UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DUKE POWER COMPANY, et al.	)	Docket Nos. 50-413
	)	50-414
(Catawba Nuclear Station, Units 1 and 2)	)	

TESTIMONY OF J. M. MCCONAGHY, L. R. BARNES, J. P. AKERS, J. E. CAVENDER, L. W. RUDASILL, J. C. SHROPSHIRE, R. P. RUTH, AND D. H. LLEWELLYN REGARDING IN CAMERA WITNESS #2's ALLEGATIONS CONCERNING LAMINATIONS

Q. PLEASE STATE YOUR NAMES, BUSINESS ADDRESSES, AND YOUR PROFESSIONAL QUALIFICATIONS.

Mr. McConaghy: My name is John M. McConaghy, Jr. My business address is 422 South Church Street, Charlotte, N.C. 28242. I am a Design Engineer II, and a work leader in the Civil Engineering Section, Civil and Environmental Division, Design Engineering Department. A copy of my professional qualifications is attached (Attachment A).

A. Mr. Barnes: My name is L. R. Barnes. My business address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710. My current position is Planning and Control Manager for Construction at the Catawba Nuclear Station. A copy of my professional qualifications is attached to Applicants' testimony addressing the Board's Question Concerning the Containment Spray System.

Mr. Akers: My name is John P. Akers. My business address is P.O. Box 33189, Charlotte, N.C. 28242. My current position is Quality Assurance Supervisor. My responsibilities in this position consist of supervising Quality Assurance Vendor Personnel in HVAC, Civil and Electrical areas, to include performing surveys, audits and surveillance in vendor shops. A copy of my professional qualifications is attached. (Attachment B).

Mr. Cavender: My name is John E. Cavender. My business address is P. O. Box 33189, Charlotte, N.C. 28242. I am a Nondestructive Examination Examiner (NDE) Level III. My responsibilities include training and conducting reviews of NDE results, procedures and NDE personnel. A copy of my professional qualifications is attached to Applicants' testimony addressing the Board's Question Concerning the Containment Spray System.

Mr. Rudasill: My name is Larry W. Rudasill. My business address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710. My current position is Welding Supervisor in Reactor Building #2. In the past, I have held positions as a Welding Inspector and Welder for Duke at Catawba and McGuire Nuclear Station. A copy of my professional qualifications is attached to Applicants' testimony addressing In Camera Witness #2's Allegations Concerning Foreman Override.

Mr. Shropshire: My name is J. C. Shropshire. My business address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710. My current position is Quality Assurance Engineer. I am responsible for the Mechanical, Welding, and NDE Quality Assurance Group. A copy of my professional qualifications is attached to Applicants' testimony addressing the Board's Question Concerning the Containment Spray System.

Mr. Ruth: My name is Ronald R. Ruth. My business address is McGuire Nuclear Station, P. O. Box 488, Cornelius, N. C. 28031. I am Senior QA Engineer responsible for implementation of the Duke Power QA Program at the McGuire Nuclear Station. A copy of my professional qualifications is attached (Attachment C).

Mr. Llewellyn: My name is D. H. Llewellyn. My business address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710. My present position is group leader of Technical Support - Welding. A copy of my professional qualifications is attached to Applicants' testimony addressing Allegations of In Camera Witness #2 Concerning Foreman Override.

Q. ARE YOU FAMILIAR WITH IN CAMERA WITNESS #2's ALLEGATIONS REGARDING LAMINAR-TYPE DISCONTINUITIES?

A. Yes, we have reviewed his testimony. As support for his allegations the witness raises the following major concerns:

1. Laminations in the containment plate are unsafe.

2. Laminations in some penetration sleeves in the containment are unsafe.

3. A 3/8 inch deep hole in one vendor weld near a penetration is unsafe.

Q. HAVE YOU INVESTIGATED THE ALLEGATIONS?

A. Yes. The investigation consisted of an analysis of relevant portions of documents including inspection reports, vendor audits, codes, standards, procedures and calculations regarding this issue and discussions with inspectors, welders and welder foremen.

It should be noted, however, that the issue of laminations was investigated before containment plate was delivered to Catawba. Because laminations are inherent in plate of this type, Duke had researched the issue and developed procedures to address the issue (e.g., CP-88). RPR, JMM.

Q. WHAT WAS THE RESULTS OF YOUR INVESTIGATION?

A. From our investigation we have determined that laminations in the Catawba containment plate and piping penetration sleeves are acceptable. Further, we know of no existing conditions in the plant that could adversely impact plant safety. In addition, adequate controls were in effect to assure that laminar-type edge discontinuities did not result in unacceptable welds. Also, we have determined that the 3/8 inch deep hole in the weld in question did not present a safety hazard. Factors providing support for this determination include those noted below.

1. Laminations in steel plate are caused by the incorporation of a nonmetallic inclusion (i.e., air or gas bubbles, or other foreign material) into the plate. Steel in the molten state is poured into a mold and solidified. During this solidification process, gas bubbles and other nonmetallic substances can get trapped inside the mold and become part of the ingot. The ingot is then reduced in cross-section by rolling. During this rolling process the inclusions are also reduced in cross-section to the degree the ingot is rolled, and they form "planes" or flattened inclusions inside the plate. The amount of the reduction of the plate will dictate the resulting size and thickness of the inclusion. These inclusions are what is referred to as laminations. Laminations are inherent in rolled plate material. RPR, JMM.

2. The containment vessel and the larger penetration sleeves were fabricated from steel plate material in accordance with appropriate ASME requirements. These requirements impose no limit on laminar-type discontinuities, except when they appear at the edge of a plate. Paragraph 9.3 of ASME Specification SA-20 states that laminar-type discontinuities on a plate edge which are 1 inch or less in length are acceptable without repair. RPR, LRB.

The basis for lamination requirements in this ASME standard is that laminations are of structural significance only when they are subjected to loads which would cause them to open, i.e., through-thickness tensile loads which would impose stresses perpendicular to the plane of the laminations. At Catawba, when significant through-thickness loads may be applied to pressure retaining plates, these plates are ultrasonically examined to assure that no unacceptable laminations are present. JMM, JPA.

Service loadings on the Catawba steel containment including the penetration sleeves produce stresses in the plate parallel (not perpendicular) to the surface of any laminations which may be present. These stresses are of no significance to the laminations since they do not tend to open the laminations. Therefore, no laminations in the Catawba steel containment are subjected to loads which would cause degradation to the structure. JMM.

Even though laminar-type discontinuities are acceptable in the plate, their presence may result in some unacceptable defects in welds joining these materials if the laminations are not first removed from the plate edge. The removal process (which for containment plate is as set forth in CP-88) consists of grinding back and sealing laminar-type edge discontinuities. This process is employed, when

required, while joining sections of containment plate. When welding items to the penetration sleeves a similar process would be set forth in specific detailed process control using Form F9B in accordance with QA procedure M-4. Section III of the ASME requires that these welds be radiographed to assure there are no unacceptable weld defects. JEC, RPR, DHL, JCS.

Accordingly, at Catawba welds of containment plate and welds onto containment penetration sleeves were radiographed. Any rejectable weld defects caused by laminations would have been identified by the radiographs and corrected. Indeed, in the In Camera Witness #2's testimony, he attests to the thorough nature of the corrective action regarding this area by his reports on all the corrective action which occurred on one penetration sleeve weld with which he was familiar. JEC, RPR.

2. In his testimony, In Camera Witness #2 described the repair of weld 2NI 15-1 which joins penetration 2M407 to a 32 inch diameter containment penetration sleeve. The process was fully documented in accordance with QA Procedure M-4, the weld was radiographed and all records were accepted by Duke Quality Assurance and the Authorized Nuclear Inspector. In short, there is nothing about this weld that supports any concern regarding the safety of the plant. JCS, DHL, LRB.

3. With regard to In Camera Witness #2's concerns regarding a 3/8 inch deep hole in some vendor weld, we have questioned each of the individuals involved and none recalled the witness pointing out to them a hole in a vendor weld joining a pipe penetration sleeve to a containment plate section as described in the witness' testimony. However, the foreman did recall the witness pointing out a pinhole in a vendor weld on a 20" penetration bellows assembly number 2-M355. This was a 3/16" fillet weld joining the shroud support ring to the stub end of the penetration. It was in close proximity to weld 2FW58-1 which the witness was working on in March and April 1981. Shortly after the witness pointed out the situation, the welder foreman discussed the situation with a member of the Construction Engineering Group who directed that the vendor weld be repaired. It should be noted, however, that the weld did not in any way form a portion of a pressure retaining boundary. The weld simply helped hold in place a shroud which covered a bellows assembly. Thus, even without repair, the weld was clearly acceptable as far as performing the function for which it was intended. JCS, JMM, LRB, LWR.

4. To assure that vendor welds are acceptable, Duke Power Company has a rigid vendor audit and surveillance program. Duke Power audits or evaluates its vendors on a periodic basis to assure compliance with quality

standards. In addition, the pertinent Duke Power Containment Plate Procurement Specification requires that the vendor inspect, nondestructively examine, and repair his fabrication of containment plate as required by ASME III Subsection NE. Duke QA personnel monitor many of these inspections to verify that they are being performed to proper codes and standards. JPA, RPR.

The welds joining penetration sleeves to the containment plate are full penetration T-welds. Paragraph 11.1.2 of the Duke Containment Plate Procurement Specifications requires that the weld first be welded from one side, then the root pass of these welds be back-gouged, that the back-gouged area be magnetic particle examined, that the first pass on the back-gouged side be magnetic particle examined, and that both sides of the final weld be magnetic particle examined and ultrasonically examined. These examinations would have detected rejectable defects in these welds, and they would have been repaired. JMM, JEC, JPA.

Paragraph 7.3 of the Duke Containment Plate Procurement Specifications requires that the vendor provide to Duke a Vendor Quality Assurance Certification form along with all required quality assurance documentation. The Vendor certification consists of a Certificate of Compliance (signed by the Newport News Industrial Corp. QA

Manager) and records of making, nondestructively examining, and repairing these welds. The Certification was reviewed by Engineering Services Division (now Technical Services Division) of Duke's Quality Assurance Department and found to be acceptable. LRB, JPA.

Professional Qualifications
Of
John M. McConaghy, Jr.
Design Engineer II, Civil and Environmental Division
Design Engineering Department
December 9, 1983

My name is John M. McConaghy, Jr. My business address is 422 South Church Street, Charlotte, North Carolina 28242. I am a Design Engineer II, and a work leader in the Civil Engineering Section, Civil and Environmental Division, Design Engineering Department of Duke Power Company.

I hold a Bachelor of Science degree from the United States Military Academy and a Master of Engineering degree in Civil Engineering from Virginia Polytechnic Institute and State University.

From June 1971 to November 1976, I served as a commissioned officer in the U.S. Army Corps of Engineers. From September 1978 to July 1979, I was employed as a researcher by Battelle Columbus Laboratories in Columbus, Ohio. From August 1979 to the present, I have been employed as a structural engineer by Duke Power Company. During this period, I have performed structural, seismic and missile analyses and design for steel, concrete and masonry components.

My current position is Design Engineer II in the Civil Engineering Section of the Design Engineering Department. In this capacity, I am currently responsible for Design Engineering support of the steel containment vessels at Catawba and McGuire Nuclear Stations. I have coordinated and participated in the as-built design analysis of the Catawba steel containment vessels.

I am a registered professional engineer in North Carolina, South Carolina, and Virginia.

RESUME
JOHN P AKERS

PERSONAL: Home Address: 5443 Grafton Drive
Charlotte, NC 28215
Telephone: (704)536-7222 (Home)
(704)373-8247 (Office)
Age: 47 Height: 6'0" Weight: 170 lbs.

FORMAL EDUCATION:

Logan High School	W. Va	1954
West Virginia Tech	W. Va.	Mechanical Engineering (3 yrs.)

ADDITIONAL TRAINING: Duke's Philosophy of Management, Theory of Construction and Maintenance, Krautkramer's Ultrasonic Inspecting and Measuring Course, Mangaflux's Radiographic Interpretation Course, Duke's Magnetic Particle and Liquid Penetrant Inspection Course, Computer Programming and Operation, Steel and Concrete in Construction, plus many others.

WORK EXPERIENCE:

FROM	TO	TITLE	PROGRAM	COMPANY
5/74	Present	QA Supervisor for HVAC, Civil & Electrical Comp.	All	Duke Power

Supervises Quality Assurance personnel performing Quaity Assurance surveys, audits, and surveillances in manufacturing plants of suppliers of HVAC, Civil and Electrical components for nuclear power electric generating stations. Familiar with ASME codes, AWS Codes, 10CFR50 Appendix B, ANSI N45.2 and SNT-TC-1A with a thorough knowledge of Quality Assurance Manuals and internal procedures.

'72	'74	Equipment Specialist	All	Duke Power

Perform Quality Assurance audits and surveillances on mechanical equipment and services for all of Duke's nuclear power plants.

1/70	2/72	Area Manager	Dow Chemical

Supervise industrial cleaning and maintenance area of five states, eight engineers, eight technicians, two salesmen, one mechanic, one secretary and one clerk. Raised industrial cleaning and maintenance revenue from $352,000 to $740,000 maintainig a field margin profit of 31.3% in first 19 months as manager. Served as maintenance consultant to chemical, utility, paper and fiber industries. Initiated and approved contracts with them.

5/69 1/70 Service Manager Dow Chemical

Directed chemical cleaning and hydro-blast operations and was responsible for all maintenance on Charlotte-based equipment. Served as consultant engineer to utility, paper, textile and chemical plants and helped initiate their preventative maintenance programs.

11/66 7/69 Project Engineer Dow Chemical

Provided engineering support for construction and maintenance operations for launch pad for moon shoot. This included HVAC concrete, steel, piping, electrical and instrumentation. Issued field engineering orders for changes in design and served as Liaison Officer to NASA for Apollo missions.

12/63 11/66 Project Engineer Chrysler-Bendix

Supervised three design engineers and seven draftsmen. Provided engineering support for Electrical, Electronic, Heavy Equipment and a Machine Shop. Provided consulting function to outside design agencies to better utilize capabilities of these shops. Initiated contracts to fabrication shops and served on "Quality & Assurance Review Boards".

8/62 12/63 Mechanial Engineer Aerospace Corp.

Performed in Engineering support of Atlas and Titan I Missile for Air Force. Designed and helped build hardware for missile and spacecraft checkout. Programmed and operated IBM 1620 computer.

5/61 8/62 Mechanical Engineer Pan American World Airways

Prepared design studies and calculations for facilities additions and modifications. This included HVAC, architectural, mechanical engineering and transit work.

4/60 8/61 Junior Engineer United Fuel & Gas Co.

Prepared design calculations and layout drawings for natural gas transmission stations.

11/58 4/60 Junior Engineer Island Creek Coal Co.

Prepared mechanical, steel, concrete and piping drawings for modifications to bituminous coal preparation plants.

Attachment C

Professional Qualifications
Of
Ronald P. Ruth
Sr. QA Engineer
McGuire Nuclear Station
Operations Division
December 9, 1983

EDUCATION: Bachelor of Science in Metallurgical Engineering from Mississippi State University

Masters of Science in Metallurgical Engineering from Mississippi State University

Duke Power Company Management Training

Duke Power Company Advanced Management Training

Duke Power Company Effective Management

MT, PT, UT, RT Courses

Welding Inspector

Welding Inspector Instructor

QA Lead Auditor

Mechanical Inspector

EXPERIENCE: Mississippi State University

1970 - 1971 Graduate Assistant

Worked as graduate assistant on a research grant funded by NASA. Worked on Metallurgical Structures on "Skylab" orbital laboratory.

Lenage Forge Division/Gulf & Western, Inc.

1971 - 1974 Marketing Engineer

Lenage Forge Division was a custom forge shop that specialized in forgings for the nuclear industry. Lenage fabricated reactor vessels, steam generators and pressurizer nozzle forgings for companies such as Westinghouse, CE, B&W and GE. My responsibilities were to interface with the reactor vessel manufacturers and resolve any technical problems concerning the forgings being supplies by us. Areas of responsibilities while at Lenage were manufacturing, quality assurance and sales/marketing.

EXPERIENCE: (Cont'd)

Duke Power Company, 1974 - Present

1974 - 1975 Assistant QA Engineer, Engineering & Services Division (E&S)

While in E&S, one of my responsibilities was to help support field engineers in code interpretations (ASME, ANSI, AWS, etc.). Responsible for the review and approval of vendor welding procedures to be used on Duke's products. Responsible for assisting in answering metallurgical questions from all aspects of Duke's work, in construction and design.

1975 - 1977 QA Supervisor, Vendor Division

Responsible for auditing and approving vendors QA programs to be placed on Duke's "Approved Vendor List" in the areas of electrical, engineering, fuels and services (calibration labs, chemical companies and outside consultants). Also, I was responsible for scheduling and performing surveillances on approved vendors to check to see they maintained compliance with their approved QA program.

1977 - 1979 QA Engineer, Construction Division

Responsible for the supervision and direction for the implementation of the QA program in the areas of mechanical piping, equipment and system testing, welding and NDE. Reviewed and approved NCI's, and interfaced with NRC inspectors while on project site. Reviewed all completed documentation to assure compliance with specified requirements.

1979 - Present Sr. QA Engineer, Operations Division

Responsible for the implementation of the Duke Power QA program at the McGuire Nuclear Station. There are three major areas of responsibility, 1) Q.C. inspection program, 2) QA surveillance program, and 3) QA technical support.