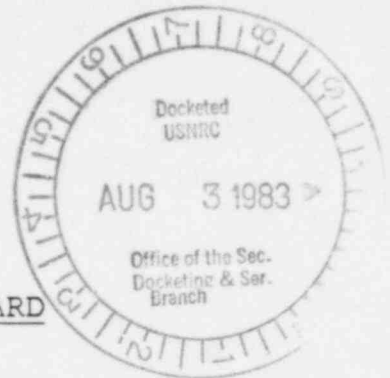


RELATED CORRESPONDENCE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' RESPONSES TO JOINT INTERVENORS'
GENERAL INTERROGATORIES AND INTERROGATORIES ON
CONTENTIONS IV, V AND VI TO APPLICANTS CAROLINA
POWER & LIGHT COMPANY, ET AL. (FIRST SET)

Applicants Carolina Power & Light Company ("CP&L") and North Carolina Eastern Municipal Power Agency, pursuant to 10 C.F.R. § 2.740b, hereby submit the following responses to "Joint Intervenor's' Interrogatories on Contentions IV, V, and VI to Applicants Carolina Power & Light Company, et al. (First Set)." Applicants' provision of answers to Joint Intervenor's' interrogatories should not be deemed an admission of relevancy with regard to the information provided by Applicants or that sought by the Joint Intervenor's.

RESPONSES TO GENERAL INTERROGATORIES

INTERROGATORY NO. 1. State the name, present or last known address, and present or last known employer of each person known to the Applicants to have first-hand knowledge on which the responses are based, in each of the contentions which are the subject to this set of interrogatories.

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ANSWER. The following list identifies those persons who provided information upon which Applicants relied in answering the interrogatories on Joint Contention Nos. IV, V and VI and indicates the particular interrogatory answer(s) for which each such person provided information.

| <u>PERSON</u> | <u>INTERROGATORY NO(s).</u> | <u>SUBJECT MATTER</u> |
|----------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stephen Browne | 14, 15, 16 | Mr. Browne provided responses to those interrogatories or portions of interrogatories related to dosimetry. |
| Ronald Shearin | 14, 16, 19, 21 | Mr. Shearin provided responses to those interrogatories or portions of interrogatories related to environmental monitoring sampling and measurement of fission products. |
| Henry Till | 14, 16, 19, 20, 21 | Mr. Till provided responses to those interrogatories or portions of interrogatories related to in-plant monitoring, sampling, and measurement of fission products. |

The above individuals are employees of Carolina Power & Light Company, Shearon Harris Energy and Environmental Center, Route 1, Box 327, New Hill, North Carolina 27562.

INTERROGATORY NO. 2. Identify those facts concerning which each such person has first-hand knowledge.

ANSWER. See answer to Interrogatory No. 1.

INTERROGATORY NO. 3. State the specific basis or facts which support each response.

ANSWER. All facts relied upon by those individuals identified in the answer to Interrogatory No. 1 are indicated within each response to the specific interrogatories on Contentions IV, V and VI.

INTERROGATORY NO. 4. State the name, present or last known address, and present or last employer of each person who provided information upon which the Applicants relied in answering each interrogatory herein.

ANSWER. See answer to Interrogatory No. 1.

INTERROGATORY NO. 5. Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

ANSWER. See answer to Interrogatory No. 1.

INTERROGATORY NO. 6. State the name, address, title, employer, and educational and professional qualifications of each person the Applicants intend to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

ANSWER. Applicants have not yet identified the expert(s) or other witness(es) they expect to call in this proceeding. When witnesses are identified, Applicants will supplement this response in timely manner.

INTERROGATORY NO. 7. Identify the contention(s) regarding which each person in Interrogatory 6 is expected to testify.

ANSWER. See answer to Interrogatory No. 6.

INTERROGATORY NO. 8. State the subject matter to which each person in Interrogatory 6 is expected to testify.

ANSWER. See answer to Interrogatory No. 6.

INTERROGATORY NO. 9. Identify all documents in Applicants' possession, custody, or control, including all relevant page citations, pertaining to the subject matter of, and upon which the Applicants relied in formulating responses in each contention which is the subject of this set of interrogatories.

ANSWER. All documents relied upon by those individuals identified in the response to Interrogatory No. 1 are indicated within each response to the specific interrogatories on Contentions IV, V and VI.

INTERROGATORY NO. 10. State the specific response in each contention which Applicants contends each document supports.

ANSWER. See answer to Interrogatory No. 9.

INTERROGATORY NO. 11. Identify all documents in Applicants' possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

ANSWER. See answer to Interrogatory No. 9.

INTERROGATORY NO. 12. Identify all other sources of information, not identified in response to Interrogatories 5, 8 and 11, which was used in answering the interrogatories set forth herein.

ANSWER. Applicants have identified all such other sources of information, if any, within the answers to the specific interrogatories set forth herein.

INTERROGATORY NO. 13. Identify all documents which the Applicants intend to offer as exhibits during this proceeding to refute contentions which are the subject of this set of interrogatories.

ANSWER. Applicants have not yet identified those documents they intend to offer as exhibits on Contentions IV, V and VI.

RESPONSES TO SPECIFIC INTERROGATORIES
ON CONTENTIONS IV, V AND VI

In a letter dated June 27, 1983, Joint Intervenors, through their attorney, provided Applicants with a revised version of their interrogatories on Joint IV, V and VI. Rather than propounding specific interrogatories with regard to specific contentions, Joint Intervenors merely numbered their interrogatories sequentially and in a cover letter to Applicants' attorney, indicated which interrogatories they deemed relevant to each contention. In several cases, Joint Intervenors indicated that a specific interrogatory was applicable to more than one contention. Applicants disagree with Joint Intervenors' attempt to characterize specific interrogatories as relevant to more than one contention. It has therefore been necessary, in responding to these interrogatories, for Applicants to object as to relevance to certain contentions while

answering the same questions with regard to another contention. Applicants' objections are noted within the response to each interrogatory.

INTERROGATORY NO. 14 (IDENTIFIED BY INTERVENORS AS RELEVANT TO JOINT CONTENTION IV AND JOINT CONTENTION VI).

a) Please state whether any TLD's to be used at the Harris Plant are able to give continuous remote readings of radiation.

b) If any TLD is identified above, please specify where that TLD will be used at the Harris Plant, who its manufacturer is, what its range is, how often it will be read during a general emergency, how often it will be read during normal operating conditions, and how it will be read.

ANSWER/PARTIAL OBJECTION. With regard to Contention VI, Applicants object to this interrogatory on the grounds that it is irrelevant to the contention as accepted and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above-stated objection, Applicants' response to Joint Intervenor's interrogatory is as follows:

a) No.

b) Not applicable.

INTERROGATORY NO. 15 (IDENTIFIED BY INTERVENORS AS RELEVANT TO JOINT CONTENTION IV).

a) Please state whether continuous recording equipment is available for pressurized ionization monitors.

b) Please state whether remote reading equipment or computer readouts are available for pressurized ionization monitors.

c) Please state whether real time or remote readout capability is available for pressurized ionization monitors.

d) If any such capability as asked above is not available for pressurized ionization monitors, do Applicants believe that such an ability could be developed, or would be developed, if Applicants contracted for it with a maker of computer instrumentation or pressurized ionization monitors.

e) If the answer to subpart d above is other than affirmative, state in detail all facts which support your answer.

f) If the answer to subpart d above is affirmative in any respect, please state what increase in cost might be required and what information Applicants have which supports this answer. Please identify all documents which may support this answer.

ANSWER.

a) Yes.

b) Yes.

c) Yes.

d) Not applicable.

e) Not applicable.

f) Not applicable.

INTERROGATORY NO. 16 (IDENTIFIED BY INTERVENORS AS RELEVANT TO JOINT CONTENTIONS IV, V AND VI).

Please state the following information concerning each kind of the following types of monitors or dosimeters to be employed at the Shearon Harris Plant; I) TLD's, II) continuous air monitors and portable air samplers, III) in-plant and off-site monitoring equipment that would or could be used in the event of an emergency:

a) The manufacturer or manufacturers of such monitors or dosimeters, including their address.

b) The number of each such monitors or dosimeters.

c) The accuracy of each such monitor or dosimeter together with a concise statement of how that accuracy was determined; whether the Applicants determined it or someone else determined it; what the qualifications of the person who made this determination of accuracy of this dosimeter were; when this determination of dosimeter accuracy was made; what the

accuracy is in plus or minus percent, or percent over and percent under for each of the following types of radiation:

- (i) Gamma below 1mev
- (ii) Gamma 1-10mev
- (iii) Gamma above 10mev
- (iv) Beta below 100kev
- (v) Beta 100-1000kev
- (vi) Beta 1000-10000kev
- (vii) Beta 10000-100000kev
- (viii) Beta 100000-1000000000kev
- (ix) Beta above 1000000000kev
- (x) Alpha, specifying what energy ranges each dosimeter is sensitive to alpha radiation.
- (xi) Neutrons, specifying what energy ranges each dosimeter is sensitive to neutron radiation.
- (xii) Protons, specifying what energy ranges each dosimeter is sensitive to proton radiation.
- (xiii) Any other radiations to which each dosimeter is sensitive.

For each such sensitivity range listed above, please provide a list of all documents which establish such sensitivity range. State whether each such document is in Applicants possession. Provide the names of the persons who prepared such document, a list of their qualifications if known to Applicants for preparing such document, the date such document was prepared, and whether the exact same dosimeter as referenced in the FSAR or in the answers to other sections of this interrogatory above was used in the testing that is referenced in each such document for each dosimeter.

ANSWER. For purposes of this response, Applicants assume that subsection (I) of Interrogatory 16 is applicable to Contention IV, that (II) is applicable to Contention V and that (III) is applicable to Contention VI.

16(I)(a) At the present time SHNPP intends to use TLD badges manufactured by Matsushita Industrial Equipment Co. (Panasonic Company), Toyonaka, Osaka, Japan.

(b) The number of TLD badges depends on the number of workers who require monitoring. This cannot be determined at this time. Each such worker will be provided with a TLD badge.

(c) The TLD badges which SHNPP intends to use have been tested and found to meet the performance specifications of ANSI N13.11(1983) for photons and betas. The testing was conducted at the University of Michigan by Dr. Phil Plato as part of a study sponsored by the United States Nuclear Regulatory Commission. During the study the dosimeters were irradiated to a variety of radiation sources whose calibrations were verified by the National Bureau of Standards. The test categories included low energy photons, high energy photons, beta particles, and mixtures of the above radiation types and energies. The badges were read by CP&L and the results were evaluated against the acceptance criteria by Dr. Plato at Michigan. The methods used during this study are documented in NUREG CR-2892 (February 1983) and the results of testing are documented in NUREG CR-2891 (February 1983). CP&L is listed as processor number 187 in these reports.

ANSI N13.11(1983) specifies dosimeter performance criteria in terms of both accuracy and precision combined into a single limit, rather than as a plus or minus percentage. For

all photon and beta particle categories of the study the TLD badge passed the acceptance limit. With respect to specific radiation types and energies:

- (i) Passed ANSI N13.11(1983) criteria.
- (ii) Not included in ANSI N13.11(1982), but the energy dependence of thermoluminescence output for photons is flat within the limit of 10 percent from 40 keV to 7 MeV.
- (iii) This range is not applicable to energies found in worker-accessible areas at nuclear power facilities.
- (iv) Beta particles in this range represent a negligible external radiation hazard because of the very low penetrating power and are not of interest in external dosimetry.
- (v) Not included in ANSI N13.11(1983), but the accuracy has been evaluated to be within 15 percent with appropriate calibration and dose evaluation methods.
- (vi) Passed ANSI N13.11(1983) criteria.
- (vii) This energy range is not found in nuclear power facilities.

- (viii) This energy range is not found in nuclear power facilities.
- (ix) This energy range is not found in nuclear power facilities.
- (x) Alpha radiation is not an external hazard; therefore, this range is not applicable to external dosimeters.
- (xi) The TLD badge contains two elements which are sensitive to neutrons at thermal energies and above and two elements which are insensitive to all neutrons. At this time the TLD badge is not used for determining dose from neutrons, although evaluations are in progress to use the badges for this purpose.
- (xii) This type of radiation is not found in nuclear power plants.
- (xiii) None.

The following documents were referred to in responding to this interrogatory:

1. M. Takenaga, O. Yamamoto, T. Yamashita, "A New Phosphor LiBO:Cu for TLD," HEALTH PHYSICS, VOL. 44, No. 4 (April).

2. H. Ishiguro, S. Takeda, "Method for Evaluation of Alpha and Beta Doses," HOKEN BUTSURI, Vol. 16, 305-316 (1981).
3. P. Plato, J. Miklos, "Performance Testing of Personnel Dosimetry Services: Final Report of Test #3," NUREG CR-2891, February 1983.
4. P. Plato, J. Miklos, "Performance Testing of Personnel Dosimetry Services: A Revised Procedural Manual," NUREG CR-2892, February 1983.

The above documents are in the Applicants' possession. The studies described in these documents utilized the same model of dosimeter that will be used at SHNPP.

16(II) In-Plant Monitoring Equipment

(a) This information is not available at this time. Applicants will supplement this response in timely manner.

(b) It is anticipated that approximately 16 continuous air monitors and portable air samplers will be used per unit at the Harris plant. It is anticipated that 120 in-plant radiation monitors will be used. See FSAR § 11.5.2-1.

(c) The precise accuracy of the monitoring equipment is uncertain at this time. Applicants will supplement this response in timely manner.

16 (II) Portable air samplers used off site in the event of an emergency:

| <u>Model</u> | <u>Number of Monitors Currently in Team Kits</u> |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Air Sampler, Portable Model TFlA Staplex, Air Sampler Division 777 Fifth Avenue Brooklyn, New York 11232 | 4 |
| Air Sampler, Portable Model DOL-101-AA Gast Manufacturing Corp. Benton Harbor, Michigan | 4 |
| Pressurized Gas Sampler (portable) Applied Physical Technology 2734 S. Cobb Smyrna, Georgia 30080 | 1 |

Fixed air samplers used offsite:

| <u>Model</u> | <u>Quantity</u> |
|---------------------------------------------------------------------------------------------------------------------------|-----------------|
| Nuclear Air Sampler Model NRC-2000 Analytical Process Instruments, Inc. 3822 Oak Lane Marietta, Georgia 70062 | 5 |

(c) The accuracy of the air-flow data of these air samplers is maintained within ± 15 percent using a Kurz mass flow meter in line with the appropriate sampling filters and cartridges in place. The mass flow meter has NBS-traceable calibration documentation. The calibration is performed by CP&L procedure-trained technicians using established, reviewed, and approved procedures.

The radiological analysis of the sample is performed in either the environmental radiological laboratory or the mobile laboratory facility by procedure-trained technicians. The analysis laboratories use a Nuclear Data Model ND6685 gamma spectroscopy system with germanium intrinsic detectors. These systems undergo daily calibration checks while in operation. All calibrations are performed using NBS-traceable standards. The accuracy of each measurement is dependent on the activity of the sample and decreases with increasing activity. At the lower limits of detection specified in the proposed technical specifications, the maximum error would be approximately 30 percent. The counting error is reported with each analysis, but no universal accuracy value can be cited. Gamma measurements are performed routinely for energy ranges from 70 keV to 1.5 MeV.

Beta and alpha measurements are performed using a Tennelec Model LB5100II manufactured by:

Tennelec, Inc.
601 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830-2560

The low beta and gamma spectroscopy system undergoes a daily quality control check when in operation using NBS-traceable standards. Calibrations are performed by established, approved procedures implemented by procedure-trained technicians. The accuracy of the instrumentation is dependent on the quantity of activity in a sample being analyzed. The LLD of the system meets those specified in the

proposed radiological environmental technical specifications (RETS).

16(III) The following equipment is available for use in the event of an emergency:

| <u>Item</u> | <u>Accuracy</u> | <u>Procedure</u> | <u>Quantity</u> |
|-----------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|-----------------|
| <u>Radiation Survey Instruments</u> | | | |
| Eberline Teletectors Eberline Instrument Co. Box 2108 Sante Fe, New Mexico 87501 | | Not yet determined. | 10 |
| Eberline #RO2A, Ion-Chamber Meter | | Not yet determined. | 15 |
| Ludlum #177, GM Survey Meter | +15% | Electronic calibration | 20 |
| Eberline #PRM-6 with Alpha Survey Probes | +10% | Electronic calibration | 2 |
| Eberline #PRS-2P/NRP, Portable Neutron Counter | | Not yet determined. Calibration probably will be done by National Bureau of Standards. | 1 |
| Ludlum #19 Micro R Meter | +10% | Electronic calibration | 5 |
| RO-4A | +10% | Electronic calibration | 5 |
| <u>Air Samplers</u> | | | |
| Low Volume - ITT G4-4V International Telephone & Telegraph Co. 460 Central Avenue Monroe, Louisiana 71203 | +20% | Will be calibrated by standard from National Bureau of Standards. | 10 |

| | | | |
|----------------------|------|--------------------|----|
| High Volume | +20% | Will be calibrated | 10 |
| Staplex TFIA | | by standard from | |
| Staplex Co. | | National Bureau | |
| 777 5th Avenue | | of Standards. | |
| Brooklyn, N.Y. 11232 | | | |

Dosimetry Equipment

| | | | |
|----------------------------|------|---------------|-----|
| Pencil Dosimeters | 5% | Full scale | 500 |
| (500 mR) | | calibration | |
| Model 883 | +10% | Exposure test | |
| Dosimeter Corp. of | ±2% | Drift test | |
| America | | | |
| 6106 Interstate Circle | | | |
| Cincinnati, Ohio 45242 | | | |
| | | | |
| Pencil Dosimeters | 5% | Full scale | 500 |
| (5000 mR) | | calibration | |
| Model 611 | +10% | Exposure test | |
| Dosimeter Corp. of America | ±2% | Drift test | |
| | | | |
| Pencil Dosimeters | 5% | Full scale | 50 |
| (20000 mR) | | calibration | |
| Model 622 | +10% | Exposure test | |
| Dosimeter Corp. of | ±2% | Drift test | |
| America | | | |
| | | | |
| Dosimeter Chargers | 5% | Full scale | 10 |
| Model 909 | | calibration | |
| Dosimeter Corp. of | +10% | Exposure test | |
| America | ±2% | Drift test | |

Environmental Monitoring Instrument Survey Equipment

| <u>Model</u> | <u>Description</u> | <u>Quantity</u> |
|--------------|--------------------------------------------|-----------------|
| PRS-1 | "Rascal" portable ratemeter with scales | 4 |
| HP-210 | Beta window pancake with GM probe | 4 |
| SPA-3 | Scintillation gama probe | 4 |
| LEG-1 | Low-energy gama probe | 4 |

| | | |
|--------|----------------------------------|---|
| AC-3-7 | Scintillation alpha probe | 4 |
| HP-290 | Gamma probe (energy compensated) | 4 |

The survey equipment identified above is manufactured by:

Eberline Instrument Co.
Box 2108
Santa Fe, New Mexico 87501

INTERROGATORY NO. 17 (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTIONS IV AND VI).

FSAR 12.5.3.6.2, internal radiation exposure assessment, states that "whole body counting and/or bio assay techniques are used to compare the quantity of radioactive material present in the body to that quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform airborne concentration specified in Appendix B, Table 1, Column 1 of 10 CFR 20." Please state:

a) Whether Applicants agree that this sentence appears as quoted above in the FSAR.

b) Whether applicants consider such a dose that would result from inhalation for 40 hours per week for 13 weeks at the uniform airborne concentration maximum limits specified in Appendix B, Table 1, Column 1 of 10 CFR 20 are acceptable under ALARA.

c) If your answer to subpart b) above is other than affirmative, please state what maximum level of radioactive material present in the body is acceptable to applicants for any employee at the Harris plant.

d) State the maximum and average error of whole body counting for each radionuclide which is listed in Appendix B, Table 1, Column 1, of 10 CFR 20 for the equipment to be used at the Shearon Harris Plant.

e) Identify the manufacturer and provide a complete description of all equipment used for whole body counting, including its ability to detect radiation from each nuclide listed in Appendix B, Table 1, Column 1, of 10 CFR 20 subpart 6.

f) For each nuclide listed in response to subparts above, please state the maximum and average error of the

equipment to be used at Harris for whole body counting with respect to the following nuclide concentrations:

- (i) At the maximum level which would result from exposure for 40 hours per week for 13 weeks at the maximum uniform airborne concentration specified in Appendix B, Table 1, Column 1, 10 CFR 20.
- (ii) At 50% of that value.
- (iii) At 10% of that value.
- (iv) At 1% of that value.
- (v) At 0.1% of that value.

g) Explain, for each nuclide identified in response to subparts above, exactly how the concentration in the body that would result from inhalation for 40 hours per week for 13 weeks at the uniform airborne concentration specified in Appendix B, Table 1, Column 1, 10 CFR 20 was determined, and exactly who, among Applicants staff, has made this calculation; or, if it has not been made, who will make it. Give the steps in calculating it including any assumptions used and any references used. Please identify all documents or references used in making this calculation. Please state the qualifications of the person who will make or has made the calculation, and identify all other documents which contain such calculation or which support such calculation which are in Applicants possession.

OBJECTION. Applicants object to this interrogatory on the grounds that it is not relevant to Contention IV or VI and is not reasonably calculated to lead to the discovery of admissible evidence.

Contention IV addresses the Joint Intervenors' concern that Applicants' use of TLDs will be insufficient to ensure that external exposure to radiation hazards is accurately and promptly assessed. Interrogatory No. 17, however, asks a series of questions related to whole body counting and

bio-assay techniques - analyses that are designed to measure internal, not external, exposure to radiation. Internal radiation exposure simply cannot be correlated with external exposure in a direct, reliable manner. Thus, whole body counting and bio-assay techniques are irrelevant to Contention IV.

Contention VI concerns Applicants' ability to ensure timely responses to emergency situations in-plant and off-site. Whole body counting and bio-assay techniques are time-consuming procedures not intended to be used in assessing and responding to emergency situations. Applicants have no intention of relying on these techniques for first detection of the abnormal levels of radioactivity that might occur in an emergency situation.

In addition, whole body counting and bio-assay techniques are not used to measure the amount of specific radionuclides released inside or outside the plant. Applicants rely on other methods of analysis, including air monitoring, effluent sampling and other environmental tests to detect the presence of any potential environmental hazards. Whole body counting and bio-assays are not appropriate devices for assessing external releases. Questions about those internal exposure analyses cannot lead to the discovery of evidence that would be admissible on Contention VI.

INTERROGATORY NO. 18 (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTIONS IV AND VI).

Please state the radiation exposure which is recorded in the records of Applicants for each person who has ever worked

at the Robinson Plant, the Brunswick Plant, or at any other nuclear power plant which was or is owned in part or whole by Carolina Power & Light Company or North Carolina Eastern Municipal Power Agency. If you consider that supplying this information with the name of each individual would violate any privacy consideration, please state precisely what privacy consideration is involved and give a unique number to each individual and supply the information related to that individual in all subparts of this interrogatory below with reference to that number assigned uniquely to each individual.

a) State the total amount of internal radiation exposure for each individual, identifying the plant or plants at which such exposure occurred, and the time period over which the exposure occurred.

b) State the amount of external radiation exposure for each individual, identifying the plant or plants at which such exposure occurred, and the time period over which the exposure occurred.

c) Has Carolina Power & Light determined the error range in plus or minus percent or plus or minus milligrams or over or under error of such exposure for any employees?

d) If the answer to subpart c) above is affirmative for any individual, please state for that individual the accuracy of the dose measurement as stated in the records of Carolina Power and Light.

e) For each item of information specified above, has that information been made available to the Nuclear Regulatory Commission?

f) Has the information listed in response to each subpart of this interrogatory above been made available to the individual whose exposure was being recorded, including the error information?

g) Does Carolina Power & Light possess the last known names and addresses and telephone numbers of any individuals who have ever worked in a temporary position at the Robinson Plant or the Brunswick Plant?

h) If the answer to subpart g) is affirmative, for any individual, please identify the individual by name or number.

i) What measures, if any, has Carolina Power & Light taken to guard against individuals using a false name, false I.D., or false social security number in order to do temporary work under two or more names at its power plants. Please specify all such measures in detail. If any individuals have been

detected by the measures stated in response to this interrogatory attempting to so be employed under two or more names in radiation work at either Robinson or Brunswick or both, please provide the particulars of when, where, and how such individual was detected, and identify the individual.

OBJECTION. Applicants object to this interrogatory on the grounds that it is overbroad, unduly burdensome and irrelevant to the contentions admitted in this proceeding. Radiation exposure of workers at the Robinson, Brunswick or any other plant has no relevance whatsoever to the SHNPP licensing proceeding. Contention IV relates to TLD accuracy. Contention VI relates to the capability of Applicants' monitoring systems to detect specific radionuclides and abnormal levels of releases. Detailed records of individual worker exposures are not relevant to either of these contentions. This is especially true where the information sought relates to all past and present workers at other nuclear power facilities, many of whom may no longer be involved in this industry or even reside in the area of the Harris plant.

Furthermore, identification and description of Applicants' records from the Robinson and Brunswick plants would be a tremendous burden for Applicants to undertake. Yet it is difficult to see what benefit Joint Intervenors would gain from Applicants' exercise. The information could not possibly be admissible with regard to contentions IV and VI, nor could it lead to the discovery of evidence admissible on these contentions.

INTERROGATORY NO. 19 (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTION V).

a) Do Applicants believe that ALARA does not require them to have the most accurate available instrumentation for measuring radiation exposure in areas where their employees are working?

b) If the answer to subpart a) above is affirmative, please state all facts which Applicants contend support such an answer and identify all documents which Applicants believe support such answer. State whether each such document is in Applicants possession, who prepared it, when they prepared it, what their qualifications were to prepare it, and exactly how it supports Applicants answer to subpart a) above.

c) If the answer to subpart a) above is other than affirmative in any way, please state whether Applicants have obtained the most accurate portable air samplers and continuous air monitors which are commercially available.

d) If the answer to subpart c) above is affirmative, please state for each such monitor, who the manufacturer is, how many of them are available at Harris, what areas that monitor will be used in, what its accuracy is, and state also the accuracy of all other monitors for air sampling or continuous air monitoring which are available commercially and which do not have an error range above that of this monitor. An error range above that of the monitor means one which is larger in percentage or larger in absolute amount of radiation detected than that of the monitor which Applicants propose to use at Harris.

ANSWER.

a) Yes.

b) The definition of ALARA as outlined in 10 CFR 50, Appendix I, does not address or imply any requirement to utilize the most accurate available instrumentation for measuring radiation exposure. The utilization of conservative assumptions in measurement of radiation exposure is more consistent with the principles of ALARA than is the utilization of accurate instrumentation. Accurate instrumentation would enable the operator

of a nuclear facility to allow an individual to receive exposure very close to the limits allowed by Appendix I. When Applicants use conservative assumptions of exposure, however, an individual will necessarily receive exposure far less than the permissible limits. This approach ensures compliance with the ALARA goal.

There are other criteria along with accuracy which must be considered in the selection of instrumentation for measuring radiation exposure in areas where employees and contractors are working. These other criteria include:

- * portability;
- * versatility;
- * ruggedness;
- * ease of use;
- * durability;
- * sensitivity; and
- * relatively short response time.

ANSI N13.4(1971) sets forth various other parameters that should be considered with regard to Radiation Survey Instruments. That document is in Applicants' possession.

- c) Not applicable.
- d) Not applicable.

INTERROGATORY NO. 20 (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTION V).

a) Please state for each continuous air monitor and portable air monitor or portable air sampler to be used at Harris, and for each type of such monitor, exactly what frequency of inspection and calibration would suffice, in Applicants view, to assure their accuracy within plus or minus 5% at all times. If no such frequency of calibration and inspection exists, please so state.

b) What is the lowest range of error (plus or minus percent or plus and minus given amounts) which Applicants believe can be achieved for each type or each specific continuous air monitor or portable air monitor or portable air sampler to be used at Harris. Please identify the type of air monitor or portable air sampler and the manufacturer used in response to this question.

c) What error in sampling the concentration of air with a monitor located within 10 feet of a person working in a radiation area at Shearon Harris do Applicants believe would be introduced if the person were working closer to the radiation source than the monitor.

d) Please state the information requested in subpart c) above if the person is working farther from the radiation source than the monitor by a distance of 10 feet.

e) Please state exactly how radiation level in air varies with distance at Harris in each radiation working area if any specific relationship is known. If no such relationship is known, please state whether Carolina Power & Light has any policy as to the placement of the portable air monitors and portable air samplers for radiation with respect to the air flow in a working area. Please identify all documents which contain or explain such policy, state who made the policy, what their qualifications were to make the policy, whether the policy originated with Applicants, with the NRC, with some industry group, or in some other place. Please state further what the maximum margin of error such policy would allow with respect to the exposure or level of concentration of airborne radioactive material which would be experienced by a person working in the area as compared to that which would be detected by the portable air sampler. If no such range has been established for error, please so state.

ANSWER.

a) Applicants have no opinion as to the frequency of calibration that would assure accuracy within $\pm 5\%$. It is Applicants' position that calibration to within $\pm 5\%$ is not necessary to ensure compliance with the applicable regulations.

b) Instruments may be considered properly calibrated when the readings obtained are within $\pm 20\%$ of calculated or known values.

c) The concentration at various locations depends upon the length of time during which the release of radioactivity has taken place. If the release has been occurring for a sufficient time, the contaminant in the air will come to an equilibrium. The momentum associated with the leaking gas enhances dispersion and mixing in the air.

A small difference in concentrations would be observed where mixing has not yet occurred.

d) See Applicants' response to c) above.

e) The heating, ventilating, and air conditioning systems in nuclear power plants are designed to move air from potentially low airborne concentration areas to areas of potential high concentrations. Portable air monitors are used extensively in nuclear power plants. They are in use at the Brunswick Plant and at the Robinson Plant. There is no reason to expect that such devices will not be used extensively at the Harris Plant.

The general practice is to place the air sampler in the area where employees and contractors are working. Air samples

are collected to be representative of the air in the workers' breathing zone. However, when obtaining representative samples from the breathing zone is not practicable, the samples, when possible, are obtained from a location at which the radioactivity concentration in air is known to be greater than that of the workers' breathing zone. This procedure is in accord with the guidelines contained in NUREG-0472 (1978) and NUREG-0133 (1978).

If more representative breathing zone airborne concentrations are required, lapel air samplers may be worn. This information will be discussed in the operational health physics portion of the SHNPP operating procedures. These operating procedures are in the process of being written by persons qualified in nuclear power plant operational health physics.

INTERROGATORY NO. 21. (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTION V AND VI).

With respect to tritium, the FSAR section 12.5.2.1.7.3.4 reads in its entirety as follows: "Special air sampling. Water bubblers, dessicaant columns or cold traps are available for tritium air sampling and gas sample containers such as Marinelli containers are available for special gaseous sampling".

a) Do Applicants agree that this statement reports that section of the FSAR in full:

b) If the answer to subpart a) is other than affirmative, please state exactly what that section of the FSAR does state.

c) Please identify each such water bubbler, dessicaant column, cold traps, or gas sample container referred to above, and explain how it will be used at Harris to sample the tritium levels in air in areas where personnel are working.

d) Please state whether tritium is able to penetrate protective gear worn by personnel working in radiation areas.

e) Please state the permeability to tritium of each protective device or garment, particularly air masks, protective clothing, plastic boots, and any other protective equipment worn by persons working in Harris. State the rate of diffusion of tritium through each such material or each such item of protective equipment or protective clothing.

f) Please state the maximum concentration of tritium which can be expected to enter into the breathing apparatus of any employee temporary or otherwise, working in a radiation area at the Harris Plant.

g) Please state how long it takes to determine the concentration of tritium using each type of water bubbler, dessiccant column, cold trap, gas sample container and other procedure used for determining tritium air concentrations in work areas at Harris, and how often such determinations will be made when personnel are working in any radiation area at Harris in which tritium may be present in the atmosphere.

h) Please state if tritium in liquids or in water at Harris is monitored on any regular basis, and whether Applicants have taken any steps to measure the amount of tritium in the drinking water system at Harris on a regular basis in case radioactive materials are introduced into the drinking water system, particularly tritium. If such steps are taken, please describe them.

ANSWER/PARTIAL OBJECTION. With regard to Contention V, Applicants object to this interrogatory on the grounds that it is irrelevant to the contention as admitted and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above-stated objection, Applicants' response to Joint Intervenor's interrogatory is as follows:

a) Yes.

b) Not applicable.

c) This equipment cannot be identified at this time because it has not yet been purchased.

d) Tritium can penetrate some protective gear.

e) Although Applicants use protective equipment, they take no credit for protective equipment when calculating tritium exposure. Applicants do not possess, use, or transfer tritium. Therefore the uptake by the body from either inhalation or absorption, or both routes of intake, in any calendar quarter will be far less than the amount allowed in Appendix B, Table 1, Column 1 of 10 C.F.R. 20.

f) The dose levels discussed in Response 21(e) will never be exceeded. As the airborne concentration of tritium increases, the permitted exposure time will be decreased proportionately.

g) This information has not been determined for the SHNPP yet.

h) Tritium in liquids, ground water, and drinking water will be monitored on a regular basis as specified in NUREG-0472, page 3/4 12-4 and page 3/4 11-2, Table 4.11-1:

"Radiological Effluent Technical Specifications"

NUREG-0472, Revision 2.

INTERROGATORY NO. 22. (IDENTIFIED BY INTERVENORS AS RELEVANT TO CONTENTIONS IV, V AND VI)

a) Will Carolina Power & Light keep records of each assessment of individual exposure to airborne nuclides under 10 CFR 20.103a3, including those assessments which indicate that an individual's intake of radioactive material would result in less intake than would result from inhalation for 2 hours in any one day, or for 10 hours in any one week, or for both, of

the uniform concentration specified in Appendix B, Table 1, Column 1?

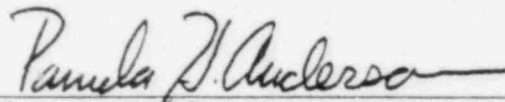
b) If the response to subpart a) is negative, will any radiation exposure, other than that inquired of above, not be recorded for any individual who may be exposed to radiation while working at the Shearon Harris Nuclear Power Plant?

c) If the answer to subpart b) is affirmative, please describe such exposure in detail, state how it will be excluded, identify the rules or regulations that permit it to be excluded, and indicate why Applicants believe that such exclusion is consistent with ALARA.

OBJECTION. Applicants object to this interrogatory on the grounds that it is irrelevant and not calculated to lead to the discovery of admissible evidence. Contentions IV, V and VI relate to Applicants' ability to measure radioactivity released in the air or an individual's external exposure to various sources of radiation. The contentions focus attention on the accuracy of Applicants' equipment; they do not question Applicants' ability properly to record the measurement made by the equipment.

Furthermore, as discussed in the Answer to Interrogatory No. 17, intake of radioactive material is not measured either by TLD's or by the air samplers and monitors that are referred to in Contention V and VI. Intake of radioactive material cannot be equated with external exposure.

Objections submitted by:



Thomas A. Baxter, P.C.
John H. O'Neill, Jr.
Pamela H. Anderson
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Richard E. Jones
Samantha Francis Flynn
H. Hill Carrow
CAROLINA POWER & LIGHT COMPANY
P.O. Box 1551
Raleigh, North Carolina 27602
Telephone: (919) 836-7707

Dated: August 1, 1983

To: P. Anderson

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))

AFFIDAVIT OF B. H. WEBSTER

County of Wake)
)
State of North Carolina)

B. H. Webster, being duly sworn, according to law, deposes and says that he is Manager - Radiological & Chemical Support Section of Carolina Power & Light Company; that the answers to Interrogatories on Contentions IV, V, and VI contained in "Applicant's Responses to Joint Intervenor's General Interrogatories and Interrogatories on Contentions IV, V, and VI to Applicants Carolina Power & Light Company, et al. (First Set)" are true and correct to the best of his information, knowledge and belief; and that the sources of his information are officers, employees, agents and contractors of Carolina Power & Light Company.

B. H. Webster
B. H. Webster

Sworn to and subscribed before
me this 29 day of July, 1983.

Betty J. Hicks
Notary Public

My commission expires 8/28/85



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Responses to Joint Intervenors' General Interrogatories and Interrogatories On Contentions IV, V, and VI To Applicants Carolina Power & Light Company, Et. Al. (First Set)" and "Certification of Counsel" were served this 1st day of August, 1983, by deposit in the U.S. mail, first class, postage prepaid, to the parties on the attached Service List.



Pamela H. Anderson

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

)
)
)
)
)
)
)

Dr. Linda Little
Governor's Waste Management Board
513 Albemarle Building
325 North Salisbury Street
Raleigh, North Carolina 27611

Service List
Page Two

Bradley W. Jones, Esquire
U.S. Nuclear Regulatory Commission
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101 Marrietta Street
Atlanta, Georgia 30303

Ruthanne G. Miller, Esquire
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Karen E. Long, Esquire
Public Staff - NCUC
Post Office Box 991
Raleigh, North Carolina 27602

August 1, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

CERTIFICATION BY COUNSEL

I, Pamela H. Anderson, Counsel for Applicants in the above-captioned proceeding, certify that I have made the following efforts to resolve Applicants' objections to certain of "Joint Intervenors' Interrogatories To Applicants On Contentions IV, V, and VI (First Set)" dated June 27, 1983:

1. After receiving Joint Intervenors' Interrogatories To Applicants On Contentions III, IV and V (sic), I spoke by telephone to Travis Payne, counsel for the Joint Intervenors. At that time John H. O'Neill, Jr., also an attorney for Applicants, and I informed Mr. Payne that we could not understand which interrogatories were propounded in reference to each of the three Joint Contentions on monitoring of radioactivity. Mr. Payne stated that he felt that each of the interrogatories clearly was applicable to one or more contention. Mr. O'Neill and I stated our position that intervenors

were required to propound specific interrogatories for specific contentions. We informed Mr. Payne that we did not believe that some of the interrogatories were relevant to any contention, but that, due to the faulty numbering system, it was impossible for us to assess the relevance of each interrogatory. Mr. Payne agreed to renumber the interrogatories and indicate which interrogatories were applicable to each contention.

2. On July 29, 1983 I attempted to speak with Mr. Payne by telephone in order to discuss the Applicants' objections to various interrogatories propounded by Joint Intervenors. Mr. Payne did not return my call.

3. On August 1, 1983 I again attempted to telephone Mr. Payne. Mr. Payne's secretary took a message and stated that Mr. Payne would return the call that same afternoon. When Mr. Payne did not return my call, I served the responses and objections on the persons on the service lists attached hereto, in accord with Applicants' agreement with Mr. Payne that responses be served by August 1, 1983.

Pamela H. Anderson

Pamela H. Anderson

DISTRICT OF COLUMBIA:

Dated:

Aug. 1, 1983

Subscribed and sworn to before me
this *1st* day of August, 1983.

Glenn E. McConnell
Notary Public

My Commission expires:

June 30, 1987