that low doses may be more hazardous than comparable high doses. However, he does not distinguish and never has distinguished, between the effects of low- and high-LET radiation. Indeed, in his study, he emphasized the effects of high-LET radiation. His analysis, thus, produces no information on the low dose range of low-LET exposure, the topic of relevance in reviewing the health effects from routine releases at a nuclear power plant. Later articles by Morgan principally interpret other's works and add no original information. (Fabrikant Affidavit at Q.39)

Neither the claims made nor the data used by the above authors are new. Most of their reports predate the major BEIR,

UNSCEAR, ICRP and NCRP scientific reports and are quoted and reviewed therein. (UNSCEAR 1977, 1982, BEIR 1980, NCRP 1980). Some scientific papers have been published or presented at meetings in 1982 and 1983. However, these do not provide new information and basically are the authors' personal interpretation of old data which have been available for years or decades. None of the works of the referenced authors, whether new or old, undercuts the conclusion that the linear dose response curve--as used in BEIR I and DES--is conservative and wholly appropriate as a basis for determining health effects from routine operations at SHNPP and the conclusion that the NRC staff was completely proper in basing its health effects analysis on the BEIR reports. These reports reflect and continue to reflect the scientific consensus. (Fabrikant Affidavit at Q.40)

C. Specific Challenges to the DES and BEIR Reports.

Besides general reference to the authors discussed above, Joint Intervenors and Eddleman raise specific challenges to the BEIR Reports as these reports are pertinent to the DES health effects assessment for SHNPP. Their contentions cover latency period, recessive genetic diseases, supralinearity, cell effects, observed health effects in the vicinity of nuclear power plants, and incidence of disease in addition to cancer and genetic effects. As with the general contentions, these

specific contentions are without merit and do not raise a material issue of fact in this proceeding.

1. Latency Period.

Joint Intervenors in Contention II(a)(i) contend that health effects are seriously underestimated in the DES because the BEIR Committee incorrectly understood cancer latency periods. The misunderstanding is all Intervenors'. Joint Intervenors, for example, make the incredible statement that they "are aware that a number of authorities are questioning the use of a 'latency period' for cancers induced by radiation...." (J.I. Ans. to Int. II-3, 5) When challenged in the Interrogatories to substantiate this claim, Joint Intervenors could not. (J.I. Ans. to Int. II-55; Fabrikant Affidavit at Q.41-42) Latency period is the period between the time of the cause of the cancer and its appearance in a form that can be diagnosed medically. Latency period is common to all diseases, (chicken pox, flu, etc.) and exists for all cancers. Authorities are not questioning its use for cancers induced by radiation and it is absurd so to suggest. (Id.)

In any event, BEIR III correctly understood and utilized latency period. Several important parameters influence calculation of cancer risks, including the minimal latency period; and these parameters are utilized in BEIR III. Minimal latency period is the interval between cause of a disease and the time

a statistically significant excess of the disease appears. A minimal latency period for cancer, from radiation exposure or other cause, is an observed fact. Whether or not a definition is given to the phenomenon, the time between dose and observed effect must be taken into account in projecting radiation health effects, including the development of dose-response curves, or the projections would be demonstrably spurious. (Fabrikant Affidavit at Q.43) As illustrative calculatons by BEIR III, the minimal latency period for solid cancers is generally ten years or more, with certain cancers (e.g., leukemia) having latency periods of two to four years. A maximum latency period (time after which there is no effect) has been observed for leukemia and the bone cancers and therefore may be implied for other diseases. Conservatively, BEIR III has employed a maximum latency period only for the two diseases for which it has been specifically observed. For all other diseases, BEIR III projects continued potential lifetime effects. (Id.)

In "explaining" their opposition to BEIR III's use of latency period Joint Intervenors state BEIR III relies on studies with insufficient follow-up to identify longterm disease level. (J.I. Ans. to Int. II-4) However, the most current and complete data were made available to the BEIR Committee, including prepublication articles. Further, as indicated above, BEIR III conservatively assumes a continuing effect for all diseases as to which a maximum latency period

has not been specifically observed. (Fabrikant Affidavit at Q.44) Joint Intervenors also reference note j. of Table V-14 in BEIR III (which note concerns only female breast cancers) and criticize the BEIR III report in its treatment of latency period for breast cancers. For this criticism , Joint Intervenors cite "Rossi, in criticizing the report, (at pages 278-279 thereof)...." (Joint Intervenors' Answer to Interrogatory II-4) Joint Intervenors are zero for two. The cited pages are a part of the BEIR Report, not a dissent; and, the pages, therefore, include the very page Joint Intervenor contend should have been included. Further, Rossi in his dissent does not mention latency period or breast cancer risk estimates; in addition his basic criticism of BEIR III is that the preferred dose response for low-LET, low level radiation curve in BEIR III is too high and overestimates health effects, the exact opposite of Joint Intervenors's position. (Id.)

2. Recessive Genetic Defects.

In Contention II(a)(2) Intervenors contend BEIR III seriously underestimates health effects by failing to consider recessive genetic defects. Genetic defects, from whatever source are grouped into four well recognized categories--single gene dominant disorders, chromosomal derangements, recessive diseases and irregularly inherited diseases. Recessive diseases are the result of both parents contributing the same

defective gene to the offspring. Recessive diseases contribute about one percent of the genetic disease base. (Fabrikant Affidavit at Q.45) Notwithstanding the clear definition of recessive diseases, Joint Intervenors' Answers to Interrogatories reveal genetic concerns broader than such diseases. Joint Intervenors for instance "define" recessive genetic defects as anything not being dominant, including thereby chromosomal derangements and irregularly inherited diseases as well as the recognized category of recessive diseases. They also cite alleged deficiencies with respect to mutational component selection and mild mutations. (J.I. Ans. to Int. II-8, 13) None of these points raise material issues of fact regarding the BEIR reports or DES conclusions.

As to Joint Intervenors' principal contention that BEIR III fails to account for genetic health effects other than dominant gene disorders, Intervenors simply are wrong. BEIR III in Chapter IV exhaustively reviews genetic effects, including all four categories. As reflected in the summary on Table IV-2, (page 85), the genetic effects from radiation are insignificant compared to naturally occurring effects. (Fabrikant Affidavit at Q.43) Joint Intervenors in Contention II cite Mancuso, Gofman, Stewart, Kneale and Morgan in support of their proposition. Of these, only Gofman, in his book (outside the peer-reviewed literature), has extensively discussed the genetic analysis in BEIR III. Gofman is not an

expert in genetics and is not recognized as such in the scientific community. His views contradict scientific evidence and are unsupported by reference to the genetic literature. Gofman's uninformed comments in no way denegrate the scientific consensus on genetic effects from radiation as set forth in the BEIR Reports. (Fabrikant Affidavit at Q.46-47)

Joint Intervenors proceed to contend, apparently in reliance on Gofman, that the BEIR III mutuational component of 5 to 50% for irregularly inherited disorders was arbitrarily chosen by BEIR (a contention unrelated to recessive diseases). However, the report makes clear that, in a thoroughly professional manner, a range was selected encompassing recognized uncertainties. This decision was based on the most current knowledge and information available in medical genetics. Gofman, in disagreeing, offers no medical or scientific support whatsoever for his position. To the contrary, Gofman's position reveals his lack of understanding of genetics. For instance, he proposes a mutational component of 100%, which cannot occur under the governing scientific principles. (Fabrikant Affidavit at Q.47-50)

Joint Intervenors further contend that mild mutations must be calculated in genetic risk estimates for humans. The BEIR Committees recognized the theoretical possibility of such effects--although no genetic effects of any sort have been observed in human beings, mild mutations have not been observed

even in laboratory mice, the most appropriate laboratory experimental mammals for genetic research; rather, such mutations have been observed only in the fruit fly. BEIR observed that this fruit fly effect warranted further attention, but BEIR did not calculate an effect on man because for numerous reasons the available data did not justify the calculation. Thus, the mutations have been, as indicated, identified only in the fruit fly; they can only be determined statistically; and there is evidence that the effect is infrequent and would be eliminated from the population via genetic mechanisms. For the BEIR Committee to have included a risk assessment for mild mutations in man, in these circumstances, clearly would have been unscientific and wholly inappropriate. (Fabrikant Affidavit at Q.51, 52) As referenced by Joint Intervenors, Bertell discussed mild mutations, but her work is totally discredited and without merit. (Fabrikant Affidavit at Q.53)

3. Supralinearity.

In Contention II(a)(3) Joint Intervenors contend BEIR III erred in not using supralinearity as a dose-response relationship for health effects from SHNPP releases. BEIR III, indeed, did not adopt a supralinear approach; however, this was not in error. Supralinearity for low dose, low-LET radiation was unamimously rejected by all 22 members of the BEIR Committee. It has been rejected as well by ICRP, NCRP, and UNSCEAR. No

recognized scientific body has adopted supralinearity and this is simply because scientific evidence does not warrant it. In fact, the general scientific consensus is that a linear assumption (as in BEIR I and DES) is conservative and overestimates health effects. (Part III.B., supra; Fabrikant Affidavit at Q.54-55)

Joint Intervenors say the BEIR conclusion is wrong and cite the works of Mancuso/Stewart/Kneale and others. The principal proponents of supralineraity consisting of Mancuso, Stewart, Kneale, Gofman, Bross, Bertell and Morgan have been discussed and disposed of above. It remains to address four other authors cited by Joint Intervenors as supporting supralinearity--namely, Rossi and Radford in their dissents from BEIR III, plus Potten and the ICRP in Publication 18. (Joint Intervenors' Answer to Interrogatory II-18) Joint Intervenors' citations are wholly inappropriate--none of these four supports supralinearity. Rossi believes BEIR III's preferred linear quadratic model (less than linear) overestimates effect. Radford prefers linearity (for leukemia and bone marrow cancer he prefers linear quadratic). The ICRP report referenced by Joint Intervenors deals solely with high-LET radiation. ICRP risk estimates from low-LET, low-level radiation are found in ICRP Report No. 26 (1977), and these estimates are quite consistent with the BEIR Reports. Potten, finally, does not address the point. (Fabrikant Affidavit at Q.57)

An additional point regarding supralinearity should be noted. Not only is supralinearity inconsistent with existing experimental and epidemilogical data, but there is no theoretical basis for predicting greater health effects per unit dose from low doses of low-LET radiation over higher doses. Intervenors suggest no such theoretical basis. In contrast, a lesser effect at lower doses (that is, a dose response relationship less than linear) can be expected since delivery of a given total dose protracted over time as against in a single acute exposure allows the body cells and tissues to repair and recover from the radiation injury of the successive small dose increments. The quantitative relationship of this phenomenon is called the dose reduction effectiveness factor (DREF). NCRP estimates the DREF reduces the health effects for cumulative exposes of radiation up to 20 rads by a range of 2 to 10 times below that predicted by the linear model. (Fabrikant Affidavit at Q.56)

For its supralinear contention, Joint Intervenors can cite no credited authority, nor can they present any theoretical support. They have failed utterly to establish that the linear dose/response curve conservatively adopted by BEIR I and the DES lead to a serious undersestimate of the risk of health effects in the DES. There is, thus, no issue of material fact on this point.

4. DNA, Cell Membranes and Enzyme Activity.

Joint Intervenors contend in Contention II(b) in part that health effects are seriously underestimated because insufficient consideration is given to effects of internal emitters due to underestimation of somatic and genetic effects of alpha, beta and neutron radiation on DNA, cell membranes and enzyme activity. This contention raises no issue of material fact.

As for DNA, cellular membrane and enzyme activity, generally, treatment in the BEIR reports is wholly appropriate and sufficient to support the DES. As Dr. Fabrikant states:

> All radiation protection standards take into account fundamental scientific and experimental evidence at the cellular level, as well as epidemiological survey data. To the extent such data and reliable evidence can be used to support or change risk estimates, they are so used. However, when such data or evidence is incomplete or contradictory or cannot be reliably extrapolated to health effects on humans, it would be scientifically and medically inappropriate to do so, and it is not done. (Fabrikant Affidavit at Q.58)

This is the approach in the BEIR Reports. Thus, because it is appropriate to do so, DNA and cellular information are utilized as one element of the genetic estimates in the BEIR Reports. On the other hand, after a review of the scientific literature, BEIR III refuted and determined not to adopt Dr. Sternglass' assertion that health effects were underestimated because of postulated effects on cell membranes. (Id.) Where the particular type radiation is pertinent in this respect, the

BEIR Reports take that into consideration also. Most important in this regard is the effect of alpha and neutron radiation, which is high-LET radiation. This effect is well known, well studied and well established in the relevant epidemiological literature, and it is utilized as necessary in the BEIR Reports. (Id.)

Although difficult to determine from Joint Intervenors' Answers to Interrogatories, their principal concern appears to be that the BEIR Reports and the DES fail to account for the high-LET effect of alpha, beta and neutron radiation. (J.I. Ans. to Int. II-20-22) The simple answer to this concern is that neither the DES nor BEIR underestimate the effects of high-LET radiation. In the DES, as it addresses routine operation of SHNPP, effect of high-LET radiation is irrelevant. Beta rays are low-LET raditions; no neutrons are released in routine operations and alpha emitters constitute less than one/billionth of all releases. (Whipple Affidavit at ¶ 13-16) In this latter respect, Joint Intervenors postulate that high-LET radiation has an impact per dose (relative biological effectiveness, RBE) 10 to 20 times greater than low-LET radiation. (J.I. Ans. to Int. II-22) Obviously, applying this factor to one billionth of the SHNPP's emissions cannot alter the DES health effects estimate. (Id.; Fabrikant Affidavit at Q.15, 60) As for BEIR consideration of high-LET radiation, Joint Intervenors' RBE factor is obtained from the BEIR III

reports, so that far from criticizing BEIR III in this respect, Intervenors are relying on BEIR III. (Fabrikant Affidavit at Q.60)

Intervenors raise other points in purported support of Contention II(b); however, these references reflect a virtual total misunderstanding by Joint Intervenors of the BEIR approach, the material cited and even their own contention. (Fabrikant Affidavit at Q.59-61) Basically, the references cited in support of Contention II(b) as here discussed are totally unrelated to the Contention. For instance, Joint Intervenors reference a study by Little. However, the cited study deals with mouse fibroblast cell cultures grown in vitro, the use of x-radiaton to induce cell transformation, and related points. It has nothing to do with effects of alpha, beta, and neutron radiaiton on DNA, cell membranes and enzyme activity, or the relationship of these to internal emitters. As Dr. Fabrikant states, "It is disturbing to find this type of repeated misrepresentation on reference to the scientific literature." (Id. at Q.60) Joint Intervenors other references have no greater force and make no greater sense. (Id. at Q.59-61) In sum, Contention II(b) raises no issue of material fact.

5. Mortality Around a Nuclear Power Plant.

In Contention II(d), Joint Intervenors claim that somatic and genetic health effects from routine operation of SHNPP are seriously underestimated in light of substantial increases in cancer mortality rates that have been observed in the vicinity of nuclear facilities. In the Contention itself, Joint Intervenors cite Dr. Sternglass in support. Joint Intervenors' Contention totally lacks credibility.

In no peer-reviewed literature anywhere in the Western world has anyone contended or even suggested that there have been substantial radiation-related increases in cancer mortality rates around nuclear facilities. (Fabrikant Affidavit at Q.62) This contention has been made by Dr. Sternglass for more than a decade (outside the peer-reviewed literature), including in the reference cited by Intervenors. However, Dr. Sternglass' conclusions and unscientific methodology have been universally discredited in numerous fora, including professional organizations and Commission adjudicatory proceedings. (Fabrikant Affidavit at Q.63-67)

As long ago as 1971, a statement was unanimously adopted by the then president and all then living past presidents of the Health Physics Society disowning Dr. Sternglass' approach and concluding that his arguments are not supported by the data he presents. In BEIR I, Sternglass' contentions of elevated health effects likewise were considered and rejected.

(Fabrikant Affidavit at Q.65) For the many NRC decisions rejecting Sternglass' observations as literally incredible, see "Applicants' Response to "Joint Contentions of Intervenors" Dated July 13, 1982--Contention 11(d) (Health Effects) dated August 10, 1982. In Trustees of Columbia University in the City of New York, ALAB-50, 4 A.G.C. 849 (1972), aff'd sub nom., Morningside Renewal Council, Inc. v. A.E.C., 482 F.2d 234 (2d Cir. 1973), cert. denied, 417 U.S. 951 (1974), the Appeal Board concluded: "Dr. Sternglass' statistical methodology and selective sampling techniques are not scientifically credible and, indeed, raise serious questions as to whether his presentation is consistent with even a moderate degree of scientific responsibility." Id. at 862.

The fundamental problems with Sternglass' "studies" concerning allegedly increased mortality from and around nuclear facilities are: (a) Unscientifically, he predetermines a conclusion and he selects data to support that conclusion, while ignoring data that do not. (b) He utilizes medical record data aggregated crudely by geographical area and this is wholly unsuitable, even if done in good faith, for radiological health effects studies. (Fabrikant Affidavit at Q.63-65) For the latter point, see, in particular, Fabrikant Affidavit at Q.64. The former point is reflected in Sternglass' Millstone "study" referenced by Joint Intervenors, as well as all other such Sternglass reports. In the Millstone study, Sternglass again

ladens the report with polemics pushing a particular point of view, selects only facts supporting that view, is logically inconsistent and fails to consider alternative explanations (including even failure to consider random variations). Further, the Millstone report referenced by Intervenors is based on an early Sternglass report concerning elevated levels of strontium 90 around Millstone plant. This earlier report, in the Sternglass edition, selectively picks data points and is without merit. Sternglass' Millstone studies have been reviewed and rejected by the NRC staff by the Administration of the EPA. (Fabrikant Affidavit at Q.66) In sum, in no sense of the term, can Sternglass be deemed a competent expert on low-level radiation (Fabrikant at Q.6), and in any event, his methodology and conclusions are totally without merit. Sternglass' views therefore cannot establish a genuine issue of material fact regarding the approaches and conclusions in BEIR and the DES on health effects.

In answer to Interrogatory II-32 regarding Contention II(d), Joint Intervenors add that substantial increases in cancer mortality around nuclear facilities have been observed, in addition to Sternglass' reports, by Carl Johnson and the U.S. Public Health Service. We are aware of no such observation or suggestion by the U.S. Public Health Service and none is cited. To the contrary, an important scientific report from USPHS indicate the exact opposite conclusion. (Fabrikant Affidavit at Q.68)

As for Carl Johnson, his reports on plutonium effects in Colorado are doubly irrelevant. First, plutonium emits high-LET radiations, the characteristics of which are irrelevant to consideration of routine operations at SHNPP. Second, Johnson's work--like Sternglass'--totally lacks validity. Incorrect statistical procedures were used and important environmental factors known to impact the outcome of the analysis were ignored. His study was considered and rejected as being without scientific merit by BEIR III and ICRP Committee 1; his study also was reviewed and rejected by the Office of Radiation Programs of the EPA. (Id.) Johnson has demonstrated in other NRC proceedings his lack of competence and expertise. Thus, in Waterford, supra at 18, the Board found Johnson's testimony "of essentially no value."

By Response dated August 10, 1982, Applicants objected to inclusion of Contention II(d) in this proceeding because no credible basis had been provided for the Contention. The Board ruled that the points made were more appropriate for a summary disposition motion. The time is right, and the Board should find that Contention II(d) raises no issues of material fact in this proceeding.

6. Diseases Besides Cancer and Genetic Defects.

In Joint Intervenors' Contention II, the health effects deemed to be of potential concern from radiation effects at Shearon Harris, are limited, correctly, to cancer and genetic defects. (J.I. Ans. to Int. II-1) Mr. Eddleman in Contention 37B, however, is not so restrained. He alleges that a host of additional somatic diseases will occur--from heart trouble to allergies--from routine operation of SHNPP. He cites Bertell for this, who in turn relies on Bross. Mr. Eddleman establishes no issue of material fact in this regard.2/

Cancer and genetic defects potentially arise from injury in one or a few cells. Accordingly, these diseases are treated as having no threshold dose. All other diseases are more complex and require that injury take place in many cells simultaneously and appear as tissue or organ damage. All these

---

2/ In answer to Interrogatory II-67, Joint Intervenors suggest that Contention 37B is broader than Contention II because it also raises the issue of pain and suffering. First, there is no way that Contention 37B as written can be deemed to include pain and suffering as a Contention. The Contention plainly and unambiguously asserts that "the estimates of the number of ... victims" from increased radiation exposures are more accurately estimated by certain referenced authors than in BEIR or by the NRC Staff. There is no indication whatever that the issue has to do with the pain and suffering of such victims. Second, Applicants acknowledge that any disease is accompanied by pain and suffering; however, this is a condition common to all illnesses from whatever cause, and could not conceivably be differentially related to diseases potentially caused from routine nuclear power plant operation. (Fabrikant Affidavit at Q.69) This point could not affect, therefore, the NEPA cost-benefit analysis. See Part IV.A below.

diseases accordingly have a threshold dose. Illustratively, the threshold dose for cataracts is 500 rads and for heart disease it is 4,000 rads. Because it is generally agreed that there is no threshold dose for cancer and genetic defects, these at least in theory might be caused by doses from the very low radiation released from a nuclear power plant in routine operation. On the other hand, for all other diseases, the threshold dose is greater by orders of magnitude than the dose levels that may be received from SHNPP releases in routine operation. Accordingly, only cancer and genetic effects can be considered as potential health effects from normal operation of SHNPP. (Fabrikant Affidavit at Q.69)

Mr. Eddleman's support is Dr. Bertell. As discussed above, Dr. Bertell is unqualified as an expert in any way relating to low level radiation. Beyond this, she relies upon the work of Bross which has been thoroughly discredited. As to her own "contributions", these also as discussed have been thoroughly discredited. (Id.) Contention 37B, therefore, raises no material issue of fact in this proceeding.

As the above review should make clear, the NRC Staff in the DES has proceeded in a thoroughly proper fashion in estimating health effects by relying on the BEIR reports. Joint Intervenors' and Mr. Eddleman's contentions to the contrary are utterly without credible foundation. No issues of material fact in this respect are raised; accordingly, on the

contentions discussed above, Applicants are entitled to judgment in their favor as a matter of law.

III. Assumption That Joint Intervenors' Contentions Regarding Risk Estimates Are Correct.

The above analysis is worthwhile since it is appropriate, periodically, to review the BEIR Reports and criticisms thereof. Such a review serves to underscore the remarkably high quality of the former and the vacuity of the latter. In truth, however, such review is not essential to disposing of the contentions of Joint Intervenors and Mr. Eddleman discussed above. If we assume (and this is a mighty effort) that the authorities Joint Intervenors principally rely upon are correct in their criticism of BEIR, still no issue of material fact arises. This is simply because the error factors that can be derived from these works do not increase the health effects estimates in BEIR and the DES in any way that could effect the NEPA cost-benefit analysis.

The DES, relying upon the BEIR reports, estimates the somatic (cancer) and genetic effects from routine operation at SHNPP. The principal DES estimate of genetic health effects from SHNPP releases is that for fatal cancers from whole body radiation, the potential effect on the population is .008 cancer/RRY (reference reactor year). (The cancer risk to the maximum exposed individual is one in a million.) This estimate is based upon the BEIR dose response somatic risks estimate.

Of the authors referenced by Joint Intervenors, only Gofman has attempted to calculate risk coefficients and risk factors of the sort developed in the BEIR Reports for cancer risk estimates.3/ He, in turn, relies on the Mancuso/Stewart/Kneale data and so in a sense, he speaks for those authors as well. His error factor is 40%; that is, Gofman projects there will be 40% more cancers than in the BEIR estimates. If we accept this, the above estimate in the DES becomes .0112 for the general population. (Fabrikant Affidavit at Q.70, 72) By any standard available, this adjustment cannot change the cost-benefits analysis in the DES.4/ As Dr. Fabrikant concludes:

3/ Bertell once stated the Mancuso/Stewart/Kneale data may lead to an error factor of 4 to 16 in BEIR; however, as she has acknowledged, she was relying on observations in a preliminary Mancuso/Stewart/Kneale statement which was not included by Mancuso/Stewart/Kneale in their actual report. Morgan proposed an error factor of 4-5, but offered no supporting calculation, reference or scientific basis. Bross states the error in the NIOSH lung cancer calculations are off by a factor of 20-200. However, the estimates in the DES are for whole-body doses, and Bross neither provides an error factor for the BEIR Reports' projections on whole body doses, nor can one be derived from his lung cancer creation. (Fabrikant Affidavit at Q.17)

4/ This conclusion applies equally well to the DES risk estimates for occupational exposure (a matter outside the scope of these contentions -- see Note 1 supra). The DES estimate, utilizing the BEIR reports, is .04 cancer deaths/RRY. Using Gofman's worst case calculations, the number would become .056/RRY. Again, the difference is insignificant. (Fabrikant Affidavit at Q.72)

> The small differences are arithmetically insignificant in comparison with spontaneously occurring effects in the general population; they both fall well within the probability uncertainties; they are infinitesimal; and the calculations do not exclude a zero effect in either situation.

For genetic effects, the DES conclusion is that there is .1 genetic defects/RRY, and again, this is very small compared to naturally occurring effects. This number is derived utilizing the relative-mutation-risk method for equilibrium estimates in the BEIR. (Fabrikant Affidavit at Q.72, 74) As discussed above, the BEIR genetic analysis has not been critized in the peer-reviewed literature. Among authors referenced by Joint Intervenors, the only one to have commented extensively on genetics is Gofman in his book. Gofman, as indicated, has no qualifications in genetics and carries his argument into the realm of illogic. If we should follow him into that realm, however, no change in the DES cost-benefit balance would be called for. Using Gofman's risk estimates, as set forth in his book, the number of potential genetic disorders would be 7.58 times greater or .76 potential genetic disorders. (Fabrikant Affidavit at Q.73-74) As with somatic effects, this change in the genetic effects is far too small to justify any change in the cost benefit analysis in the DES. As Dr. Fabrikant again concludes, the difference are arithmetically insignificant in comparison with spontaneously occuring effects, they fall well within probability uncertainties, they

are infinitesimal and neither calculation excludes a zero effect.

In sum, accepting Joint Intervenors' criticisms of the BEIR reports and the cited references as accurate, nonetheless, no issue of material fact is raised and Applicants are entitled to a judgment as a matter of law on the contentions addressed in Part II above.

IV. Modeling Techniques.

Joint Intervenors' and Mr. Eddleman's principal challenges to the DES health effects estimates concern the BEIR analysis, as discussed above. Joint Intervenors also, however, contest the health effects estimates in the DES on the basis that the underlying modeling techniques are defective. The models used are found in Reg. Guides 1.109 and 1.111-13 (Whipple Affidavit at Q.6) The charges are that the health effects were seriously underestimated because in the modeling there was incorrect treatment of (1) radionuclides included in the calculations, (2) the forms of reactivity in radionuclides, (3) internal absorption of radionuclides, (4) rain-out, hot spots and incomplete mixing and dispersion of radionuclides, and (5) absorption or attachment of radionuclides in or to fly ash. Related to the modeling contentions is a claim that the DES considers health effects for too short a period of time. There is no merit to any of these contentions, none lead to serious

underestimates of health effects and none raise any issue of material fact.

Our comments in this part are based principally upon the affidavits of Dr. Hoyt Whipple and Dr. John J. Mauro. Dr. Whipple and Mr. Mauro are highly qualified health physicists who have devoted their careers to controlling, modeling, and evaluating the effects of radioactive materials discharged from nuclear power plants. Mr. Mauro is responsible for the dose modeling done by Applicants for SHNPP. Dr. Whipple's experience also includes programs to measure release and the study of the consequences of radioactive materials being contained in fly ash. (Whipple Affidavit at ¶ 1-2; Mauro Affidavit at ¶ 1-2)

A. Duration of Health Effects.

In Contention II(c), Joint Intervenors claim the DES seriously underestimates health effects from operation of SHNPP because the DES estimates "effects over an arbitrarily short period of time compared to the length of time the radionuclides actually will be causing health and genetic damage." According to Joint Intervenors, effects should be estimated for the lifetime of all radionuclides released, and, at a minimum, should be estimated for 11,000,000 years. Anything less, say Intervenors, is arbitrarily short. (J.I. Ans. to Int. II-26-28) Intervenors are wrong.

In the NRC Staff's DES, health effects are estimated on an annualized basis from the person/rems delivered for each year of projected plant operation. Substantially lower levels of person/rems will continue after operation has ceased, and the DES does not expressly calculate the health effects therefrom. (Mauro Affidavit at Q.18) This is quite appropriate, certainly not arbitrary, and in no way affects the cost-benefit analysis made in the DES. To estimate health effects as Intervenors suggest, as against the approach taken in the DES, would be both scientifically inappropriate and unnecessary.

The Joint Intervenors' proposed approach is scientifically inappropriate because any resulting estimate would be misleading and specious. The DES estimate covers a period (operating lifetime of a plant) for which health effects are at least arguably foreseeable. Joint Intervenors' approach, on the other hand, requires as a critical assumption that there will be no advance in medicine or health control for hundreds, thousands, and even millions of years. Such an assumption, of course, is utter nonsense. Especially is this true for the health effects here pertinent--cancer and genetic defects, two areas in which there is an incredible medical ferment and development. It would be scientifically irresponsible for a professional to project continuing health effects thousands of years into the future. (Mauro Affidavit at ¶ 19) Accordingly for the NRC staff to have followed the approach in the DES and

to have refrained from making estimates into the uncharted future, far from being arbitrary, is scientifically required. Under NEPA, a good faith effort to describe reasonably foreseeable impacts is sufficient in a NEPA cost-benefit analysis. Scientists' Institute, supra, at 1092.

The DES approach is reasonable, and the Joint Intervenors' suggestion is unnecessary, because the NRC staff has selected for comparison the period in which the comparative proportion of dose and health effects would be greatest for SHNPP. Further computation, accordingly, is unnecessary. In making the cost-benefit analysis in the DES, the NRC staff variously compares dose from SHNPP releases and resulting health effects for a year of reactor operation (RRY) with the dose and health effect from natural background radiation and with health effects spontaneously occurring in the population.5/ The resulting calculated annualized dose (56 person/rem) and effect (.008 cancer deaths,etc.) are neglible in comparison to

---

5/ This approach by the Staff is fully in accord with the Appeal Board's comparative approach in Philadelphia Electric Company (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-701, 16 N.R.C. 1517, 1526 (1982) ("Peach Bottom" wherein the Board determined the NEPA balance for radon 222 (as emitted in the fuel cycle). Appeal is pending from this decision. Docket No. 50-277, filed May 27, 1983. While the Commission in theory could amend the Appeal Board Order, the standards set forth in the Appeal Board decision currently bind the Licensing Board and parties to this proceeding. By those standards, the Staff's comparative approach clearly is proper. If the NRC should adopt some other cost-benefit standard, Applicants and Staff, naturally, would apply that standard.

background radiation levels, spontaneously occurring health effects, or in comparison with any other standard. (Mauro Affidavit at ¶ 20)

While the RRY comparison by the Staff shows negligible health effects, it nonetheless, represents the highest comparative impact for any year following plant shutdown or for any period of time beyond the period of SHNPP's operation. This is because dose or effect in years following plant shutdown never will be greater than a small fraction of dose or effect in any year of operation, while the comparative figure (be it background radiation, spontaneously occurring health effects, or otherwise) will not be so reduced. Thus, in a year following reactor shutdown, the numerator in any ratio (dose or effect attributable to SHNPP's prior operation) will be less than that for a reference reactor year, but the denominator (the comparative natural background radiation, etc.) will be unchanged. Necessarily, the ratio in such a later year will be less than in the reference reactor year. Similarly, if we sum any periods of time (be it 100, 1000, 10,000 or more years) this comparative projection still will not increase. Necessarily, the resulting ratio will be lower than for a reference reactor year, since, again, the additional years will add comparatively less to the numerator than to the denominator. (Mauro Affidavit at ¶ 20)

In purported support of their Contention, Joint Intervenors cite Gofman's book, Caldicott's book, Pigford in January 1982 Nuclear Safety Magazine and the testimony of Chauncy Kepford in the Perkins proceedings as showing the health effects estimate for SHNPP in routine operations was arbitrarily short in time covered. However, Gofman's book does not address duration of health effects estimates for operation of a nuclear power plant, nor does Caldicott's book (Caldicott in any event hardly could be deemed an expert on the matter--see Fabrikant's Affidavit at Q.75). Pigford did not write an article in the referenced magazine issue. (Mauro Affidavit at ¶ 22) Kepford's testimony did not deal with releases during routine operation, and in any event, the very testimony relied upon by Joint Intervenors was rejected by the ALAB, both because it was not credible and because Kepford was not qualified as an expert. See Peach Bottom, supra.

In sum, the NRC staff and the DES has determined the maximum ratio of health effects from SHNPP operation. To make additional calculations that would only lessen that comparative ratio is not only unnecessary, it is nonsensical.

B. Radionuclides Considered in Calculations.

Joint Intervenors' Contentions regarding defective modeling appear in Contentions II(b)(e) and (f). These Contentions should be reviewed in the perspective of the modeling process

as a whole for calculating doses and of the overall conservatism of this process. We will briefly review these general points and then turn to Joint Intervenors' particular Contentions.

1. General Modeling Procedure and Its Conservatism.

The modeling procedure followed by the Applicants and the NRC Staff involves three steps. The first step is to calculate the Source Term of the radiouclides released in liquid and gaseous effluents during normal operation. The second step is to calculate the atmospheric dispersion and aquatic dilution of released radionuclides calculated to be the Source Term. The third and final step of the methodology is to calculate, in accordance with Regulatory Guide 1.109, the radiation doses to the general public attributable to the radionuclides dispersed in the environment. Reg. Guide 1.109 includes 14 equations and over 4,000 calculational parameters, including hundreds of dose-conversion factors. (Mauro Affidavit at ¶ 5)

The modeling procedures need not, under the applicable regulations, calculate all radiation released and all pathways of dispersion; and the Applicants and NRC Staff do not do so in their modeling. At the same time, given the conservatism built into the system for the emissions and pathways that are included, the modeling approach followed by Applicants and Staff can be expected to lead to dose calculations greater than the doses

actually delivered in routine operation. (Mauro Affidavit at ¶ 6, 11, 14-15)

2. Radionuclides Omitted From Calculations.

In Contention II(f), Joint Intervenors contend in part that health effects have been seriously underestimated because certain radionuclides were omitted from the modeling. This contention is directed at the first step in dose calculation--determining the Source Term. It is correct that some radionuclides are omitted from the calculations· however, this will not lead to any underestimate of dose or health effects. (Mancuso Affidavit at ¶ 10)

All radionuclides having a potential for contributing significantly to exposure are included in the Source Term. Those omitted will not lead to underestimate of dose, first, because in the aggregate the radionuclides omitted account for less than 1% in curies of the total releases from the plant in routine operation. This is an insignificant amount. Second, radionuclides included in the Source Term are conservatively calculated, based on operating experience at existing nuclear power plants, to overestimate actual releases from SHNPP. Given the conservatisms and the known experience at other plants, the releases in curies calculated for SHNPP (even with the omission of some radionuclides) can be expected to exceed actual releases from the plant during operation (Mauro Affidavit at ¶ 11.)

Joint Intervenors cite the LEAF study in support of their contentions; however, that study is irrelevant to the issue. The referenced study (which has been severely criticized) addresses only the monitoring program of the Wisconsin Public Health Department. This has nothing to do with the dose modeling in this proceeding (Wisconsin allegedly only considers three radionuclides in its program; modeling and Source Term in this proceeding includes dozens of radionuclides). (Mauro Affidavit at ¶ 12.)

Contrary to Joint Intervenors' Contention, then, omission of limited radionuclides in the modeling does not lead to serious or underestimates of health effects in the DES.

C. Relative Reactivity of Radionuclides.

In Contention II(f), Joint Intervenors contend in part that health effects from SHNPP routine releases are seriously underestimated because in Applicants' and NRC's dose modeling, less, rather than more, reactive forms of radionuclides are used in the computation. Joint Intervenors give as an example the use of plutonium in its No. 6 valence state, as against its No. 3 or No. 4 valence state. In fact, at no time in the modeling procedure is reactivity determined or utilized, Joint Intervenors' Contention, accordingly, is without merit. (Mancuso Affidavit at ¶ 7-8)

Reactivity is not determined in the modeling because the environmental and biological transfer rates and other parameters used in the models are based on measured values obtained by direct observation from laboratory and field studies. In short, in determining these parameters, no assumption is made regarding reactivity. In support of their Contention, Joint Intervenors reference the purported use of one state of plutonium over another. This simply illustrates Joint Intervenors' apparent confusion. Not only is no particular form of reactivity used with respect to plutonium in the modeling, but plutonium will be released in routine operations in quantities so small, if at all, that it will not affect health risk estimates for routine operation at SHNPP. (Mauro Affidavit at ¶ 8-9; Fabrikant Affidavit at Q.15, 60; Whipple Affidavit at ¶ 13-16.)

D. Internal Absorption of Radionuclides.

In Contention II(b), Joint Intervenors contend in part, that health effects have been seriously underestimated because internal absorption of radionuclides was incorrectly modeled. Joint Intervenors, thereby, are questioning the dose conversion factors utilized in the third step of the modeling process. Contrary to Joint Intervenors' position, health effects have not been seriously underestimated on this basis.

As indicated above, the modeling contains 1000's of calculation factors, including 100's of dose-conversion factors. These individual factors are subject to continuing research and at any one time individual numbers may be judged marginally high or low; however, they balance each other without an overall effect on dose. (Mauro Affidavit at ¶ 13-14)

Joint Intervenors make several references in proported support of their position, the principal ones being to the LEAF study and to NRC Translation 520 (Heidelberg Report). With respect to the Leaf Study, the simple answer is that the Study does not challenge, but relies upon, the absorption factors in Reg. Guide 1.109. These, of course, are the very factors used by the NRC Staff and Applicants in their modeling.

As to Translation 520, that report has been thoroughly discredited by the scientific community for its many inaccuracies, misleading treatment of available data and other critical methodological flaws. Further, its authors are university students who represented themselves as being sponsored by the university. This was contrary to fact and against the direct instructions of the president of the university. With respect to the reports dose-conversion factors in particular, these have been determined to be unsupported by the experimental data. Indeed, a co-author of the report has retracted statements he made in support of those very factors. Obviously, this report does not support a challenge to Applicants

and NRC's modeling techniques. Intervenors' other references(to Caldicott, Sternglass and the like) are equally without merit (Mauro Affidavit at ¶ 16 and Exhibit B)

In sum, Applicants' and NRC Staff's modeling of internal absorption of radionuclides has not produced serious underestimates of health effects from SHNPP operation.

E. Rain-out, Hotspots and Incomplete Dispersion.

Contention II(e) revisits allegations made by Intervenor Wells Eddleman in both Contentions 29/30 and 80--i.e., Applicants' dispersion and dose calculation models fail to account for "rainout" or "hot spots" and fail to account for incomplete mixing and dispersion of radionuclides. Applicants have previously moved for summary disposition of Eddleman Contention 80 and have demonstrated that there is no issue of material fact regarding the validity and conservatism of Applicants atmospheric dispersion model.6/ Mr. Whipple also has reviewed the

---

6/ See "Applicants' Motion for Summary Disposition of Intervenor Wells Eddleman's Contention 80 (Atmosphere Dispersion Model)", dated September 1, 1983, supported by (1) "Applicants' Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard on Eddleman Contention 80," (2) "Affidavit of Brian D. McFeaters In Support of Applicants' Motion for Summary Disposition of Intervenor Wells Eddleman's Contention 80" (hereinafter "First McFeaters Affidavit"), (3) "Affidavit of Wayne Lei"; "Applicants' Reply to Wells Eddleman's Motion for Partial Summary Disposition on Eddleman Contention 80," dated September 27, 1983, supported by (1) "Statement of Applicants' Position With Respect To Mr. Eddleman's 'Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard'," (2) "Affidavit of Brian D. McFeaters In Support of Applicants' Reply to Wells Eddleman's Motion For Partial Summary Disposi-

(Continued Next Page)

atmospheric dispersion model set forth in Regulatory Guide 1.111 and offers his expert opinion that the model "takes into account those factors which could result in incomplete mixing and already predicts values for plume concentrations that are conservatively high." (Whipple Affidavit at ¶7; see First McFeathers Affidavit, Exhibit B.)

While wet deposition ("rainout") is not accounted for in the atmospheric dispersion model, it could make a significant contribution to radioactivity concentrations and have an impact on dose only if the area in the vicinity of a nuclear power plant had a pronounced rainy season corresponding to the local grazing season. Such is not the case at the Harris Plant site. (Whipple Affidavit at ¶7; Second McFeaters Affidavit at Exhibit B, page 4; Spickler Affidavit at ¶8). Because of the random and infrequent contribution of wet deposition at any one location, as compared with dry deposition, rainout will have an

---

(Continued)

tion on Eddleman Contention 80" (hereinafter "Second McFeaters Affidavit"), (3) "Affidavit of Maynard E. Smith" (hereinafter "Smith Affidavit"). The NRC Staff supported Applicants' position Affidavit"). The NRC Staff supported Applicants' position regarding the validity of their atmospheric dispersion model. See "NRC Staff Response In Support of Applicants' Motion For Summary Disposition Of Eddleman Contention 80, And In Opposition to Wells Eddleman's Motion For Partial Summary Disposition Of Eddleman Contention 80," filed September 26, 1983, supported by (1) "Affidavit of Irwin Spickler In Support Of Summary Disposition of Eddleman Contention 80" (hereinafter "Spickler Affidavit"), (2) Affidavit of Edward F. Branagan, Jr., In Support Of Summary Disposition of Kenneth C. Dempsey In Support of Summary Disposition Of Eddleman Contention 80."

insignificant effect on annual radioactivity concentrations. (Id.; Smith Affidavit at ¶7, 9.)

The magnitude of projected somatic and genetic health effects from routine operation at SHNPP is related to the radiation dose an individual received for each year of exposure. The total annual dose is composed of incremental doses received along a variety of pathways: inhalation, external exposure and ingestion of various food materials. Any "hot spots", whether from wet deposition, incomplete mixing, or incomplete dispersion, will occur randomly and infrequently. The slightly higher exposure which may result for a short period of time is averaged out over the period of a year. The NRC recommended models take this variety of exposures over time into account and thus doses and health effects are unaffected by incomplete mixing, incomplete dispersion, raintout and hot spots. (Whipple Affidavit at ¶8.)

F. Coal Fly Ash.

In Contention II(e), Joint Intervenors contend health effects are seriously underestimated because Applicants' and NRC Staff's models fail to account for radionuclides being attached to or absorbed in fly ash from coal plants. The problem, say Joint Intervenors, is deposition of these coal particles directly in the deep lung, and the problem is most severe with smaller particles (less than .5 microns in

diameter), but also applies to larger particles. Joint Intervenors cite fly ash and rabbit studies in support. (J.I. Ans. to Int. II-40-41, 62) The Contention is without merit.

Fly ash, indeed, was not considered in modeling by the NRC Staff and the Applicants. Had it been, the dose to humans, and therefore the potential health effects, would be reduced. Consideration of fly ash, in short, would have made the models more conservative. (Whipple Affidavit at ¶ 9) This result follows from two facts. First, as Joint Intervenors recognize, larger particles are less likely to penetrate into the deep lung and remain there than small particles. If radionuclides combine with fly ash, this will result in particles larger than the originals and, accordingly, the radionuclides will become less likely to enter and remain in the deep lung. (Whipple Affidavit at ¶ 10)

Second, fly ash particles tend to be highly insoluble. Thus, as Dr. Whipple states:

> [T]he absorption or attachment of radioactive gases and soluble radioactive materials in or to fly ash particles tends to place them in an insoluable form. In this form they are less available for transport along food pathways than they were in their original form, and are less likely to irradiate humans. (Whipple Affidavit at ¶ 11)

As to Joint Intervenors' citations, purportedly supporting Joint Intervenors' contention, the short answer is that these references have absolutely nothing whatever to do with the

matter of radioactive material being attached to or absorbed in coal fly ash. (Whipple Affidavit at ¶12) Joint Intervenors' contention regarding fly ash, obviously, raises no issue of material fact regarding the DES health effect estimates.

CONCLUSION

Applicants respectfully submit that there is no material issue of fact with regard to any aspect of Joint Contention II or Eddleman Contention 37B. The BEIR Reports used by the Staff in compiling the DES for SHNPP are widely recognized as authoritative by leading experts in the radiological health effects area. The Commission has held that the use of these reports is evidence that the risk of health effects was considered appropriately. To support the BEIR Reports Applicants have produced affidavits of qualified experts to demonstrate that Intervenors' attack on the BEIR Reports is without merit. Furthermore, Applicants have shown that even if Intervenors' risk estimates could somehow be accepted as meritorious, there would be no significant effect on the DES estimate of health effects from routine releases at SHNPP. Finally, Applicants have produced conclusive evidence to rebut Intervenors' assertion that Applicants' modeling techniques under-estimate potential health effects from operation at SHNPP. Because every point "contested" by the Intervenors has been shown to be without

merit, summary disposition of Joint Contention II and Eddleman 37B is appropriate at this time.

Respectfully submitted,

Thomas A. Baxter, P.C.
Dean D. Aulick, P.C.
John H. O'Neill, Jr.
Counsel For Applicants

SHAW, PITTMAN, POTTS & TROWBRIDGE
1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1000

Richard E. Jones
Samantha Francis Flynn
CAROLINA POWER & LIGHT COMPANY
P.O. Box 1551
Raleigh, North Carolina 26602
(919) 836-7707

Dated: October 3, 1983

September 29, 1983

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' MEMORANDUM OF LAW IN SUPPORT OF MOTIONS FOR SUMMARY DISPOSITION ON INTERVENOR WELLS EDDLEMAN CONTENTIONS 64(f), 75, 80 AND 83/84

I. Introduction

Contemporaneously herewith, Applicants Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency filed four motions with the Atomic Safety and Licensing Board seeking summary disposition, pursuant to 10 C.F.R. § 2.749, of Contentions 64(f), 75, 80 and 83/84, which were advanced by Intervenor Wells Eddleman.1/ In order to avoid repetition, Applicants set forth in this single memorandum of law the general

---

1/ The motions on Contentions 64(f) and 80 accompany this memorandum. Applicants' motions with respect to Contentions 75 and 83/84 are being filed under separate cover.

standards by which motions for summary disposition are to be decided.

II. Timeliness

The motions for summary disposition of Eddleman Contentions 75, 80 and 83/84 are filed pursuant to the Board's Memorandum and Order (Reflecting Decisions Made Following Second Prehearing Conference) at 6 (March 10, 1983), which established September 1, 1983 as the last day for filing motions for summary disposition with respect to these environmental contentions. Consequently, the motions clearly are timely filed. Further, the motions are ripe for decision by the Board, notwithstanding the fact that motions to compel discovery of Applicants have been filed by Mr. Eddleman and are pending before the Board.2/ Discovery has been open on these contentions since September 22, 1982, when the Board admitted them for adjudication. Mr. Eddleman was advised on January 6, 1983 that Applicants would seek summary disposition of these contentions, so that failure to pursue discovery was at his own risk. See letter to the Board from Applicants' counsel, January 14, 1983, with attached meeting minutes.

While Applicants could have filed their motion on Contention 64(f), a safety contention, at a later time, discovery on

---

2/ No outstanding discovery requests otherwise are pending with respect to these contentions.

that contention likewise has been available for almost one year and, for the reasons stated in the motion, it is ripe for decision by the Board.

Therefore, the existence of discovery disputes on these contentions is entirely a situation created by Mr. Eddleman, and from which he should not be allowed to profit by forestalling the Board's consideration of timely motions for summary disposition.3/

III. Governing Legal Standard

The admission of a contention for adjudication, under the standards of 10 C.F.R. § 2.714, is not an appraisal of the merits of a contention, but merely a determination that it meets the criteria of specificity, asserted basis and relevance. A hearing on an admitted contention, however, is not inevitable. Licensing boards are authorized to decide an admitted contention on its merits in advance of trial on the basis of pleadings filed.

"Any party to a proceeding may move, with or without supporting affidavits, for a decision by the presiding officer in that party's favor as to all or any part of the matters involved in the proceeding." 10 C.F.R. § 2.749(a). The standard embodied in the regulation is that "[t]he presiding officer shall render the decision sought if the filings in the

---

3/ In addition, we note that only a handful of interrogatories are at issue.

proceeding, depositions, answers to interrogatories, and admissions on file, together with the statements of the parties and the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a decision as a matter of law." 10 C.F.R. § 2.749(d).

The Commission and its adjudicatory boards have long encouraged the use of this summary disposition process where the proponent of a contention has failed to establish that a genuine issue exists, so that evidentiary hearing time is not unnecessarily devoted to such issues. Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 N.R.C. 452, 457 (1981); see also Houston Lighting and Power Company (Allens Creek Nuclear Generating Station, Unit 1), ALAB-590, 11 N.R.C. 542, 550 (1980) (". . .the Section 2.749 summary disposition procedures provide in reality as well as in theory, an efficacious means of avoiding unnecessary and possibly time-consuming hearings on demonstrably insubstantial issues . . .").

The standards governing summary disposition motions in an NRC proceeding are quite similar to the standards applied under Rule 56 of the Federal Rules of Civil Procedure. Alabama Power Company (Joseph M. Farley Nuclear Plant, Units 1 and 2), ALAB-182, 7 A.E.C. 210, 217 (1974); Tennessee Valley Authority (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), ALAB-554, 10 N.R.C. 15, 20 n.17 (1979). Where, as here, motions for summary disposition are properly supported pursuant to the

Commission's Rules of Practice, a party opposing the motions may not rest upon the mere allegations or denials of its answers. Rather, an opposing party must set forth specific facts showing that there is a genuine issue of fact. 10 C.F.R. § 2.749(b). A party cannot avoid summary disposition on the basis of guesses or suspicions, or on the hope that at the hearing Applicants' evidence may be discredited or that "something may turn up." Gulf States Utilities Company (River Bend Station, Units 1 and 2), LBP-75-10, 1 N.R.C. 246, 248 (1975).

The governing regulation permits summary disposition ". . . as to all or any part of the matters involved in the proceeding." 10 C.F.R. § 2.749(a). Just as summary disposition may be granted as to some but not all contested issues, so may summary disposition be granted as to one or more parts of an intervenor's contention. The format or organizational style employed by the pleader of contentions should not prevent a licensing board from deciding that, as to discrete matters of fact and/or law, there is no genuine issue to be heard with respect to one or more aspects or parts of a given contention. Thus, where summary disposition may not be appropriate as to the whole of a given contention, a licensing board may and should determine what issues within the contention are not genuinely disputed, and set only disputed issues for trial.

Applicants submit that the four motions filed contemporaneously are all meritorious and should be granted as a matter of law in their entirety. Each motion demonstrates that there

is no genuine issue of material fact to be heard. If, however, the Board were to be of the view that Mr. Eddleman has demonstrated that one or more genuine issues exist as to a given contention, the Board should exercise its authority to narrow the issues for trial by disposing of those portions of contentions regarding which no genuine issue exists.

Respectfully submitted,

Thomas A. Baxter

Thomas A. Baxter, P.C.
John H. O'Neill, Jr.
SHAW, PITTMAN, POTTS & TROWBRIDGE
1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1090

and

Richard E. Jones
Samantha F. Flynn
CAROLINA POWER & LIGHT COMPANY
P.O. Box 1551
Raleigh, North Carolina 27602
(919) 836-7707

Counsel for Applicants

Dated: September 1, 1983