



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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May 28, 1981

Herbert Grossman, Esq., Chairman
Administrative Judge
Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Frank F. Hooper
Administrative Judge
School of Natural Resources
University of Michigan
Ann Arbor, Michigan 48109

Mr. Gustave A. Linenberger
Administrative Judge
Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



In the Matter of
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Unit 1
Docket No. 50-395

Dear Licensing Board Members:

Pursuant to the hearing schedule established for the proceeding, direct testimony is to be filed on May 28, 1981. The Staff testimony consists of the relevant portions of the Safety Evaluation Report (SER), and two supplements thereto (SSER 1 and SSER 2), Final Environmental Statement (FES), and the additional written testimony. The SSER 2 and written testimony are enclosed herewith. On May 7, 1981, the Staff filed a motion for summary disposition of Intervenor Bursey's contentions 2, 3 and 4(b). On that same date, the Applicant filed a motion for summary disposition of Intervenor Bursey's contentions 3 and 10. Both motions are still pending decision.

The Staff witnesses and testimony on each of the admitted contentions is as follows:

A. Intervenor Bursey

(a) Contention 2: The Staff testimony on this contention consists of the SSER 1, §20. Michael L. Karlowicz is the Staff witness. A copy of his professional qualifications accompanied the Staff summary disposition motion.

(b) Contention 3: The Staff testimony on this contention consists of the SER, §15.3.5. The Staff witnesses on this matter are Messrs. William Kane, Joseph I. McMillen, and David L. Wiggington. A copy of Mr. Kane's professional qualifications accompanied the Staff summary disposition motion. Copies of the professional qualifications of Messrs. McMillen and Wiggington are enclosed.

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(c) Contention 4: The Staff testimony on this contention consists of the SER, § 2.5.1-2.5.3, 3.7, 3.8, 3.10; Appendices D and E and the SSER 1, §§3.7, 3.10, 18.0 (Item 1); Appendix D. The Staff witnesses are Dr. Phylis Sobel, Richard McMullen, James Knight, NRC, and Dr. Carl A. Newton, Los Alamos Scientific Laboratory. Copies of their professional qualifications are enclosed. In addition, Dr. Andrew Murphy will be made available for Board questioning as requested. A copy of a memorandum from Dr. Murphy to Dr. Robert E. Jackson, dated February 6, 1981, summarizing his position in the case and a copy of his professional qualifications are enclosed.

(d) Contention 8: The Staff testimony on this matter consists of the SSER 2, Appendix A; Region II Office of Inspection and Enforcement (I&E) Inspection Report No. 81-09, dated May 26, 1981, and accompanying memorandum from Jack Richardson, FEMA, to General George Wise, State of South Carolina, dated May 8, 1981. Copies of the I&E Report and FEMA memorandum are attached to the testimony of Thomas A. Kevern on FUA contentions. The Staff witnesses on this contention are Thomas Kevern, NRC, and Jack Richardson, FEMA.

(e) Contention 9: The Staff testimony on this contention consists of the enclosed written testimony of the Office of I&E. The Staff witnesses on this contention are Edward Girard, Virgil A. Brownlee, and Jack Skolds. Copies of their professional qualifications are enclosed.

(f) Contention 10: The Staff testimony on this contention consists of the FES, § 4.5.5 and 4.7.5. The Staff witness on this contention is Dr. Edward F. Branagan. A copy of his professional qualifications accompanied the May 27, 1981 Staff response to the Applicant's motion for summary disposition.

B. Intervenor Fairfield United Action

(a) Contentions 1, 2 and 27: The Staff testimony on this contention consists of the SSER 1, §§13.1 and 22 (pp. 22-1 to 22-9), and the enclosed written testimony of James C. Snell. Mr. Snell is the Staff witness on these contentions. A copy of his professional qualifications is attached to his testimony.

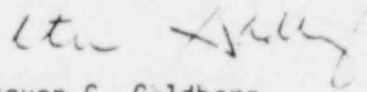
(b) Contentions 7, 9, 10 and 11: The Staff testimony on these contentions consists of the written testimony of Thomas A. Kevern, NRC, and the written testimony of Jack Richardson, FEMA. Copies of their testimony and the individuals' professional qualifications are enclosed.

(c) Contention 8: The Staff testimony on this contention is included within the written testimony of Thomas A. Kevern referenced above.

(d) Contention 12: The Staff testimony on this contention is included within the written testimony of Jack Richardson referenced above.

(e) Contention 13: The Staff testimony on this contention consists of the written testimony of Thomas A. Kevern, referenced above, and the testimony of Dr. Edward F. Branagan, a copy of which is enclosed herewith.

Sincerely,



Steven C. Goldberg
Counsel for NRC Staff

Enclosures:
As stated above

cc: Service List

PROFESSIONAL QUALIFICATIONS AND EDUCATION
OF JOSEPH I. McMILLEN

I am a Reactor Engineer in the Operator Licensing Branch, Division of Human Factors Safety. As a member of this Branch, I am responsible for developing and administering examinations to persons who apply for a license to operate nuclear facilities. I have been a member of this Branch since June 1979 when I was detailed from the Office of Management Information and Program Control, Operations Evaluation Branch. I was selected for this detail because of my previous association with the Operator Licensing Branch (1970-1973) as a full time employee and as a part-time consultant examiner from 1960 thru 1970.

From 1977 to 1979, I worked in the Operations Evaluation Branch and was responsible for reviewing and evaluating reports of occurrences and incidents at facilities for generic safety implications. I selected from these events those that appeared to have a wide interest and wrote them up to be published in a report "Power Reactor Events".

From 1973 to 1977, I participated in the development and implementation of Standard Technical Specifications for nuclear power plants. I had complete responsibility for development of the generic technical specification for the General Electric Boiling Water Reactor.

From 1965-1970, I worked in the Chicago operations office of the Atomic Energy Commission and had lead responsibility for the reactor safety evaluation program, including operator training and qualifications.

From 1962-1965, I was in the Canoga Park area office with lead responsibility for safety review of 7 small reactors and critical assemblies, including operator training and qualifications. I was also Chairman of a joint safety subcommittee for the SNAP-IOA project.

From 1959-1962, I was a site representative responsible for on-site guidance and review of activities of contractors in the design, development and construction of a closed cycle boiling water reactor. I reviewed tests, procedures and operator training.

From 1947-1959, I worked at Argonne National Laboratory beginning as an apprentice reactor operator and worked my way up through the ranks to become operations supervisor in 1954 of the newest Research Reactor. I was responsible for all activities associated with that operation including the training of new operators. I left Argonne in 1959 on a two year leave of absence to assist the AEC in the construction and startup, including training of the operators, for the Elk River Reactor.

I attended the University of Illinois at Nave Pier for one year, 1946-47. And Roosevelt University, Night School from 1948 to 1959 working toward a B.S. in Management Engineering.

PROFESSIONAL QUALIFICATIONS OF
DAVID L. WIGGINTON
PROJECT MANAGER
U. S. NUCLEAR REGULATORY COMMISSION

Project Manager - Operating Reactors: Responsible for managing the safety and environmental reviews of license amendment applications, operations, and occurrences at operating nuclear power plants including planning and coordinating the efforts of other NRC personnel involved in the review.

Education

1962 BS-ME - Louisiana State University
1964 MS-ME/NE - Louisiana State University
1969 Fast Reactor Safety - Massachusetts Institute of Technology
1974 Thermal Reactor Safety - Massachusetts Institute of Technology

Experience

Dec 1980 - Present Senior Project Manager, Operating Reactors Branch, NRR. Assigned Zion Station Unit Nos. 1 & 2

May/Dec 1980 Special Assignment to Emergency Operating Procedures Review; North Anna, Summer, Farley 2

1978 - 1980 Senior Project Manager, Operating Reactors Branch, U. S. Nuclear Regulatory Commission, Assigned Beaver Valley Power Station Unit No. 1 and Donald C. Cook Nuclear Station Unit Nos. 1 and 2.

1974 - 1978 Program Assistant, Division of Site Safety and Environmental Analysis, NRC

1974 Program Staff Assistant, Division of Project Management, NRC

1971 - 1974 Assistant Liquid Metal Fast Breeder Reactor Program Manager, Atomic Energy Commission (AEC)

1968 - 1971 Reactor Engineer, LMFBR, Program Manager's Office, AEC

1967 - 1968 Project Engineer, Heavy Water Reactors Program and Piqua Nuclear Power Facility Decommissioning, AEC

1954 - 1967 Project Engineer, Heavy Water Organic Cooled Reactor Program, AEC

1962 - 1964 Health Physics Technician, Louisiana State University and Hot Cell Operator, Gamma Industries, Baton Rouge, Louisiana

Awards and Honors

1969 Sustained Superior Performance Award, AEC

PHYLLIS SOBEL, PH. D.
GEOSCIENCES BRANCH
DIVISION OF SITE SAFETY AND ENVIRONMENTAL ANALYSIS
U. S. NUCLEAR REGULATORY COMMISSION

My name is Phyllis Sobel and I presently reside at 3526 South Stafford Street, Arlington, Virginia 22206. I am employed as a Geophysicist in the Geosciences Branch, Division of Site Safety and Environmental Analysis, Office of Nuclear Reactor Regulation, Washington, D. C. 20555.

PROFESSIONAL QUALIFICATIONS

In 1969 I received a B. S. degree in Geological Sciences from the Pennsylvania State University. I also pursued graduate studies at Princeton University and the University of Minnesota. In 1978 I received a Ph. D. degree in Geophysics from the University of Minnesota.

From 1970 to 1973 I was a teaching assistant and research assistant at the University of Minnesota. I taught undergraduate laboratories in physical geology, historical geology, and oceanography courses. My activity as a research assistant was in the development and use of a program to simulate marine magnetic anomalies. My interests in graduate school included all areas of geophysics, structural geology, and marine geology. My field experiences included a geophysical cruise to the South Pacific to gather detailed geophysical data on the midoceanic ridge system. My dissertation was a study of seismic phases reflecting off structures below the Earth's crust under several geographic regions.

From 1973 to 1977 I was employed by Teledyne Geotech in Alexandria, Virginia as a research geophysicist. At this corporation's research laboratory I worked on a variety of research problems in seismology related to the detection of nuclear explosions, including (1) the use of filters to extract signals from seismograms, (2) the propagation of Rayleigh waves through heterogeneities, and (3) the characteristics of earthquakes in areas of proposed underground nuclear testing in Asia.

I am a member of the American Geophysical Union and the Seismological Society of America. I have authored or co-authored ten papers published as Teledyne Geotech reports or in the Bulletin of the Seismological Society of America. I have authored or co-authored two papers presented at meetings of the Seismological Society of America.

From October 1977 to March 1978 I was employed as a seismologist by the NRC Office of Standards Development in the revision and development of new regulatory guides and standards and the supervision of technical assistance contracts related to generic problems found in the licensing process. Since March 1978 I have been employed by the Geosciences Branch in the evaluation of the seismological and geophysical data submitted to the NRC in support of a proposed seismic design basis for nuclear facilities. I have participated in the licensing activity for approximately fifteen sites.

RICHARD L. McMULLEN
GEOSCIENCES BRANCH
U. S. NUCLEAR REGULATORY COMMISSION

My name is Richard McMullen. I presently reside at 11221 Waycross Way, Kensington, Md. 20795 and am employed as a geologist in the Geosciences Branch, Division of Site Safety and Environmental Analysis, Office of Nuclear Reactor Regulation, Washington, D. C. 20555.

PROFESSIONAL QUALIFICATIONS

My present duties in this position include: the evaluation of the geological aspects of sites for nuclear power generating facilities and; to analyze and interpret the geological data submitted to the NRC in support of applications for construction and operation of nuclear facilities; the development of guides and criteria; and to act as consultant to the Regulatory Staff on geological matters.

After completion of three years in the Marine Corps I attended the University of Florida and graduated in 1959 with a B.S. degree in Geology. During my professional employment, I completed correspondence courses in soils engineering and quarrying sponsored by the Army Engineer School at Ft. Belvoir, Va., short courses in the effects of ground motions on structures, and airphoto interpreting. I am a registered Geologist and Engineering Geologist in the State of California.

After graduation I worked as a field geologist with the Corps of Engineers District Office in Jacksonville, Florida conducting field geological investigations for flood control structures, levees, canals, military installations, radar sites, and missile launching complexes. I evaluated and wrote reports concerning the stratigraphy, geologic structure, groundwater conditions, and foundation engineering aspects regarding these facilities in Florida, Puerto Rico, Bahama Islands, several of the West Indies Islands, and Panama. In 1963 I was assigned to the Corps of Engineers Canaveral District Office at Cape Kennedy, Florida, first as a staff engineering geologist, and later as District Geologist. My duties were to plan, direct and evaluate the results of geological and foundation studies for missile launch pads and associated facilities for the NASA in Manned Lunar Landing Program, the Air Force, and the Navy. I acted as consultant to other government agencies and architectural engineers in developing design features of structural foundations, monitored the performance of foundations during and after construction, and recommended and monitored necessary foundation treatment techniques such as vibrafloation, grouting, surcharging, dewatering and compaction. I wrote reports on the investigations, geology, foundation design, and construction regarding these projects.

In 1967, I spent 6 months participating in the geological investigations for proposed sea level canal routes in Panama. The region investigated consisted of complex structures of volcanics and folded and faulted sedimentary strata. Among the technique employed in this study were field geologic mapping, geophysical surveying, bore hole photography, and core borings. In 1968, I was transferred to the Huntsville, Alabama

Corps of Engineers Division which was responsible for the siting, design and construction of 15 to 20 (later reduced to 4) safeguard antibalistic missile installations throughout the United States. My duties there were to plan, direct and participate in investigations to determine the suitability of these sites for construction of the missile complexes. I performed geological studies and some soil mechanics work to develop design parameters for foundations and excavations. I also served as technical consultant during design and construction to other government agencies, agricultural engineers, and contractors.

I have been a member of the Nuclear Regulatory Commission staff since January 1971 and have participated in licensing activities for approximately thirty sites for nuclear facilities.

Professional Qualifications

James P. Knight

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Engineering

I am Assistant Director for Components and Structures Engineering responsible for the review and evaluation of design criteria to ensure the integrity of structures, systems and mechanical components, including the dynamic analyses and testing of safety related structures and systems, the geological, geotechnical, seismological and hydrologic characteristics of reactor sites, the seismic design bases, criteria for protection against the dynamic effects associated with natural environmental loads and postulated failures of fluid systems for nuclear facilities and the stability of soils and foundation systems. In this capacity I am responsible for the activities of the Structural Engineering Branch, the Hydrologic and Geotechnical Engineering Branch, the Mechanical Engineering Branch and the Geosciences Branch (geology and seismology).

I received a B.S. Degree in Mechanical Engineering from Northeastern University in 1957. Since that time, I have completed the equivalent of approximately 35 semester hours at the graduate level in structural dynamics, nuclear engineering and fracture mechanics at the Massachusetts Institute of Technology, Lehigh University and the George Washington University.

From June 1957 to September 1959 I served as a commissioned officer with the U. S. Army Corps of Engineers.

From September 1959 to October 1963 I was employed by the Special Products Division of the American Machine & Foundry Company, Alexandria, Virginia.

In the latter period of this experience, I had full responsibility for design concept, material selection and analytical review for critical components of high speed spin test equipment, re-entry simulation systems and spin stabilization test systems for manned and un-manned spacecraft.

In October 1963, I joined the Reactor Radiations Division at the National Bureau of Standards. During this period, I was responsible for the mechanical and structural design, testing and certification of the NBSR core elements, control rod drive mechanisms, high level radiation handling equipment and structures to support reactor components and major experimental facilities. I was also fully responsible for the analytical review and experimental certification of the NBSR reactor vessel and a variety of experimental equipment to the requirements of the ASME Boiler and Pressure Vessel Code. In early 1967, I was appointed Chief of the Engineering Services Section responsible for all structural, mechanical and electrical engineering design services for both the NBSR facility and experimental equipment development. Following receipt of the NBSR operating license, I was appointed Vice-Chairman of the NBSR Hazards Committee responsible for review of the mechanical and structural hazards for all experiments proposed for insertion in the NBSR.

In September 1968, I joined the U. S. Atomic Energy Commission and have remained with this organization through the transition to the U. S. Nuclear Regulatory Commission. In 1973 I was appointed Chief of the Mechanical Engineering Branch. In 1976 I was appointed to my present position. During this time, I have participated in the review and evaluation of over fifty

construction permit and operating license applications and participated in the review and planning activities for Government and industry sponsored programs such as the Heavy-Section Steel Technology Program, development of the B31.7 Nuclear Power Piping Code and the ASME Nuclear Component Code.

I have served as a member of numerous industry code and standards writing bodies including: the ASME Section III Subgroup on Pressure Relief, the ASME Section III Working Group for Design of Valves, the ASME Section III Working Group for Design of Pumps, ANSI B16 Subcommittee N - Steel Valves, ANSI B16 Subcommittee H - Valve Operability and ASME Subcommittee on Qualification of Nuclear Plant Equipment.

PROFESSIONAL QUALIFICATIONS OF CARL A. NEWTON IN THE SCIENTIFIC

DISCIPLINES OF GEOLOGY AND SEISMOLOGY

EDUCATION: B.S. - University of Wisconsin, 1964 (Physics)
M.S. - University of Wisconsin, 1965 (Physics)
Ph.D. - Pennsylvania State University, 1973
(Geophysics)

EMPLOYMENT: Research Assistant, Geophysics Department,
Pennsylvania State University, 1965-69

Research Scientist, Alexandria Laboratories,
Teledyne Geotech, 1969-72

Research Fellow, Seismological Laboratory,
California Institute of Technology, 1973-74

Staff Member, Los Alamos National Laboratory
University of California, 1974 to present

SOCIETIES: Member, American Geophysical Union
Member, Seismological Society of America
Member, Society of Exploration Geophysicists
Member, American Association for the Advance-
ment of Science

PROFESSIONAL EXPERIENCE: Regional crustal refraction profiling
Digital analysis of seismograms from earthquakes,
explosions and hydraulic fracturing
Compressional wave velocity variations associated
with precursive strains of earthquakes
Crust and upper mantle structure as inferred from
Rayleigh wave particle motion
Well-to-well acoustic profiling in hot dry rock
geothermal system
Regional microearthquake monitoring in New Mexico
Review of geologic and seismologic history, and
contemporary tectonics for siting critical
facilities

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