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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

HOUSTON LIGHTING & POWER  
COMPANY, ET AL.

(South Texas Project,  
Units 1 & 2)

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Docket Nos. 50-498OL  
50-499OL

TESTIMONY OF RICHARD BUCKALEW AND JOHN B. DUKE  
ON ALLEGED FALSIFICATION OF CADWELD RECORDS

Q. 1 Please state your names.

A. 1 Richard Buckalew and John B. Duke.

Q. 2 Mr. Buckalew and Mr. Duke, by whom are you employed?

A. 2 (RB): Brown & Root, Inc. (B&R)

(JBD): Brown & Root Saudia Arabia Ltd.

Q. 3 Please state your position and current responsibilities.

A. 3 (RB): I am systems engineering technician in the Brown & Root Construction Department at STP.

(JBD): I am coatings and backfill superintendent for the oil and gas pipeline project for the Khurais Area Expansion in the central province of Saudia Arabia.

Q. 4 Please summarize your qualifications and your experience with the South Texas Project (STP).

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5 A. 4 (RB): I started working on construction when I  
6 joined B&R in February 1974. At that time, I worked in  
7 cleanliness control at the piping department in the Brunswick  
8 Nuclear Project in North Carolina. In April, 1976 I began  
9 working at STP as a Cadwelder\* and Cadwelder Material Handler.  
10 In 1977 I became a Construction Foreman and remained in that  
11 position until February 1980 when I was assigned to be a  
12 Systems Engineering Technician in the Construction Department.  
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19 (JBD): I have been engaged in Quality Control (QC)  
20 work since 1974. From 1974 to 1976 I worked for U.S. Testing  
21 Laboratories and was assigned to perform various QC inspection  
22 and testing activities at the Susquehanna Nuclear Project,  
23 and the St. Lucie Nuclear Power Plant. I joined B&R in  
24 February 1976 to work as a QC Inspector at STP. My duties  
25 in that position included quality inspections of concrete  
26 pre-placement, placement and post-placement activities  
27 including rebar erection and Cadwelding. I left STP in June  
28 1977 when I went to work for six months as QC Civil Inspector  
29 for Indiana-Michigan Power Company. I returned to B&R in  
30 January 1978 and worked first as a QC Civil Inspector in  
31 HL&P's W.A. Parish Units 5 and 6 fossil-fired power plants;  
32 from October 1978 to April 1981 I was an Engineering Specialist  
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48 \* "Cadweld" is a registered Trademark of Erico Products,  
49 Inc.  
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5 in B&R's Quality Assurance (QA) Department. In April 1981 I  
6 was assigned to work overseas in my current position.  
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8 Q. 5 What is the purpose of your testimony?  
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10 A. 5 (RB, JBD): Our testimony will address an allega-  
11 tion, which was investigated by the NRC in May 1978 and  
12 discussed in I&E Report 78-09, that the as-built Cadweld  
13 location records for the Reactor Containment Building Unit 1  
14 basemat have been falsified. Our testimony will show that  
15 this falsification allegation is totally without basis.  
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21 Q. 6 Mr. Duke, were you involved with the STP at the  
22 time the Unit 1 Reactor Containment Building (RCB) basemat  
23 was being constructed, and if so, what was the nature of  
24 your involvement?  
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28 A. 6 (JBD): Yes, I was involved with STP during that  
29 period of time, which was the first half of 1976. At the  
30 time, I was a QC Cadweld Inspector at STP.  
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34 Q. 7 What were your duties as Cadweld Inspector?  
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36 A. 7 (JBD): I performed in-process Cadweld inspections  
37 on a surveillance basis and daily final inspections on  
38 Cadwelds shot that day or the day before. I performed  
39 random tensile tests of completed Cadwelds; and I inspected  
40 the ultimate placement of the Cadwelds into the plant struc-  
41 tures to ensure that they were installed in the proper  
42 location.  
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4 Q. 8 What items did you check on during final Cadweld  
5 inspection?  
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8 A. 8 (JBD): In a final Cadweld inspection, as required  
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10 by the applicable QC and construction procedures, I verified  
11 that the Cadwelder was qualified to shoot that type (position)  
12 of Cadweld; verified that the sleeve was properly centered  
13 by checking the witness marks applied to the bars prior to  
14 shooting the Cadweld; inspected for the presence of slag or  
15 voids and for excessive porosity; and recorded the results  
16 of the inspection plus the Cadweld number, sleeve and powder  
17 material and identification and the sizes of bars joined by  
18 the Cadweld in my inspection book. If the Cadweld passed  
19 the inspection, I marked it with a white stripe of paint so  
20 that it could be distinguished from uninspected or rejected  
21 ones.  
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24 Q. 9 How were completed Cadwelds identified?  
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26 A. 9 (JBD): The Cadwelder would mark with a grease  
27 pencil on the sleeve of each completed Cadweld a unique  
28 number, which consisted of three parts: the Cadwelder's  
29 personal identification number, the Cadweld type, and the  
30 sequential number of Cadweld of that type shot by the  
31 Cadwelder. For example, Cadweld 27V45 would be the forty-  
32 fifth Cadweld of a "vertical" type shot by Cadwelder No. 27.  
33 This unique number and the identifying characteristics of  
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5 each Cadweld were entered in a log kept by the Cadwelder  
6 (Cadwelder material log) as well as in the Cadweld inspection  
7 book.  
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10 Q. 10 Were Cadwelds incorporated into the plant's  
11 structures immediately upon completion?  
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13 A. 10 (JBD): Not always. Sometimes the concrete  
14 placement containing the Cadwelds was delayed for a period  
15 of days or months.  
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19 Q. 11 Was that the case with the Unit 1 RCB basemat  
20 Cadwelds?  
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22 A. 11 (JBD): Yes. Those Cadwelds, numbering approxi-  
23 mately a thousand, were made on horizontal rebars which were  
24 spliced together not at their final location in the basemat  
25 but in the adjacent lay-down yard. After final inspection,  
26 those horizontal rebar structures were stored in the lay-down  
27 yard, which is an open storage area. The basemat placements  
28 were not made until several months after the Cadwelds were  
29 shot. The Cadwelds remained in the lay-down yard during  
30 that period.  
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33 Q. 12 What was the result of the Cadwelds remaining  
34 exposed to the elements for several months?  
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36 A. 12 (JBD): A number of the Cadwelds (100 to 150)  
37 had identification numbers marked on only one side of the  
38 splice. For these, weathering caused some of the identifi-  
39 cation numbers to be covered with rust and become difficult  
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5 to read; but in no instance was the number completely washed  
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7 out. The remaining Cadwelds had the identification number  
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9 marked on both sides of the splice, so there was no problem  
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11 in establishing their identity.

12 Q. 13 When was the identification difficulty discovered  
13  
14 and how was it resolved?

15 A. 13 (JBD): When the basemat placement was ready to  
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17 be made, the basemat rebar structures containing the Cadwelds  
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19 began to be picked up and placed in their ultimate location.  
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21 At that point, QC procedures required that each Cadweld be  
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23 located by means of a location schedule, or by marking its  
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25 location and drawing on a placing plan or a field sketch  
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27 quality drawing (FSQ). As other QC Inspectors and I prepared  
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29 location schedules showing the location of these Cadwelds,  
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31 we noticed that some of the identification numbers were  
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33 somewhat hard to read, either because they were covered with  
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35 rust or because they were on the underside of the Cadweld  
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37 and had to be read using a mirror. In most cases, however,  
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39 close examination revealed the correct number. In the very  
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41 few cases where identification was in doubt, we consulted  
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43 among ourselves and reached a consensus as to what the  
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45 number was. There was no instance in which the two or three  
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47 people looking at the number found themselves unable to  
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49 agree on the Cadweld's identification.  
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5 Q. 14 Did you take any action to verify the identity  
6 of the Cadwelds for which identification numbers were to  
7 some extent doubtful?  
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10 A. 14 (JBD): Yes. With the help of Construction  
11 personnel, we went back to the documentation on these Cadwelds,  
12 including the inspection records, Cadweld Material Logs and  
13 reinforcing steel cut sheets, and traced back by Cadwelder,  
14 type of Cadweld and date, those Cadwelds that could possibly  
15 be the ones that we were looking for. Then, through a  
16 process of elimination, we were able to provide positive  
17 identification of the few Cadwelds for which visual inspection  
18 had yielded ambiguous results. We were assisted in this  
19 effort by the fact that Cadwelders had shot these basemat  
20 Cadwelds as a continuous, uninterrupted operation, so the  
21 Cadwelds tended to have consecutive numbers and therefore it  
22 was relatively easy to identify Cadwelds that had been  
23 difficult to read in the field. Also, some of the Cadwelds  
24 joined rebar combinations that would only exist in a few  
25 locations in the basemat, so it was easy to identify them.  
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40 Q. 15 What degree of confidence do you have in the  
41 Cadweld locations shown in your location schedules?  
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44 A. 15 (JBD): Very high. The other QC Inspectors and  
45 I took great care to provide the most accurate identification  
46 possible of each RCB Unit 1 basemat Cadweld and to document  
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its location properly. To the best of my knowledge all of those Cadwelds were shown in the location schedules in their proper location.

Q. 16 Were the RCB Unit 1 basemat Cadwelds subjected to final inspection and tensile strength tests?

A. 16 (JBD): Yes. All the RCB Unit 1 basemat Cadwelds had passed a final inspection prior to being placed. Also, Cadweld specimens had been tensile tested as required by the procedures. Since no test failures were experienced, the sleeve and powder batches from which the Cadwelds were made are assumed to be of good quality, and the Cadwelds are expected to meet their design strength requirements.

Q. 17 Is there any reason why the precise location of those Cadwelds would now be of interest?

A. 17 (JBD): No.

Q. 18 Mr. Buckalew, what role did you play in the determination of the identity of the RCB Unit 1 basemat Cadwelds?

A. 18 (RB): At the time that I shot Cadwelds for the basemat, I entered into rebar cut sheets the identification numbers of the Cadwelds used for making the various splices. When Mr. Duke encountered some difficulty in reading the Cadweld numbers, he called upon me to assist him in identifying the Cadwelds. In addition to helping him read the

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numbers off the splices, I referred to my rebar cut sheets to facilitate identification of a few Cadwelds whose correct numbers remained in doubt.

Q. 19 Did you or Mr. Duke enter Cadweld identification numbers into location schedules or FSQ's without ascertaining that the Cadwelds' identifications and locations were accurate?

A. 19 (RB, JBD): No.

Q. 20 Mr. Duke and Mr. Buckalew, please address the allegation in Contention 2 that the identity and location of the Cadwelds in RCB Unit 1 basemat have been falsified.

A. 20 (RB, JBD): The allegation is incorrect. To the best of our knowledge, the Cadwelds indicated in FSQ's and location schedules were shown in their proper location and were properly identified. No falsification was committed in preparing the location records for those Cadwelds.

TH:10:F