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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

OFFICE OF SECRETARY  
ADMINISTRATIVE & SERVICE  
BRANCH

In the Matter of )  
 )  
CAROLINA POWER & LIGHT COMPANY )  
and NORTH CAROLINA EASTERN )  
MUNICIPAL POWER AGENCY )  
 )  
(Shearon Harris Nuclear Power )  
Plant) )

Docket No. 50-400 OL

APPLICANTS' TESTIMONY OF RICHARD M. EUCCI,  
EDWIN J. PAGAN AND PETER M. YANDOW  
IN RESPONSE TO EDDLEMAN CONTENTION 9F  
(LUBRICANTS AND SEALS)

Q.1 Please state your names.

A.1 Richard M. Bucci, Edwin J. Pagan and Peter M. Yandow.

Q.2 Mr. Bucci and Mr. Pagan, are your addresses, occupations, employers, educational backgrounds and professional work experiences described elsewhere in the record of this proceeding?

A.2 (RMB, EJP) Yes, the relevant information is provided in "Applicants' Testimony of Richard M. Bucci and Edwin J. Pagan in Response to Eddleman Contention 9D (Instrument Cables)."

Q.3 Mr. Yandow, are your address, occupation, employer, educational background and professional work experience described elsewhere in the record of this proceeding?

A.3 (PMY) Yes, the relevant information is provided in "Applicants' Testimony of Robert W. Prunty and Peter M. Yandow in Response to Eddleman Contention 9 (Environmental Qualification of Electrical Equipment)."

Q.4 What is the purpose of this testimony?

A.4 (RMB, EJP, PMY) The purpose of this testimony is to respond to Eddleman Contention 9F, which states:

The effects of radiation on lubricants and seals have not been adequately addressed in the environmental qualification program.

Q.5 How is your testimony organized?

A.5 (RMB, EJP, PMY) First, we provide background information on lubricants and seals used in safety-related

electrical equipment for the SHNPP. Second, we discuss how Ebasco assures that the effects of radiation on lubricants and seals used in safety-related electrical equipment which it supplies for SHNPP are adequately addressed. Then we describe CP&L's program to assure that the effects of radiation on lubricants used in non-Ebasco supplied safety-related electrical equipment are adequately addressed.

Q.6 What is a lubricant?

A.6 (PMY) A lubricant is an oily or greasy substance which provides a near-frictionless film on two or more surfaces which roll, rub or rotate against each other.

Q.7 What kinds of safety-related electrical equipment at the SHNPP use lubricants?

A.7 (PMY) Motors, valve operators and pumps are three examples of safety-related electrical equipment which use lubricants.

Q.8 What is a "seal," as addressed in Eddleman Contention 9F?

A.8 (PMY) A seal is a device -- static or dynamic; metallic or organic -- that prevents foreign substances from entering equipment or retains a required substance within the equipment.

Q.9 What kinds of safety-related electrical equipment at SHNPP have seals?

A.9 (PMY) Transmitters, valve operators, pumps and resistance temperature detectors are examples of safety-related electrical equipment which have seals.

Q.10 What safety-related electrical equipment does Ebasco supply for the SHNPP?

A.10 (RMB, EJP) Ebasco supplies all balance-of-plant ("BOP") safety-related electrical equipment for SHNPP, i.e., equipment which is not part of the Nuclear Steam Supply System ("NSSS"). This equipment is listed in Table 3.11.0-2 of the Shearon Harris Nuclear Power Plant Final Safety Analysis Report ("FSAR") (Applicants' Exhibit \_\_\_\_).

Q.11 How are lubricants and seals in BOP safety-related electrical equipment environmentally qualified for radiation effects?

A.11 (RMB, EJP) All BOP safety-related electrical equipment for SHNPP which is located in a harsh environment is qualified by test. Equipment which normally contains lubricants or seals is tested with those components as part of the equipment.

Qualification testing consists of accelerated thermal aging, irradiation, and a design basis accident simulation (if applicable). During the irradiation portion of the testing program, electrical equipment is irradiated as a whole, including any seals or lubricants. The qualification test reports identify the radiation dose to which the equipment is exposed. In every case, the radiation exposure of the electrical equipment during testing exceeds the maximum total integrated radiation dose to which the equipment could be exposed over its qualified life. The required radiation exposure is based on

normal operating conditions, design basis accident conditions (if applicable), and post-accident conditions (if applicable). (Not all safety-related electrical equipment is located in areas of the plant which will be subjected to accident and/or post-accident conditions.)

Q.12 How does Ebasco assure that the lubricants and seals tested are the same as the lubricants and seals supplied or recommended by the vendor?

A.12 (RMB, EJP) For BOP equipment, Ebasco reviews the vendor test reports to identify organic components of the tested equipment, including lubricants and seals. Ebasco compares the lubricants and seals identified in the test report to the lubricants and seals supplied or recommended by the vendor in order to verify that they are the same.

Q.13 What steps are taken if lubricants or seals are not identified in the test report, or if there is a discrepancy between the lubricants or seals identified in the test report and those recommended by the vendor?

A.13 (RMB, EJP) If there is a discrepancy, ambiguity or omission concerning the identification of a lubricant or seal which was tested, supplied or recommended by the vendor, Ebasco then attempts to resolve the open item by requesting additional information from the vendor. If the vendor cannot demonstrate that the lubricant or seal supplied or recommended is the same as that tested, corrective action is required to qualify the different components. Any corrective actions must be documented in the environmental qualification package.

Q.14 Who supplies the NSSS safety-related electrical equipment for SHNPP?

A.14 (PMY) Westinghouse supplies this equipment, which is listed in FSAR Table 3.11.0-1. (Applicants' Exhibit \_\_).

Q.15 Are lubricants and seals used in NSSS safety-related electrical equipment?

A.15 (PMY) Yes, some NSSS safety-related electrical equipment use lubricants and seals. Either metallic seals, which are not degraded by the environmental conditions for which electrical equipment must be qualified, or organic seals, which are qualified as part of the equipment tested, are used.

Q.16 How are lubricants in NSSS safety-related electrical equipment environmentally qualified for radiation exposure?

A.16 (PMY) Westinghouse does not identify the specific lubricants used during testing. Rather, Westinghouse recommends a general type of lubricant and provides the specifications the lubricant must meet to assure operability of the equipment.

Therefore, CP&L has contracted for and received a lubrication study performed for the SHNPP by the Mobil Oil Company, a leading lubricant vendor. The purpose of the study was to identify, for each piece of electrical equipment which requires lubrication, the specific brands of lubricants which can be used with that equipment. CP&L currently is reviewing the adequacy of the study.

In the study, the results of radiation stability

testing is provided. Radiation stability testing included standard performance tests which were conducted both before and during irradiation to measure the effects of radiation. For each lubricant to be used in a piece of NSSS electrical equipment, the radiation dose received during lubricant testing will be compared to the total integrated dose which the equipment must be qualified to receive at SHNPP. The radiation dose received during testing must be higher than the dose for which the equipment is required to be qualified. In addition, the performance of the lubricant during testing will be reviewed to verify that the equipment manufacturer's lubricant performance specifications have been met.

Q.17 How will information regarding the qualification of lubricants for radiation exposure be documented?

A.17 (PMY) CP&L will develop an environmental qualification package which will document the tests described in the lubricant study, as well as the analyses which apply the test results to specific electrical equipment at SHNPP.

Q.18 In conclusion, have Applicants adequately addressed the effects of radiation on lubricants and seals in their environmental qualification program?

A.18 (RMB, EJP, PMY) Yes. For lubricants and seals in Ebasco supplied BOP safety-related electrical equipment, the seals and lubricants are exposed to radiation during qualification tests as components of the electrical equipment tested. Ebasco verifies that the seals and lubricants supplied with



safety-related electrical equipment are the same as those tested. Seals in NSSS safety-related electrical equipment are either metallic seals, which need not be qualified, or organic seals, which are qualified as part of the equipment tested. CP&L has contracted for a lubricant study to qualify lubricants to be used in NSSS safety-related equipment and elsewhere in the SHNPP, including qualification for radiation exposure.