March 21, 1983

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)	)	

APPLICANTS' INTERROGATORIES AND
REQUEST FOR PRODUCTION OF DOCUMENTS
TO INTERVENOR RICHARD D. WILSON (THIRD SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Intervenor Richard D. Wilson answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the

responses to interrogatories below. Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14 days after service of the interrogatories; responses or objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should you or any individual acting on your behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and you must produce immediately any additional documents you, or any individual acting on your behalf, obtain which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which you rely.

Definitions: As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Company, North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of Richard D. Wilson or any individual acting on his behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of Mr. Wilson; a document shall be deemed to be within the "control" of Mr. Wilson or any individual acting on his behalf if he has ownership, possession or custody of the document or copy thereof, or has the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

General Interrogatories

1(a). State the name, present or last known address, and present or last known employer of each person known to you to have first-hand knowledge of the facts alleged, and upon which you relied in formulating allegations in the contention which is the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in the contention which you contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which you relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and education and professional qualifications of each person you intend to call as an expert witness or a witness relating to the contention which is the subject of this set of interrogatories.

(b). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in your possession, custody or control, including all relevant page citations, pertaining to the subject matter of, and upon which you relied in formulating allegations in the contention which is the subject of this set of interrogatories.

(b). Identify the contention to which each such document relates.

(c). State the specific allegation in each contention which you contend each document supports.

5(a). Identify all documents in your possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which you intend to offer as exhibits during this proceeding to support the contention which is the subject of this set of interrogatories or which you intend to use during cross-examination of witnesses presented

by Applicants and/or the NRC Staff on the contention which is the subject of this set of interrogatories.

(b). Identify the particular page citations of each document applicable to the contention.

Interrogatories on Wilson IVC

(Radiological Monitoring)

IVC-1. The deriviation of the formula

$$L.L.D. = \frac{4.66Sb}{E \times V \times 2.2 \times Y \times e^{-\lambda\Delta t}}$$

is described in Applicants' Environmental Report at Table 6.1.5-9 and at Table 4.12-1 of the most recent draft of NUREG-0472, dated January 4, 1983, attached hereto. In light of this explanation, do you now understand that Sb will not vary with conditions of season, time or weather? If so, will you withdraw Part 1 of Contention IVC?

If the answer to Interrogatory IVC-1 is other than affirmative:

IVC-2. Explain in detail why you believe that "Sb" will vary with the seasons of the year;

IVC-3. Describe in detail how you expect "Sb" to vary at different seasons and state the magnitude of variance that you expect to occur in measurements obtained from Applicants' equipment;

IVC-4. Explain in detail why you believe that "Sb" will vary at different times of day;

IVC-5. Describe in detail how you expect "Sb" to vary at different times of day and state the magnitude of variance that you expect to occur in measurements obtained from Applicants' equipment;

IVC-6. Explain in detail why you believe that "Sb" will vary with different weather conditions;

IVC-7. Describe in detail how you expect "Sb" to vary with different weather conditions and state the magnitude of variance that you expect to occur in measurements obtained from Applicants' equipment.

IVC-8. Applicants intend to be bound by the reporting requirements set out at § 3.12.1 of the January 4, 1983 draft of NUREG-0472, attached hereto, which require a licensee to report measurements in excess of the levels specified in Table 3.12-2 of NUREG-0472. Will you withdraw part 2 of Contention IVC if Applicants comply with the above-cited specifications?

IVC-9. If the answer to Interrogatory IVC-8 is other than affirmative, explain why you believe that the methodology and reporting requirements set forth in the above-cited materials are inadequate to ensure compliance with the requirements of 10 C.F.R. § 50, Appendix I.

IVC-10. The use of split sample technique is explained in Applicants' Environmental Report at § 6.1.5.5. Explain in detail your definition of the term "split sample" as it is used in part 3 of Contention IVC.

IVC-11. In proposing Contention IVC, were you aware that Applicants conduct split sample analyses using a test sample of known activity only as a technique for evaluating the performance of equipment and counting techniques?

IVC-12. If the answer to Interrogatory IVC-11 is other than affirmative, will you withdraw Part 3 of Contention IVC?

IVC-13. Regulatory Guide 4.15, pages 4.15-6 and 4.15-7 of which are attached hereto, explains the purpose of split sample analysis and states that where the "mean result of cross-check analysis exceeds the control limit . . . an investigation should be made to determine the reason for this deviation and corrective action should be taken as necessary." Reg. Guide at 4.15-6. Thus Applicants are required to resolve the problem, whether caused by human error or equipment malfunction. Does this procedure satisfy your concern with regard to part 3 of Contention IVC? If so, will you withdraw Part 3 of Contention IVC?

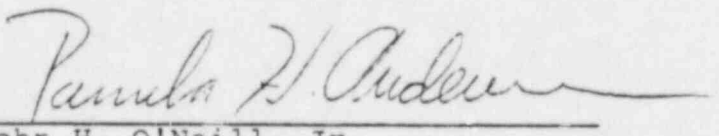
IVC-14. If the answer to Interrogatory IVC-13 is other than affirmative, explain what you believe to be an appropriate procedure for resolution of discrepancies during split sample analyses.

Request for Production of Documents

Applicants request that Richard D. Wilson respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified

or described in the answers to each of the above interrogatories at a place mutually convenient to the parties.

Respectfully submitted,



John H. O'Neill, Jr.
Pamela H. Anderson
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: March 21, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'83 MAR 22 P3:20

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' Interrogatories And Request For Production Of Documents To Intervenor Richard D. Wilson (Third Set)" were served this 21st day of March, 1983, by deposit in the U.S. mail, first class, postage prepaid, to the parties on the attached Service List.

Pamela H. Anderson

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)	)	

SERVICE LIST

James L. Kelley, Esquire
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Glenn O. Bright
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. James H. Carpenter
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Charles A. Barth, Esquire
Myron Karman, Esquire
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Daniel F. Read, President
Chapel Hill Anti-Nuclear Group Effort
P.O. Box 524
Chapel Hill, North Carolina 27514

John D. Runkle, Esquire
Conservation Council of North Carolina
307 Granville Road
Chapel Hill, North Carolina 27514

M. Travis Payne, Esquire
Edelstein and Payne
P.O. Box 12643
Raleigh, North Carolina 27605

Dr. Richard D. Wilson
729 Hunter Street
Apex, North Carolina 27502

Mr. Wells Eddleman
718-A Iredell Street
Durham, North Carolina 27705

Ms. Patricia T. Newman
Mr. Slater E. Newman
Citizens Against Nuclear Power
2309 Weymouth Court
Raleigh, North Carolina 27612

Richard E. Jones, Esquire
Vice President & Senior Counsel
Carolina Power & Light Company
P.O. Box 1551
Raleigh, North Carolina 27602

Dr. Phyllis Lotchin
108 Bridle Run
Chapel Hill, North Carolina 27514

Deborah Greenblatt, Esquire
1634 Crest Road
Raleigh, North Carolina 27606

Bradley W. Jones, Esquire
U.S. Nuclear Regulatory Commission
Region II
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

TABLE 4.12-1 (Continued)

TABLE NOTATION

a - The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66\ s_b}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

where

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)

E is the counting efficiency (as counts per transformation)

V is the sample size (in units of mass or volume)

2.22 is the number of transformation per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

Δt is the elapsed time between sample collection (or end of the sample collection period) and time of counting

The value of s_b used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples).

TABLE NOTATION

Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interferring nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors will be identified and described in the Annual Radiological Environmental Operating Report.

b - LLD for drinking water.

c - LLD for leafy vegetables.

3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.1 MONITORING PROGRAM

LIMITING CONDITION FOR OPERATION

3.12.1 The radiological environmental monitoring program shall be conducted as specified in Table 3.12-1.

APPLICABILITY: At all times.

ACTION:

a. With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, in lieu of a Licensee Event Report, prepare and submit to the Commission, in the Annual Radiological Environmental Operating Report required by Specification 6.9.1.11, a description of the reasons for not conducting the program as required and the plans for preventing a recurrence.

b. With the level of radioactivity as the result of plant effluents in an environmental sampling medium at a specified location exceeding the reporting levels of Table 3.12-2 when averaged over any calendar quarter, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce radioactive effluents so that the potential annual dose* to A MEMBER OF THE PUBLIC is less than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2, and 3.11.2.3. When more than one of the radionuclides in Table 3.12-2 are detected in the sampling medium, this report shall be submitted if:

$$\frac{\text{concentration (1)}}{\text{reporting level (1)}} + \frac{\text{concentration (2)}}{\text{reporting level (2)}} + \ldots \geq 1.0$$

When radionuclides other than those in Table 3.12-2 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose* to A MEMBER OF THE PUBLIC is equal to or greater than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2 and 3.11.2.3. This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event, the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

c. With milk or fresh leafy vegetable samples unavailable from one or more of the sample locations required by Table 3.12-1, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The specific

*The methodology and parameters used to estimate the potential annual dose to a MEMBER OF THE PUBLIC shall be indicated in this report.

TABLE 3.12-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Analysis	Water (pCi/ℓ)	Airborne Particulate or Gases (pCi/m³)	Fish (pCi/kg, wet)	Milk (pCi/ℓ)	Food Products (pCi/kg, wet)
	Reporting Levels				
H-3	20,000*				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
I-131	2	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

*For drinking water samples. This is 40 CFR Part 141 value. If no drinking water pathway exists, a value of 30,000 pCi/ℓ may be used.

samples containing known concentrations of radionuclides provides a means to determine accuracy. The analysis of laboratory blanks provides a means to detect and measure radioactive contamination of analytical samples, a common source of error in radiochemical analysis of low-level samples. The analysis of analytical blanks also provides information on the adequacy of background subtraction, particularly for environmental samples.

The fraction of the analytical effort needed for the analysis of quality control samples depends to a large extent on (1) the mixture of sample types in a particular laboratory in a particular time period and (2) the history of performance of that laboratory in the analysis of quality control samples. However, for environmental laboratories, it is found that at least 5%, and typically 10%, of the analytical load should consist of quality control samples.

6.3.1 Intralaboratory Analyses

Replicate samples, usually duplicates, should be analyzed routinely. These replicates should be prepared from samples that are as homogeneous as possible, such as well-stirred or mixed liquids (water or milk) and solids (dried, ground, or screened soil, sediment, or vegetation; or the ash of these materials). These samples may be replicates of monitoring program samples, replicates of reference test materials, or both. The size and other physical and chemical characteristics of the replicate samples should be similar to those of single samples analyzed routinely.

The analysis of the replicate samples as blind replicates is desirable but is not practicable for all laboratories or for all types of samples. For example, in small laboratories it may not be practicable to prevent the analysts from being aware that particular samples are replicates of one another.

Obtaining true replicates of all types of samples also is not practicable. For example, obtaining replicate samples of airborne materials usually is not practicable on a routine basis because it requires either a separate sampling system or splitting a single sample (e.g., cutting a filter in half). Use of replicate samplers usually is not economically feasible and splitting of samples results in replicates that do not represent the usual sample size or measurement configuration (counting geometry) for direct measurement. However, simulated samples of airborne materials may be prepared in replicate and submitted for analysis as unknowns.

Analysis of intralaboratory blank and spiked samples is an important part of each environmental laboratory's quality control program. To check for contamination from reagents and other sources, known analytical blank samples should be included frequently in groups of unknown environmental samples that are analyzed radiochemically. Spiked and blank samples should be submitted for analysis as unknowns to provide an intralaboratory basis for estimating the accuracy of the analytical results. These blanks and spikes may include blind replicates.

6.3.2 Interlaboratory Analyses

Analysis of effluent and environmental samples split with one or more independent laboratories is an important part of the quality assurance program because it provides a means to detect errors that might not be detected by intralaboratory measurements alone. When possible, these independent laboratories should be those whose measurements are traceable to NBS.[3]

Analysis of split field samples, such as samples of milk, water, soil or sediment, and vegetation is particularly important in environmental monitoring programs to provide an independent test of the ability to measure radionuclides at the very low concentrations present in most environmental samples.

The NRC Office of Inspection and Enforcement conducts a Confirmatory Measurements Program for laboratories of licensees that measure nuclear reactor effluents. The analyses of liquid waste holdup tank samples, gas samples, charcoal cartridges, and stack particulate filters are included in this program. The results of the licensee's measurements of samples split with the NRC are compared to those of an NRC reference laboratory whose measurements are traceable to the National Bureau of Standards. Thus the results of this comparison provide to the NRC an objective measure of the accuracy of the licensee's analyses.

Laboratories of licensees or their contractors that perform environmental measurements should participate in the EPA's Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program, or an equivalent program. This participation should include all of the determinations (sample medium/radionuclide combinations) that are both offered by EPA and included in the licensee's environmental monitoring program. Participation in the EPA program provides an objective measure of the accuracy of the analyses because the EPA measurements are traceable to the National Bureau of Standards. If the mean result of a cross-check analysis exceeds the control limit as defined by EPA (Ref. 42), an investigation should be made to determine the reason for this deviation and corrective action should be taken

[3] NBS and NRC staffs recognize the need for a clearer definition of the term "traceability" as it applies to radiation and radioactivity measurements. These staffs are working together to develop such a statement, which will be published separately.

as necessary. Similarly, an investigation and any necessary corrective action should take place if the "normalized range," as calculated by EPA, exceeds the control limit, as defined by EPA. A series of results that is within the control limits but that exhibits a trend toward these limits may indicate a need for an investigation to determine the reason for the trend.

6.4 Computational Checks

Procedures for the computation of the concentration of radioactive materials should include the independent verification of a substantial fraction of the results of the computation by a person other than the one performing the original computation. For computer calculations, the input data should be verified by a knowledgeable individual. All computer programs should be documented and verified before initial routine use and after each modification of the program. The verification process should include verification, by a knowledgeable individual, of the algorithm used and test runs in which the output of the computer computation for given input can be compared to "true" values that are known or determined independently of the computer calculation. Documentation of the program should include a description of the algorithm and, if possible, a current listing of the program. Guidelines for the documentation of digital computer programs are given in ANSI N413-1974 (Ref. 43).

7. Quality Control for Continuous Effluent Monitoring Systems

Guidance on specification and performance of onsite instrumentation for continuously monitoring radioactivity in effluents is given in ANSI N13.10-1974 (Ref. 18).

The specified frequency of calibration for a particular system should be based on considerations of the nature and stability of that system. For nuclear power plants, specific requirements for calibrations and checks of particular effluent monitoring systems usually are included in the technical specifications for the plant.

Initial calibration of each measuring system should be performed using one or more of the reference standards that are certified by the National Bureau of Standards or standards that have been obtained from suppliers that participate in measurement assurance activities with NBS (see footnote 2). These radionuclide standards should permit calibrating the system over its intended range of energy and rate capabilities. For nuclear power plants, sources that have been related to this initial calibration should be used to check this initial calibration at least once per 18 months (normally during refueling outages).

Periodic correlations should be made during operation to relate monitor readings to the concentrations and/or release rates of radioactive material in the monitored release path. These correlations should be based on the results of analyses for specific radionuclides in grab samples from the release path.

Any flow-rate measuring devices associated with the system should be calibrated to determine actual flow rates at the conditions of temperature and pressure under which the system will be operated. These flow rate devices should be recalibrated periodically.

Whenever practicable, a check source that is actuated remotely should be installed for integrity checks of the detector and the associated electrical system.

8. Review and Analysis of Data

Procedures for review and analysis of data should be developed. These procedures should cover examination of data from actual samples and from quality-control activities for reasonableness and consistency. These reviews should be performed on a timely basis. General criteria for recognizing deficiencies in data should be established.

Provisions should be made for investigation and correction of recognized deficiencies and for documentation of these actions.

9. Audits

Planned and periodic audits should be made to verify implementation of the quality assurance program. The audits should be performed by individuals qualified in radiochemistry and monitoring techniques who do not have direct responsibilities in the areas being audited.

Audit results should be documented and reviewed by management having responsibility in the area audited. Followup action, including reaudit of deficient areas, should be taken where indicated.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide.

Except in those cases in which the applicant or licensee proposes an acceptable alternative method, the staff will use the methods described herein in evaluating an applicant's or licensee's capability for and performance in complying with specified portions of the Commission's regulations after March 30, 1979.

If an applicant or licensee wishes to use the method described in this regulatory guide on or before March 30, 1979, the pertinent portions of the application or the licensee's performance will be evaluated on the basis of this guide.