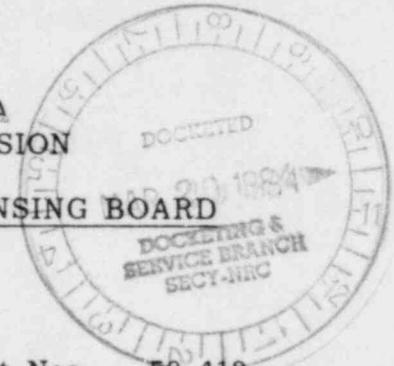


A-110
1/30/84

UNITED 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 DAVID H. LLEWELLYN, JOHN M. MCCONAGHY, JR.,
AND RONALD P. RUTH PERTAINING TO MR. LANGLEY'S ALLEGATION
CONCERNING THE DETECTION OF A LAMINATION IN A GRINDING GOUGE

1 Q. STATE YOUR NAMES AND BUSINESS ADDRESSES.

2 A. David H. Llewellyn, my business address is Catawba Nuclear
3 Station, P. O. Box 223, Clover, South Carolina, 29710.

4
5 John M. McConaghy, my business address is 422 South Church
6 Street, Charlotte, N. C. 28242.

7
8 Ronald P. Ruth, my business address is McGuire Nuclear Station,
9 Huntersville, North Carolina.

10
11 Q. STATE YOUR PRESENT JOB POSITION WITH DUKE POWER
12 COMPANY AND DESCRIBE THE NATURE OF YOUR JOB.

13 A. Mr. Llewellyn:
14 I am an Associate Field Engineer in the Construction Department,
15 presently serving as the group leader of the Technical
16 Support-Welding section. I am responsible for managing and
17 directing the work of 1 engineer, 1 supervisor, and 11 technicians.

1 We provide technical support to craft organizations in resolution of
2 welding related problems assuring that procedural and code
3 requirements are met. We are responsible for qualifying welding
4 procedures and welders at Catawba Nuclear Station. We act as the
5 interface between Design Engineering and the craft organization
6 concerning welding related information. We resolve NCI's, write
7 Construction Procedures, maintain the welding program, and issue
8 process control documentation. I am responsible for reviewing the
9 work of my people, assuring my group is properly trained, and on
10 occasions perform training of the welding craft organization. I
11 interface on a regular basis with auditing groups including the
12 NRC.

13

14 Mr. McConaghy:

15 I am presently a Design Engineer and a work leader in the Civil
16 Engineering Section, Civil and Environmental Division, of the
17 Design Engineering Department of Duke Power Company. I am
18 currently responsible for Design Engineering Support of the steel
19 containment vessels at the Catawba and McGuire Nuclear Stations.

20

21 Mr. Ruth:

22 I am presently Senior QA Engineer, Operations Division at the
23 McGuire Nuclear Station, and I am responsible for QC inspection,
24 the QA surveillance program, and QA technical support.

1 Q. DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND
2 QUALIFICATIONS.

3 A. Mr. Llewellyn:

4 I graduated with a B.S. in Civil Engineering from Duke University
5 in May, 1977. I am a Registered Professional Engineer in the State
6 of North Carolina. I started employment with Duke Power in June
7 of 1977 as a Junior Field Engineer in my present group. Since
8 February 1981 I have served as the group leader of the Technical
9 Support-Welding group.

10

11 Mr. McConaghy:

12 I am a graduate of the United States Military Academy, and I have
13 a Master of Engineering Degree in Civil Engineering from Virginia
14 Polytechnic Institute. A more complete statement of my professional
15 experience and qualifications is set forth in Attachment A.

16

17 Mr. Ruth:

18 I have both Bachelor of Science and Master of Science degrees in
19 Metallurgical Engineering from Mississippi State University. A
20 more complete statement of my professional experience and
21 qualifications is set forth in Attachment B.

22

23 Q. ARE YOU FAMILIAR WITH MR. LANGLEY'S TESTIMONY REGARDING
24 THIS ALLEGATION?

25 A. Yes, we have reviewed Mr. Langley's allegation concerning a
26 lamination in the containment plate. We have responded to these

1 questions about Mr. Langley's allegation jointly, but have placed
2 our respective initials with the specific testimony that each of us
3 sponsors. JMM, DHL, RPR

4

5 Q. HAVE YOU INVESTIGATED THIS ALLEGATION?

6 A. Mr. Llewellyn:

7 Yes, I have conducted a review of the containment welding
8 documentation for the entire period Mr. Langley was a welding
9 inspector, from November 1977 through April 1978. I was unable
10 to locate any documentation written by Mr. Langley concerning
11 this allegation. There is process control documentation which
12 indicates that there were repairs of surface laminations on plates
13 on the containment. There was no indication of repairs in the
14 area described by Mr. Langley. Laminations are repaired by
15 grinding and rewelding, if required, by procedures. DHL.

16

17 Messrs. Ruth and McConaghy:

18 We have reviewed the allegation and discussed the documentation
19 with Mr. Llewellyn. RPR, JMM

20

21 Q. DESCRIBE HOW LAMINATIONS ARE FORMED IN STEEL PLATE.

22 A. Laminations in steel plate are caused by the incorporation of a
23 nonmetallic inclusion (i.e., air or gas bubbles, or other foreign
24 materials) into the plate. Steel in the molten state is poured into
25 a mold and solidified into an ingot. During this solidification
26 process, air bubbles and other nonmetallic substances can get
27 trapped inside the mold and become part of the ingot. The ingot

1 is then reduced in cross section by rolling. During this rolling
2 process the inclusions are also reduced in cross section to the
3 degree the ingot is rolled, and they form "planes" or flattened
4 inclusions inside the plate. The amount of the reduction of the
5 plate will dictate the resulting size and thickness of the
6 inclusion. These inclusions are what is referred to as
7 laminations. Laminations are inherent in rolled plate material.
8 RPR

9
10 Q. DOES THE ASME CODE RECOGNIZE AND MAKE ALLOWANCES FOR
11 LAMINATIONS?

12 A. Yes, the ASME Code recognizes that rolled products such as plate
13 have laminations and it allows for certain size laminations to be left
14 in plate material without being removed. JMM, RPR

15
16 Q. DESCRIBE THE METHODS FOR IDENTIFYING AND CORRECTING
17 LAMINATIONS IN STEEL PLATES.

18 A. Several methods existed in the QA program at the time Mr. Langley
19 was an inspector which were designed specifically to handle
20 laminations. Construction Procedure 88 was written to provide
21 instructions for the investigation and sealing of laminations detected
22 in the weld edge bevels prior to welding the containment plate.
23 Construction Procedure 64 was written to describe the methods by
24 which minor surface repairs could be performed and for the
25 evaluation of removal areas for minimum wall thicknesses. CP 88
26 and CP 64 take into account limits stated in the ASME Code and
27 what to do if these limits are exceeded.

1 QA Procedure M-19 provided a form (Form M-19E) which could be
2 originated by the welding inspector to document unacceptable
3 surface conditions and to allow for minor surface repairs. Major
4 surface repairs (those deeper than one-third of the wall thickness)
5 were documented by the Technical Support-Welding group on the
6 weld identification drawing for the containment, and detailed
7 process control (Form M-19A) was initiated by Technical Support to
8 document these repairs. DHL, RPR

9

10 Q. WHAT ARE THE CONSEQUENCES OF ANY LAMINATIONS THAT MAY
11 NOT HAVE BEEN DETECTED OR DO NOT REQUIRE REMOVAL?

12 A. Laminations are of structural significance only when they are
13 subjected to loads which would cause them to open. Service loadings
14 on the steel containment produce stresses in the plate parallel to
15 the surface of any laminations which may be present. These
16 stresses are of no significance to the laminations since they do not
17 tend to open the lamination or to make it grow. Therefore, any
18 laminations in the Catawba steel containment are not subjected to
19 stresses which would cause degradation of the structure.
20 Additionally, the containment plate material has been subjected to
21 impact testing in accordance with the ASME Code to ensure that any
22 flaws, including laminations, would not create an unsafe condition.
23 JMM, RPR

1 Q. WHAT DID YOU CONCLUDE AS A RESULT OF YOUR
2 INVESTIGATION?

3 A. To the best of our knowledge, there is no reason to believe that
4 Mr. Langley's allegation represents a condition adverse to quality.
5 We are not aware of any instances where laminations were not
6 properly identified by inspectors, documented, evaluated and
7 repaired, if necessary, in accordance with the existing procedures
8 for laminations or gouges. In addition, the welding inspectors are
9 well trained to identify deficiencies of this nature, and trained in
10 the applicable procedures governing acceptance or rejection of
11 identified conditions. DHL, RPR

12

13 Mr. McConaghy:

14 From a design standpoint, I conclude that there is no reason to
15 believe that Mr. Langley's allegation represents a condition adverse
16 to quality.

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

My name is John M. McConaghy, Jr. My business address is 422 South 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 registered professional engineer in North Carolina, South Carolina, and Virginia.

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: 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. 50-413
In the matter of Catawba
Staff ✓
Applicant ✓
License No. 110
Type of License ✓
Date of Issuance ✓
Expiration Date 1/30/84
Applicant's Name Rebecca Eyster