A-97
12/15/83

app # 97

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. E. CAVENDER, W. E. ROGERS, D. H. LLEWELLYN, AND L. R. BARNES REGARDING IN CAMERA WITNESS #2's ALLEGATIONS CONCERNING ACCURACY OF RADIOGRAPHS

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

A. 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 qualification of NDE personnel, the development and approval of NDE procedures, and the periodic review of NDE records. A copy of my professional qualifications is attached to Applicants' testimony addressing the Board's Question Concerning the Containment Spray System.

Mr. Rogers: My name is W. E. (Bill) Rogers. My business address is Catawba Nuclear Station, P. O. Box 223, Clover, S. C. 29710. My current position is Welding Superintendent. I am responsible for Welding at Catawba. My department consist of approximately 550 employees. Prior assignments have included Welding General Foreman, Welding Foreman, Welding Inspector, and Welder with Duke Power. A copy of my professional qualifications

is attached to Applicants' testimony addressing In Camera Witness #2's Allegations Concerning Foreman Override.

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 Applicant's testimony addressing In Camera Witness #2's Allegations Concerning Foreman Override.

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 of construction at Catawba Nuclear Station. A copy of my professional qualifications is attached to Applicants' testimony addressing the Board's Question Concerning the Containment Spray System.

Q. ARE YOU FAMILIAR WITH IN CAMERA WITNESS #2's ALLEGATION THAT RADIOGRAPHS WERE BEING INACCURATELY INTERPRETED AND THAT THIS COULD HAVE RESULTED IN UNACCEPTABLE DEFECTS IN WELDS?

A. Yes. We have reviewed his testimony. As support for his allegation the witness' major concerns include the following:

(1) Although he is "no radiographer", he states that in attempting to correct welds which radiographers have determined are deficient, at times he could not find the defect noted by the radiographer or would find a defect in a location in the weld

other than that noted. Also, he alleges that at times radiographs of corrected welds would point out defects not noted in the earlier radiographs.

(2) The witness alleges that in early 1982, Mr. Pridmore (one of the "better welders" in Henry Best's crew) had informed him of a weld in the Unit 1 reactor building which had passed a radiograph inspection in 1980 and in early 1982 had been rejected by a visual welding inspector. (all)

Q. HAVE YOU INVESTIGATED THE ALLEGATION?

A. Yes. This investigation consisted of a review of relevant portions of records regarding this issue and discussions with Level I and II radiographers, welders, welder foremen, welder general foreman, and the welder superintendent. (all)

Q. WHAT WAS THE RESULT OF YOUR INVESTIGATION?

A. From our investigation, we determined that radiographers at the Catawba site are qualified to do their job, that adequate controls are in effect to assure that radiographs are accurately interpreted and that unacceptable weld defects are identified and repaired. Furthermore, to the best of our knowledge, there are no defective welds in the Catawba plant. Factors providing support for this determination include those noted below.

1. There are three levels of radiography certification, i.e., Level I inspectors (assist in making radiographs), Level II inspectors (may make radiographs on their own and

may interpret them if assigned to an interpreter's position) and Level III examiners (may also perform functions including administering qualification exams). The Level I radiographers at the Catawba site are certified only after an extensive and thorough period of instruction (on the average about 6 months) culminating in a comprehensive written and practical examination during which they must prove their abilities. To be selected as a candidate for Level II testing and certification, the Level I radiographer must train for a minimum of nine additional months during which time his work is checked to assure that he is completely qualified and that he has sound, basic interpretive skills. The Level II certification is awarded only after another very extensive written and practical exams (e.g., the practical exam lasts about 2 days). Even after certification, the Level II radiographers must still undergo an "apprenticeship" before being considered to fill an interpreter's position at Duke. (No Level II QC interpreters at Catawba have had less than 3 years experience, and no Level II QA interpreters at Catawba have had less than 8 years experience.) Further, even after being assigned an interpreter's position, the work of the Level II radiographer (like all other certified radiographers assigned radiographer positions) is reviewed at least annually and every three years he must undergo a recertification. In short, the radiographers at

Catawba are well-trained and highly skilled employees whose proficiency is continuously reconfirmed. JEC.

2. QA Procedure M-4 paragraph 4.7 requires that every radiograph be reviewed and evaluated by a certified NDE Level II Inspector. Procedure NDE-10 paragraph 18 requires that the inspector verify that the radiograph is properly exposed and has adequate coverage for interpretation, and that he interprets the radiograph to identify any indications of weld defects which would be rejectable under ASME III NB-5320 or NC-5320, as appropriate, for the weld. In addition, QA Procedure NDE-10 Paragraph 17.2 requires that a separate Level II inspector check the interpretations of the first inspector for accuracy. If it is determined that a rejectable defect exists, QA Procedure M-4 requires that the weld be rejected until corrections are made and the weld is again radiographed and accepted by two certified Level II Inspectors. This rejection cycle will continue until acceptance is achieved. After total acceptance by two certified NDE Level II film interpreters, procedure M-4 paragraph 4.11 requires that ASME Code weld records be made available for review by the Authorized Nuclear Inspector. If he should find a rejectable defect, the entire cycle begins again. In addition, the Level III inspector periodically reviews the work of the two interpreters. Significantly, In Camera Witness #2 has not identified any weld which is defective or any specific weld

which he questions. In short, procedures require thorough and independent review of all radiographs by at least two qualified inspectors and periodic checks of these reviews by a third Level III Inspector and the Authorized Nuclear Inspector. JEC, LRB.

3. With regard to In Camera Witness #2's concerns regarding not finding defects or finding defects in locations other than that identified by the Level II radiography reviewers, there are several possible explanations for this. First, when a welder cuts into a weld using an air arc to remove an identified defect, he quite likely will remove the metal so quickly that some defects may be removed before he sees them. When blending out a smooth repair area, he might also come across a small area of porosity or slag that he might consider to be a defect, but because of its size may be acceptable under the Code. JEC, WER, DHL.

Second, the actual process of radiographing and providing the welder information on any identifiable defect will, in many cases, result in a shift in the observed location of the defect. To explain, when a defect is identified on a radiograph, the interpreter prepares, on a piece of translucent plastic, a tracing of the radiograph showing the location and nature of the rejectable defect by referencing it to location numbers around the circumference of the weld. Prior to repairing the weld,

the welder should align the location numbers on the tracing to the corresponding locations on the weld which were marked during radiography. Failure to carefully and accurately align the location numbers and weld configuration can result in improperly marking the defect location on the weld, i.e., shifting of the defect. In addition, the geometrical relationship between the source used in radiography, the defect, and the film can result in the defect location on the tracing being displaced from the actual defect location on the weld circumference. In any event, the allegations that defects pointed out by radiographs may not be found by the welder, or may not be found in the precise locations noted, provides no basis for concluding that rejectable defects in welds are not being identified and corrected. The witness has not pointed out any welds where this is the case. (It should be noted that we raised this issue with many other welders at Catawba and they stated that this was not an area of concern). In any event, because radiographs of areas of weld repair are done on not only the area of concern but also on the two adjacent areas, any rejectable defects not corrected in the initial repair effort will be identified in the subsequent radiograph. While this could lead to a greater expenditure of Duke resources, it is not a situation affecting plant safety. JEC, WER, DHL.

4. With regard to In Camera Witness #2's concern that new radiographs of welds which had previously been corrected

reflected defects in areas which were not repaired, there are several possible explanations. First, the new radiograph may have been made using more sensitive film than was used originally. (The Code requires that film have a certain minimum sensitivity, but we sometimes use more sensitive film to aid the interpreter to evaluate borderline indications.) This is completely in accordance with the Code and is not indicative of faulty interpretation of the initial radiograph or rejectable "defects" slipping by the process. JEC.

A second possible explanation regarding "new" defects in reradiographed welds is the practice of opening a small hole through the weld on the opposite side from the repair area so that the interior side of the repair can be observed during welding in order to avoid root defects. This "viewing port" must be rewelded, and its area reradiographed to assure no defects are present. This appears to be the situation that the In Camera Witness #2 is referring to on Tr. 291. JEC, WER.

A third possible explanation regarding "new" defects in reradiographed welds is that if a defect is repaired near a location marker; not only is the area in which the repair was made reradiographed, but also the adjacent area in order to assure complete coverage. This different radiograph geometry could detect a previously undetected indication. Because of Duke's conservative policy this

new indication would receive appropriate attention. JEC, WER.

The significant point regarding this concern is that while more welder time may be needed to repair defects in areas where originally no defects were noted, or defects which "suddenly" appear in locations other than where they were reported, in neither case is the interpretative skill of the reviewer called into question or the final adequacy of the weld at issue. It should be noted that we asked many welders at Catawba if they had a concern similar to the witness and in no case did any respond that they did. JEC, WER.

5. With regard to In Camera Witness #2's concerns regarding the rejected weld of Mr. Pridemore (identified as INC56-8), this incident was documented on nonconforming item report 12549. The report and subsequent discussions revealed that the NDE Level III Inspector had evaluated this weld and determined that the radiograph was accurately interpreted and that the weld was acceptable. However, in that there was some disagreement ~~(of which this Board has already heard testimony)~~ regarding the weld, Duke chose the conservative approach and took appropriate action. Specifically, some additional grinding was done on the weld, it was reinspected and reradiographed and determined to meet requirements of ASME III NC-4424(e). JEC, DHL, LRB.

NUCLEAR REGULATORY COMMISSION

Docket No. 50-413 Official Exh. No. 97

In the matter of Catawba

Staff ________ IDENTIFIED ✓

Applicant ✓ RECEIVED ✓

Intervenor ________ REJECTED ________

Cont'g Off'r ________

Contractor ________ DATE 12/15/83

Other ________ Witness ________

Reporter Mary [illegible]