

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	§	
	§	
HOUSTON LIGHTING & POWER	§	
COMPANY	§	Docket No. 50-466
	§	
(Allens Creek Nuclear	§	
Generating Station, Unit	§	
No. 1)	§	

Material Facts As To Which There Is
No Genuine Issue To Be Heard

1. The analysis of the control rod drop accident assumes the worst possible circumstances and sequence of events. Based on these assumptions, no other credible sequence of events can add positive reactivity at a faster rate. (Affidavit, pp. 2-4)

2. The maximum individual rod worth under these worst case assumptions is restricted by the operation of the Rod Pattern Control System (RPCS). (Affidavit, pp. 4-5)

3. The maximum incremental rod worth possible under the restrictions of the RPCS and technical specifications is approximately .8 percent ΔK . This calculates to a maximum of 135 calories/gram specific fuel enthalpy, or 145 calories/gram below the design limit. (Affidavit, p. 5)

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IN THE MATTER OF:)

HOUSTON LIGHTING AND POWER)
COMPANY,)
(ALLENS CREEK NUCLEAR)
GENERATING STATION,)
UNIT NO. 1))

DOCKET NO. 50-466

DEPOSITION OF:
JOHN F. DOHERTY



International Business Reporters, Inc. 160

1 through.

2 Q. So you do feel yourself in a position to
3 exercise a superior judgment?

4 A. I think there would be no reason for
5 admitting the contention unless something were
6 expected or at least some right.

7 Q. You'll have to take that up with the
8 Board.

9 A. All right.

10 Q. Let's move to your contention on rod
11 drop?

12 A. That's 24?

13 Q. Yes, sir. This is another one that's
14 been restated by the Board.

15 A. All right. Perhaps you could read that
16 to me. I don't have the Board's order with me.

17 Q. Here you are.

18 A. All right.

19 Q. Would you explain to me your
20 understanding of the relationship between rod
21 worth and peak energy yield?

22 A. Basically the -- simplistically, the
23 greater the worth of the rod the more -- what was
24 the second part?

25 Q. Peak energy yield?

1 A. Peak energy yield?

2 Q. Yes.

3 A. If the time is constant, then the rod
4 drop worth will be in direct relation to the peak
5 whatever you said. I missed it.

6 Q. Peak energy yield?

7 A. Peak energy yield.

8 Q. So that you have a rod of maximum worth
9 in the core that will generate a specific peak
10 energy yield and no more, since there's a direct
11 one to one correlation; is that your under-
12 standing?

13 A. My understanding is that if the rods
14 move at the same speed --

15 Q. We're talking about a drop rod.

16 A. All right.

17 Q. So that acceleration of the rod will be
18 32 --

19 A. If you get a drop exactly fitting that
20 dropping against the velocity limit and --

21 Q. Well, I wasn't speaking as to the actual
22 velocity. I was talking about the acceleration
23 that was trying to force the rod down against
24 resistant forces. That acceleration of gravity
25 32.2.

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A. Okay.

Q. So that it can only go so fast.

A. All right.

Q. Any drop rod is going to go only so fast.

A. Right.

Q. So, I was asking if your understanding was that if you have a rod of maximum worth, that that will produce a certain calculable peak energy yield on a direction one to one correlation?

A. The last part bothers me a little bit. I suppose the answer is yes.

Q. Let me state it backwards. Is it possible to limit rod worth so that the maximum rod worth cannot produce a peak energy yield greater than the design limit?

A. I'm not sure.

Q. Then on what do you base your conclusion that it is possible to have a drop rod which will exceed 200 calories per gram peak energy?

A. Well, if the underlying calculations are inadequate, then you can get that.

Q. Was this been an error in calculation or an error in the prediction of maximum rod worth as you understand it?

1 A. The resulting rod worth could be in
2 error.

3 C. Let me try it again.

4 A. Any of those can be an error.

5 Q. Let's say that CE predicts and provides
6 that it's maximum rod worth will be one percent
7 any time over core life, and that dropping this
8 rod will then produce a peak energy yield of 200
9 calories per gram. I don't attest to either of
10 these two figures. I'm just assuming.

11 Is your contention concerned with the
12 calculation which translates the one percent to
13 200 calories per gram, or is your contention
14 concerned with the fact that CE has asserted that
15 the maximum rod worth is one percent?

16 A. Well, they ought to be able to figure
17 out what percentage they got. So I think it's
18 the first part.

19 C. The first part being that you believe
20 that CE has incorrectly calculated or predicted
21 the consequence of a maximum rod worth of one
22 percent dropping?

23 A. Yes. They incorrectly predicted the
24 consequences.

25 C. All right. So that they have

1 established the maximum rod worth, but they are
2 incorrect about their conclusions as to the peak
3 energy yield which results from dropping that rod,
4 and that's the contention?

5 A. No. I'm afraid not. I hate to
6 frustrate you. I know you're upset about it.

7 Q. All right. What is the contention?

8 A. Both.

9 Q. Do you contend that General Electric has
10 not predicted the rod of maximum worth and,
11 furthermore, even if they were were so dumb lucky
12 to predict the rod maximum worth, they can't
13 predict, from what you base your conclusion on,
14 that GE has not predicted the rod of maximum
15 worth?

16 A. On the data given me by Mr. Webb where
17 he cited the data supplied on the Montague
18 nuclear plant.

19 Q. This again is in his book?

20 A. Yes.

21 Q. Can you give me a chapter --

22 A. Not really. But with a little looking
23 around, I could get to it.

24 Q. That's all right. If it's in there,
25 that's fine. This is his Accident Hazard book?

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A. Yes.

Q. Is there anything else that you have that states GE has not properly predicted maximum rod worth?

A. No. I don't have any reference that specifically states that.

Q. All right. That's your sole basis there. Now about the part which says that given a maximum rod worth, GE has miscalculated the peak energy yield? What do you base that conclusion on?

A. The same source.

Q. This is Mr. Webb's book?

A. Yes.

Q. Is that the only source of that conclusion as well?

A. Yes.

Q. Have you examined applicant's analysis of the rod drop accident?

A. I'm pretty sure I have.

Q. You have examined that analysis?

A. Yes.

Q. Can you point to me the part where (A) the rod of maximum worth has been overlooked, and --

A. No.

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Q. There's no indentifiable part in there where that occurs?

A. At this time, I don't have anything to show you that.

Q. But you know it exists in there?

A. Yes.

Q. Based on Mr. Webb's book?

A. Yes.

Q. Which predated this analysis by how many years do you think?

A. One.

Q. One?

A. Yes.

Q. How did you decide that there was a year separation between them?

A. Well, my understanding and memory and perhaps not perfect, but I thought Mr. Webb's book came out in '76, and the PSAR is amended up to 1977 here. It appears to have been --

Q. At least a year?

A. Yes.

Q. All right.

A. It appears that way.

Q. Does the same hold true for the second portion of the errors that is the miscalculation

1 of peak energy yield given a rod worth?

2 A. Yes.

3 Q. You don't have an indentifiable portion,
4 but you believe it's in there?

5 A. That's right.

6 Q. All right. What rod worth would you
7 need to drop to produce an energy deposition of
8 200 calories per gram or greater?

9 A. I think .7 percent.

10 Q. Where did you get .7 percent?

11 A. That would exceed the -- that would
12 exceed the percentage of neutrons in the
13 fissioning which would be sufficient to insert
14 reactivity.

15 Q. Excuse me.

16 A. Surely.

17 Q. You say that any rod worth greater than
18 .7 percent will produce energy depositions
19 greater than 200 calories per gram?

20 A. Didn't you say 200 a minute ago or 200?

21 Q. I believe the limit is 200. I may have
22 missspe -

23 A. I believe you'll exceed the limit with
24 that.

25 Q. The basis for that conclusion is --

1 A. Mr. Webb's book.

2 Q. -- Mr. Webb's book again. That's the
3 sole basis?

4 A. Yes.

5 Q. All right. Have you spoken to Mr. Webb
6 about testifying in this proceeding?

7 A. Yes. I think it would be fair to say
8 that.

9 Q. Did he indicate any interest about that?

10 A. No.

11 Q. You do not now --

12 A. I don't think he will take the stand and
13 testify.

14 Q. He's a wise is man.

15 A. Say again?

16 Q. Never mind. We've agreed that -- well,
17 I shouldn't say that. You've testified that a
18 rod of .7 percent or greater will exceed 200
19 calories per gram.

20 Do you believe that a rod of this worth
21 will exist in ACNCS core at any time over the
22 core life?

23 A. Yes.

24 Q. What's the basis for that conclusion?

25 A. The bypassed rods --

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Q. Pardon me?

A. Bypassed rods -- rods bypassed by RCIS system.

Q. How do you bypass a rod in the RCIS system?

A. You put it in the closed position.

Q. I'm sorry. You put what in the closed position?

A. The control rod in the fully -- one notch beyond the fully inserted position. You leave it there and/or park it there as they say.

Q. You're saying that any rod one notch beyond fully inserted will give you a rod worth of .7 percent or greater?

A. Depending on the condition or the insertion of the other rods.

Q. What does that have to do with bypassing the RCIS?

A. Well, essentially it's to describe the situation whereby the reactors at low power, the rods are mostly inserted and one is dropped from the full in position.

Q. Well, I can understand that scenario. But what does that have to do with bypassing which intimates some unauthorized operation of

1 the system?

2 A. The term I used is perhaps -- I think
3 that's the term they used.

4 Q. Who is they?

5 A. I've seen it used in my reading of --
6 well, it's part of contention 12 which I don't
7 have with me.

8 Q. Your contention 17 is --

9 A. On RFCS.

10 Q. So you believe that it is possible to
11 manipulate the RFCS system and produce a rod of
12 sufficient worth to exceed designed peak energy
13 use?

14 A. Yes.

15 Q. Is it necessary to manipulate the RFCS
16 system to get this rod worth?

17 A. I'm not certain that's the only way you
18 can do it or not.

19 Q. Is it your understanding that the RFCS
20 system exists to assure that rod worth maximums
21 are not exceeded?

22 A. Yes.

23 Q. So that coincides with your belief that
24 you have to alter or somehow fail the function of
25 the RFCS to produce this excessive rod worth?

1 A. Yes. That would be sufficient.

2 Q. So that your dropped rod and RECS picked
3 up at the same point or coincide?

4 A. They tend to coincide there, yes.

5 Q. All right. Tell me this, since we have
6 presaged that contention: your belief that the
7 RECS system can be so manipulated, does that also
8 spring from Mr. Webb's book like this --

9 A. No. I don't think he mentions that. If
10 you're interested, I think it's the book called
11 "Nugget File."

12 Q. We'll get to that contention in a little
13 while.

14 A. Okay.

15 Q. Let me see if I can summarize where we
16 are on this contention.

17 You believe that it is possible to
18 manipulate the RECS system and produce a rod of
19 maximum worth greater than that accounted for by
20 General Electric, and that dropping this rod will
21 then exceed 200 calories per gram contrary to the
22 calculations performed by General Electric?

23 A. Yes, sir.

24 Q. All right. Let me try one other thing.
25 I believe that the only references we've made to

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a factual basis is Mr. Lebb's book?

A. Yes.

Q. I didn't want to overlook anything.

A. Yes.

Q. Okay.

A. I'm prepared to stay quite late, if that's your wish.

Q. Let me see how many more we have.

A. Probably quite a lot.

MR. FIDDLE: Cfr the record.

(WIFFEUPON, there was a discussion held off the record.)

MR. FIDDLE: Let's take a break.

(Short Recess)

Q. (By Mr. Fiddle) All right. Let's discuss your contention on red pattern control system which is your number 12.

Do you know for a fact that Dresden III has an RPCS system identical to that designed for ACNCS?

A. Do you want to give her anything?