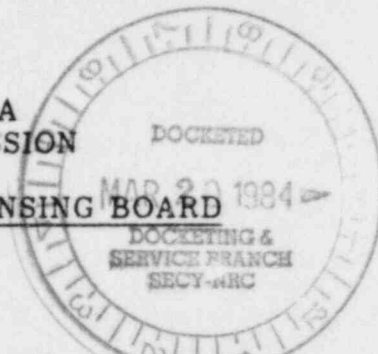


A-111
1/30/84UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



In the Matter of)
)
 DUKE POWER COMPANY, et al.)
)
 (Catawba Nuclear Station,)
 Units 1 and 2))

Docket Nos. 50-413
 50-414

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

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

3 Mr. McConaghy: My name is John M. McConaghy, Jr. My business
 4 address is 422 South Church Street, Charlotte, N.C. 28242. I am
 5 a Design Engineer II, and a work leader in the Civil Engineering
 6 Section, Civil and Environmental Division, Design Engineering
 7 Department. A copy of my professional qualifications is attached
 8 (Attachment A).
 9

10 A. Mr. Barnes: My name is L. R. Barnes. My business address is
 11 Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710.
 12 My current position is Planning and Control Manager for
 13 Construction at the Catawba Nuclear Station. A copy of my
 14 professional qualifications is attached to Applicants' testimony
 15 addressing the Board's Question Concerning the Containment Spray
 16 System.
 17

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

8
9 Mr. Cavender: My name is John E. Cavender. My business
10 address is P. O. Box 33189, Charlotte, N.C. 28242. I am a
11 Nondestructive Examination Examiner (NDE) Level III. My
12 responsibilities include training and conducting reviews of NDE
13 results, procedures and NDE personnel. A copy of my professional
14 qualifications is attached to Applicants' testimony addressing the
15 Board's Question Concerning the Containment Spray System.

16
17 Mr. Rudasill: My name is Larry W. Rudasill. My business address
18 is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710.
19 My current position is Welding Supervisor in Reactor Building #2.
20 In the past, I have held positions as a Welding Inspector and
21 Welder for Duke at Catawba and McGuire Nuclear Station. A copy
22 of my professional qualifications is attached to Applicants' testimony
23 addressing In Camera Witness #2's Allegations Concerning Foreman
24 Override.

1 Mr. Shropshire: My name is J. C. Shropshire. My business
2 address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C.
3 29710. My current position is Quality Assurance Engineer. I am
4 responsible for the Mechanical, Welding, and NDE Quality Assurance
5 Group. A copy of my professional qualifications is attached to
6 Applicants' testimony addressing the Board's Question Concerning
7 the Containment Spray System.

8
9 Mr. Ruth: My name is Ronald R. Ruth. My business address is
10 McGuire Nuclear Station, P. O. Box 488, Cornelius, N. C. 28031.
11 I am Senior QA Engineer responsible for implementation of the Duke
12 Power QA Program at the McGuire Nuclear Station. A copy of my
13 professional qualifications is attached (Attachment C).

14
15 Mr. Llewellyn: My name is D. H. Llewellyn. My business address
16 is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710.
17 My present position is group leader of Technical Support - Welding.
18 A copy of my professional qualifications is attached to Applicants'
19 testimony addressing Allegations of In Camera Witness #2 Concerning
20 Foreman Override.

21
22 Q. ARE YOU FAMILIAR WITH IN CAMERA WITNESS #2's ALLEGATIONS
23 REGARDING LAMINAR-TYPE DISCONTINUITIES?

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

- 26 1. Laminations in the containment plate are unsafe.

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

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

5

6 Q. HAVE YOU INVESTIGATED THE ALLEGATIONS?

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

11

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

17

18 Q. WHAT WAS THE RESULTS OF YOUR INVESTIGATION?

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

- 1 1. Laminations in steel plate are caused by the incorporation
2 of a nonmetallic inclusion (i.e., air or gas bubbles, or
3 other foreign material) into the plate. Steel in the molten
4 state is poured into a mold and solidified. During this
5 solidification process, gas bubbles and other nonmetallic
6 substances can get trapped inside the mold and become
7 part of the ingot. The ingot is then reduced in
8 cross-section by rolling. During this rolling process the
9 inclusions are also reduced in cross-section to the degree
10 the ingot is rolled, and they form "planes" or flattened
11 inclusions inside the plate. The amount of the reduction
12 of the plate will dictate the resulting size and thickness
13 of the inclusion. These inclusions are what is referred to
14 as laminations. Laminations are inherent in rolled plate
15 material. RPR, JMM.
16
17 2. The containment vessel and the larger penetration sleeves
18 were fabricated from steel plate material in accordance
19 with appropriate ASME requirements. These requirements
20 impose no limit on laminar-type discontinuities, except
21 when they appear at the edge of a plate. Paragraph 9.3
22 of ASME Specification SA-20 states that laminar-type
23 discontinuities on a plate edge which are 1 inch or less in
24 length are acceptable without repair. RPR, LRB.
25

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

11
12 Service loadings on the Catawba steel containment
13 including the penetration sleeves produce stresses in the
14 plate parallel (not perpendicular) to the surface of any
15 laminations which may be present. These stresses are of
16 no significance to the laminations since they do not tend
17 to open the laminations. Therefore, no laminations in the
18 Catawba steel containment are subjected to loads which
19 would cause degradation to the structure. JMM.

20
21 Even though laminar-type discontinuities are acceptable in
22 the plate, their presence may result in some unacceptable
23 defects in welds joining these materials if the laminations
24 are not first removed from the plate edge. The removal
25 process (which for containment plate is as set forth in
26 CP-88) consists of grinding back and sealing laminar-type
27 edge discontinuities. This process is employed, when

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

8
9 Accordingly, at Catawba welds of containment plate and
10 welds onto containment penetration sleeves were
11 radiographed. Any rejectable weld defects caused by
12 laminations would have been identified by the radiographs
13 and corrected. Indeed, in the In Camera Witness #2's
14 testimony, he attests to the thorough nature of the
15 corrective action regarding this area by his reports on all
16 the corrective action which occurred on one penetration
17 sleeve weld with which he was familiar. JEC, RPR.

- 18
19 2. In his testimony, In Camera Witness #2 described the
20 repair of weld 2NI 15-1 which joins penetration 2M407 to a
21 32 inch diameter containment penetration sleeve. The
22 process was fully documented in accordance with QA
23 Procedure M-4, the weld was radiographed and all records
24 were accepted by Duke Quality Assurance and the
25 Authorized Nuclear Inspector. In short, there is nothing
26 about this weld that supports any concern regarding the
27 safety of the plant. JCS, DHL, LRB.

- 1 3. With regard to In Camera Witness #2's concerns regarding
2 a 3/8 inch deep hole in some vendor weld, we have
3 questioned each of the individuals involved and none
4 recalled the witness pointing out to them a hole in a
5 vendor weld joining a pipe penetration sleeve to a
6 containment plate section as described in the witness'
7 testimony. However, the foreman did recall the witness
8 pointing out a pinhole in a vendor weld on a 20"
9 penetration bellows assembly number 2-M355. This was a
10 3/16" fillet weld joining the shroud support ring to the
11 stub end of the penetration. It was in close proximity to
12 weld 2FW58-1 which the witness was working on in March
13 and April 1981. Shortly after the witness pointed out the
14 situation, the welder foreman discussed the situation with
15 a member of the Construction Engineering Group who
16 directed that the vendor weld be repaired. It should be
17 noted, however, that the weld did not in any way form a
18 portion of a pressure retaining boundary. The weld
19 simply helped hold in place a shroud which covered a
20 bellows assembly. Thus, even without repair, the weld
21 was clearly acceptable as far as performing the function
22 for which it was intended. JCS, JMM, LRB, LWR.
23
24 4. To assure that vendor welds are acceptable, Duke Power
25 Company has a rigid vendor audit and surveillance
26 program. Duke Power audits or evaluates its vendors on
27 a periodic basis to assure compliance with quality

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

8
9 The welds joining penetration sleeves to the containment
10 plate are full penetration T-welds. Paragraph 11.1.2 of
11 the Duke Containment Plate Procurement Specifications
12 requires that the weld first be welded from one side,
13 then the root pass of these welds be back-gouged, that
14 the back-gouged area be magnetic particle examined, that
15 the first pass on the back-gouged side be magnetic
16 particle examined, and that both sides of the final weld
17 be magnetic particle examined and ultrasonically examined.
18 These examinations would have detected rejectable defects
19 in these welds, and they would have been repaired.
20 JMM, JEC, JPA.

21
22 Paragraph 7.3 of the Duke Containment Plate Procurement
23 Specifications requires that the vendor provide to Duke a
24 Vendor Quality Assurance Certification form along with all
25 required quality assurance documentation. The Vendor
26 certification consists of a Certificate of Compliance
27 (signed by the Newport News Industrial Corp. QA

1 Manager) and records of making, nondestructively
2 examining, and repairing these welds. The Certification
3 was reviewed by Engineering Services Division (now
4 Technical Services Division) of Duke's Quality Assurance
5 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:

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

Supervises Quality Assurance personnel performing Quality 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
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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
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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 maintaining 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.

RESUME
JOHN P AKERS
Page 2

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 Mechanical 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.

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 supplied by us. Areas of responsibilities while at
Lenage were manufacturing, quality assurance and
sales/marketing.

EXPERIENCE: Duke Power Company, 1974 - Present
(Cont'd) 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.

NUCLEAR REGULATORY COMMISSION
Docket No. 50-43
In the matter of Catawba
Applicant ✓
Intervenor ✓
Complainant ✓
Other ✓
Reporter Rebecca Eyster
DATE 1/30/84