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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
CAROLINA POWER & LIGHT COMPANY )  
AND NORTH CAROLINA EASTERN ) Docket No. 50-400 OL  
MUNICIPAL POWER AGENCY )  
 )  
(Shearon Harris Nuclear Power Plant) )

AFFIDAVIT OF DAYNE H. BROWN IN SUPPORT OF  
APPLICANTS' MOTION FOR SUMMARY DISPOSITION  
OF CCNC CONTENTION 8

County of Wake )  
 ) SS:  
State of North Carolina )

Dayne H. Brown, being duly sworn, deposes and says:

1. My name is Dayne H. Brown. I am employed as Chief of the Radiation Protection Section (RPS), Division of Facilities Services, North Carolina Department of Human Resources. My business address is Post Office Box 12200, Raleigh, North Carolina 27605. I have served in my present position as Chief of RPS since June 1967. I received a Bachelor of Science degree (with honors) in Physics in 1962 from North Carolina State University. In 1964, I also received a Master of Science degree in Physics from N. C. State. A copy of my Curriculum Vitae, which contains additional information about my education and professional background, is attached to this Affidavit as Attachment A.

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2. I have reviewed Contention 8 submitted by the Conservation Council of North Carolina (CCNC) and am aware that it alleges that RPS does not have adequate staff and does not have adequately trained staff to meet the requirements of the Nuclear Regulatory Commission's emergency planning rule with respect to the capabilities of organizations that may be required to provide assistance during an emergency situation at the Shearon Harris Nuclear Power Plant.

3. As Chief of RPS, I would have overall responsibility for coordinating RPS's activities in the event of an accident at the Harris Plant. I am confident that RPS will have an adequate number of staff members and that the staff will be adequately trained to perform its responsibilities in an accident situation.

4. In the event of an accident at the Harris Plant, RPS would be called on to provide personnel for a number of emergency response functions. The following is a listing of the approximate number of persons needed to perform RPS functions and the areas in which such persons would provide assistance:

<u>Area of Assistance</u>	<u>Number of Personnel</u>
State Emergency Response Team/ State Emergency Operations Center	8
Emergency Operations Facility	2
RPS Mobile Laboratory	4-5
RPS Office	6
Radiation Survey Teams	4
<u>Total</u>	<u>24-25</u>

All these positions need not be filled in order to activate RPS's emergency response. Less critical positions will be filled as additional personnel become available.

5. At the State Emergency Response Team/State Emergency Operations Center (SERT/SEOC), RPS would be responsible for filling the following eight positions: Senior RPS Chief, Assistant RPS Chief, Exposure Analyst, Power Plant Liaison, Communicator (Radio), Communicator (Telephone), secretary and a staff support position. The Senior

RPS Chief would fulfill a number of important functions, including evaluating data and recommended actions submitted by the power company and RPS, and advising the SERT Director on protective actions. Among the duties of the Assistant RPS Chief are managing the RPS SERT office, directing the RPS Field Leader and assuming responsibilities of the Senior RPS Chief in his absence. The two positions to be maintained at the Emergency Operations Facility (EOF) are Liaison-Utility EOF and Coordinator-Utility EOF. The RPS Mobile Laboratory will be manned during an emergency by a Field Leader, Alternate Field Leader, Communicator, Laboratory Equipment Operator and possibly one staff support person. There will be three two-person radiation survey teams activated. In addition to four RPS personnel, these teams will include two volunteers from the Team of Radiological Emergency Volunteers (TOREV) which is described in paragraph 9 below. Those six personnel who will remain at the RPS office are the Dose Assessment Leader, Dose Assessment Assistant, computer operator, liaison-adjacent states, thermoluminescent dosimeter (TLD) dosimetrist, and a secretary. Within each area in which RPS assistance is involved, specific responsibilities will be assigned on an ad hoc basis, taking into account the background and experience of the RPS personnel. Most such responsibilities would require personnel with health physics training, but at least four positions (the communicator (telephone) and secretary at the SERT/EOF, and the liaison—adjacent states and secretary at the RPS office) could be filled by members of the RPS clerical staff.

6. To fulfill these functions, RPS will rely upon its own staff and on additional personnel from the North Carolina Division of Emergency Management. Backup support will be available from a number of other organizations, as described in paragraph 9 below. RPS currently has a staff that includes seventeen professional personnel. These personnel are listed by title and years of experience with RPS in Attachment B to this Affidavit. There are two professional positions (the Deputy Section Chief and an

Environmental Engineering Technician III) which are currently vacant. We expect to fill both positions before the Harris Plant begins commercial operation. In addition, 3 or 4 RPS clerical employees would be available to provide clerical support during an emergency at the Harris Plant.

7. RPS has recently added an emergency response planner to the staff. He is responsible on a full-time basis for the development, implementation and maintenance of RPS's emergency response preparedness and plans in support of nuclear facilities such as the Harris Plant. Among his duties are developing standard operating procedures for use during a radiological emergency; developing, coordinating and implementing training for RPS staff and volunteers; coordinating with the North Carolina Division of Emergency Management (DEM), utilities and others; and helping to organize required plan exercises. As a trained health physicist who is involved exclusively in these activities, the emergency response planner has added greatly to RPS's capabilities in preparing for a nuclear emergency.

8. In order to augment RPS's permanent staff to fill all the positions listed in paragraph 4 above, the North Carolina Division of Emergency Management will provide five additional persons from its staff during a radiological emergency. These additional personnel include (1) DEM's Chief of Educational/Radiological Branch; (2) a Radiological Planning Officer who is experienced in radiation survey training and application; (3) DEM's Radiation Safety Officer who has 18 years' experience in the use, calibration and maintenance of radiation equipment; (4) an electronic technician with 16 years' experience in the use, calibration and maintenance of radiation monitoring equipment; and (5) one secretary with a working background in radiological terminology. Jointly, there would be 27 or 28 RPS personnel (professional and clerical) and DEM personnel to fill the 24 or 25 positions identified in paragraph 5 above.

9. If additional personnel are needed, RPS has access to such personnel from several sources. Approximately 30 additional personnel are available through TOREV organized by the North Carolina Chapter of the Health Physics Society. These individuals are trained and experienced in health physics practices, and a number have participated in emergency response exercises at nuclear power plants in North Carolina. TOREV membership includes health physicists from utilities (Carolina Power & Light Company and Duke Power Company), hospitals (Duke University Medical Center, Baptist Hospital and others), universities and private industries. Most volunteers have advanced degrees and extensive experience in the field of health physics. In order to maintain 24-hour-per-day staffing, TOREV volunteers can replace RPS personnel in many of the positions identified above. RPS will maintain staffing of the supervisory positions on all shifts. Additional qualified personnel can be obtained from within the State of North Carolina and from other states by means of the Southern Mutual Radiological Assistance Plan (SMRAP). The governments of fourteen states (North Carolina, South Carolina, Alabama, Georgia, Florida, Kentucky, Mississippi, Tennessee, Arkansas, Missouri, Louisiana, Texas, Oklahoma, and West Virginia) are represented on the Southern Emergency Response Council which developed the plan. The governors of each of the signatory states have signed an agreement whereby each state is responsible for providing resources for coping with any radiation emergency that is outside the capability of the state requesting assistance. Each signatory state maintains an emergency team ready to respond to a radiation accident at any time. The teams consist of qualified and experienced health physics personnel equipped with appropriate radiation detection instrumentation and equipment. Personnel from these sources can be used to supplement RPS on a long-term basis. Finally, it should be emphasized that federal agencies (including the NRC and FEMA) will also provide substantial support on a long-term basis.

10. RPS personnel will be available on an as-needed basis during the first 24 hours after an accident at the Harris Plant. RPS will assure that all important functions are performed with its personnel. Personnel from DEM and local TOREV volunteers will be available during this time period to relieve the RPS staff from some of the responsibilities identified in paragraph 4 above. Sufficient support will be available to permit a shift rotation in most positions. In addition, RPS will have enough staff positions filled during the first 24 hours so that all persons can take breaks or sleep while other staff members provide backup support. After this 24-hour period, RPS expects to augment its staff with personnel from other groups, as described in Paragraph 9 above.

11. Within the past five years, RPS has participated in six emergency response exercises at nuclear power plant sites. Three of these exercises have been at Applicants' Brunswick Plant, two have been at Duke Power Company's McGuire Plant, and one has been at Duke's Catawba Plant. Attachment C to this Affidavit is a listing of the duties that were performed by various RPS personnel during these exercises. Each grouping represents the duties performed by one person. As can be seen from Attachment C, RPS personnel have gained experience in a variety of positions related to emergency preparedness in support of nuclear power plants. This has resulted in progressive expansion of the RPS nuclear emergency response capability and performance, including direct expansion of RPS staff training and experience; increased versatility of staff to perform multiple RPS emergency response functions; improved RPS emergency response organizational structure and operational procedures; and acquisition and use of equipment needed to support the RPS emergency response functions. The functions performed by RPS have recently been evaluated favorably by FEMA. The most recent exercise was at the Catawba Plant in February 1984. In its Exercise Report, FEMA concluded that no deficiencies by the State of North Carolina in compliance with NUREG-0654 criteria were observed. With respect to RPS functions, FEMA concluded

that "[r]adiological health personnel are well-trained and professional;" that RPS has "health physics and reactor technology expertise and experience to properly evaluate nuclear accidents and recommend optimum protective actions;" that the "accident assessment function was performed in a highly professional and efficient manner;" that "the Mobile Radiological Laboratory staff appeared to be well trained and capable;" and that "communications and monitoring equipment was adequate to good" for the field monitoring teams. Catawba Nuclear Station Exercise Report, dated March 5, 1984, at pp. 1, 11, 16.

12. Members of the RPS staff have already received considerable training related to the functions that they will perform in the event of an accident at the Harris Plant. RPS personnel have attended numerous training courses, workshops and seminars, some of which are specifically intended to enhance RPS's nuclear emergency response capability and others of which provide more general training in the health physics and radiation protection areas, applicable in a nuclear power plant emergency in that they increase overall RPS staff expertise. A summary of this training is included in Attachment D of this Affidavit. This training is supplemented by periodic in-house training sessions among RPS personnel. Those RPS personnel who will be expected to operate survey instruments during a radiation emergency have been trained in the use of those instruments and most use those instruments in their day-to-day work. In addition, eleven RPS personnel have just completed an emergency plan overview course offered by Carolina Power & Light Company (CP&L). This course is offered to CP&L's own employees and to others specifically to familiarize them with the emergency plans for the Harris Plant.

13. Prior to the time that the Harris Plant commences commercial operation, RPS personnel will receive additional training specifically oriented toward emergency response for the Harris Plant. CP&L has agreed to provide such training (both in the

classroom and in the field) in the areas deemed necessary by RPS to increase its emergency response capabilities. The general subject areas to be included in this training are identified in Attachment E to this Affidavit. RPS will request that certain designated personnel attend internal CP&L training courses that cover these subject areas. CP&L has also agreed to provide direct assistance to the RPS in its development of needed internal training programs for its staff and other personnel who assist RPS in the performance of RPS emergency response functions. This assistance will include provision of training materials, consultation and speakers on plant-specific topics.

14. On the basis of my estimate of the number of RPS personnel that will be required to respond to an accident at the Harris Plant, the availability of additional support and the training that RPS personnel have undergone or will undergo, I have no doubt that RPS will be able to meet its responsibilities if an accident should occur.

Dayne H. Brown  
DAYNE H. BROWN



Subscribed and sworn to before me  
this 7<sup>th</sup> day of December 1984.

Edna B. Williams  
Notary Public

My Commission Expires: June 7, 1988



CURRICULUM VITAE  
for  
Dayne H. Brown

Born August 18, 1940 in Shelby, North Carolina

Graduated from Needham B. Broughton High School, Raleigh, North Carolina  
June 1958

Graduated with honors from North Carolina State University with Bachelor  
of Science degree in Physics, June 1962

Awarded US Public Health Service Radiological Health and Safety Fellowship  
to attend North Carolina State University. Graduated from North Carolina  
State University, January 1964, Master of Science degree in Physics

Employed as a health physicist by the National Aeronautics and Space  
Administration, Lewis Research Center, Cleveland, Ohio from January 1964  
to February 1966

Employed as an instructor in the Radiological Health Training Program of  
US Public Health Services, Cincinnati, Ohio from February 1966 to June 1967

June 1967 to present: Employed as Chief of the Radiation Protection Section,  
Division of Facility Services, North Carolina Department of Human Resources

1976 to present: Ex officio member of the North Carolina Radiation Protection  
Commission

Member of:

NC Chapter of the Health Physics Society  
National Health Physics Society  
American Public Health Association  
Conference of Radiation Control Program Directors

## Radiation Protection Section Personnel

<u>Position</u>	<u>Number of Personnel</u>	<u>Total Man-Years Experience With RPS</u>
Chief of Section	1	15
Health Physicist II	1	22
Health Physicist I	3	4
Radiation Equipment Specialist II	1	15
Radiation Equipment Specialist I	7	49
Environmental Engineer II	1	13
Environmental Engineer I	1	*
Environmental Engineering Technician III	1	*
Emergency Response Planner	1	*

Total: 17 professional personnel

\*Less than one year

DUTIES PERFORMED BY RPS PERSONNEL  
AT NUCLEAR POWER PLANT EXERCISES\*

1. Dose Projection (Raleigh Office)  
Environmental Sampling (RPS) (EOC)  
Sampling Designer
2. TLD Coordinator (Personnel & Environmental)  
EOC Dose Projection (RPS)  
EOC Dose Projection & Technical Support (RPS)
3. Senior Representative at SERT  
Representative at Utility EOF  
Controller
4. Secretary
5. Radiation Monitoring Team Member  
Communications EOC (RPS)
6. Clerical Duties-SERT  
Dose Projections Assistant (Raleigh Office)
7. Clerical Duties-SERT  
Clerical Duties (Raleigh Office)
8. Liaison Officer-Utility  
Controller (SERT)  
Planner for Emergency Management (Controller)  
Participant (SERT)
9. TLD Operations  
Field Survey Team
10. Field Survey Team  
Communications (SERT)  
Support EOC (RPS)
11. Mobile Lab Support
12. Communications Mobile Lab  
Data Management SERT

13. Secretary (Raleigh Office)  
Message Recorder (SERT)
14. Field Survey Team  
Power Plant Liaison  
Dose Projection Assistant  
Communications Mobile Lab
15. Field Team Leader  
Field Survey Team, RPS  
EOC Representative
16. Senior Representative at SERT, Team Leader at SERT  
Power Plant Liaison at EOC, Representative at EOC (SERT)

\*Each grouping of duties represents the duties performed by one RPS staff member at one or more nuclear power plant emergency exercises.

## RADIATION PROTECTION SECTION TRAINING

I. Emergency Response Training

<u>Course Description</u>	<u>Number of Staff Members Attending</u>
Radiological Emergency Response Team Training (FEMA)	9
Radiological Accident Assessment	3
Radiological Emergency Preparedness Planning	2
Emergency Response Environmental Monitoring Dose Projections	5 7
Radiation Accident and Emergency Procedures	1
Emergency Response Training for Government Agencies	2
Radiological Emergency Preparedness	1
Management of Radiation Accidents	1
Power Plant Principles	2
Reactor Theory, Operation and Emergency Planning	2
Radiation Accident Safety and Emergency Procedures	1

II. Health Physics and Radiation Protection Training

<u>Course Description</u>	<u>Number of Staff Members Attending</u>
Radioisotope Techniques	3
Radioisotope Short Course	1
Basic Radiological Health	4
Operational Radiation Safety	2
Health Physics and Radiation Safety	1
Occupational and Environmental Radiation Protection	1
Safety Aspects of Industrial Radiation	6
Hazardous Material Training	1
Medical Use of Radionuclides	2
Use of Nuclear Testing Equipment	2
Therapeutic Aspects of Ionizing Radiation	2
Advanced Medical X-Ray Protection	1
Teletherapy Inspection	1
Physics of Clinical Nuclear Medicine	1
Heart Catheterization Procedures (Radiation Protection)	1
Cobalt 60 Teletherapy Unit Calibration	1
Advanced X-Ray Surveys	1

GENERAL SUBJECT AREAS OF ADDITIONAL TRAINING OF RPS  
PERSONNEL TO BE PROVIDED BY CP&L

1. PWR Power Plant Systems and Operations
2. Health Physics
  - A. Dose Projection
  - B. Environmental Surveying and Sampling
  - C. Decontamination
  - D. Personnel Protection
  - E. Tabletop Exercises for the Above
3. Emergency Preparedness
  - A. Emergency Plan Overview
  - B. Accident Assessment
  - C. Emergency Response Tabletop Exercise
4. Offsite Hospital, Ambulance and Rescue Training
5. Power Plant Emergency Condition Evaluation
  - A. Accident Analysis
  - B. Equipment Failure Analysis
  - C. Analytical Troubleshooting
  - D. Safety Systems
  - E. Containment Systems
6. Core Damage and Transient Training
  - A. Source Term & Dose Calculations
  - B. Offsite Protective Action Guides & Recommendations
  - C. Core Damage Mitigation
  - D. Emergency Action Levels for Plant
7. Plant Specific Characteristics
  - A. Harris Plant Specific Characteristics
  - B. Specialized Emergency Response Training for Harris
8. Various Training Courses as Needed on a Case-by-Case Basis