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) Following a postulated loss-of-cool accident (LOCA) Mark III drywell pressure is increased by escaping reactor steam and a steam/air mixture is directed to the Suppression Pool through the horizontal vents which connect the drywell and the containment. The drywell air forms large bubbles which expand and depressurize causing an upper displacement of water in the Suppression Pool. When the bubble breaks through the pool water surface a froth is formed. This entire phenomenon is referred to as "pool swell." (Stancavage Affidavit pp. 2-3)

(2) As part of its Mark III test program, General Electric has engaged in an intensive experimental and analytical effort, including more than fifty full-scale and

sub-scale experiments over a period of 5 years, to determine the loads on structures and equipment above the Suppression Pool. (Stancavage Affidavit pp. 3-7).

(3) The General Electric and other tests have shown that the worst case event which initiates pool swell is the design basis LOCA event; safety relief valve actuation does not cause pool swell. (Stancavage Affidavit p. 3).

(4) The pool swell phenomenon occurs in two phases; "bulk" pool swell, followed by a "froth" pool swell. Bulk pool swell imparts both an impact load and a drag load on exposed structures and equipment while the froth stage imparts only a drag load. (Stancavage Affidavit p. 7).

(5) The Control Rod Drive Hydraulic Control Units (HCUs) will be located on platforms above the maximum lift height of the worst case Suppression Pool swell. Therefore, these units will not experience a direct "impact" load from the rising water slug. The HCUs will be conservatively designed to withstand the less severe "drag" loads produced when escaping air bubbles break through the water surface. (Stancavage Affidavit pp. 8-10; Sullivan and Cheng Affidavit pp. 2-3)

(6) The transversing in-core probe (TIP) station will be located on a concrete structure cantilevering outward from the drywell wall at an elevation approximately six feet above

the normal Suppression Pool surface. Because the TIP platform design includes a sloped bottom, this structure will not experience a direct impact load. In any event, the TIP performs no safety function and its postulated loss has no safety significance. (Stancavage Affidavit pp. 10-11; Sullivan and Cheng Affidavit p. 3)

79-1743C
DSH

Doherty Contention No. 5/
Suppression Pool Swell

COST $ _____
PAID BY PLF. DEF.

UNITED STATES OF AMERICA

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF:
HOUSTON LIGHTING AND
POWER COMPANY, (ALLENS
CREEK NUCLEAR GENERATING
STATION, UNIT 1)

Docket No. 50-466

DEPOSITION OF:

JOHN F. DOHERTY

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consequences listed in B, C and D of your contention? Is that where you are right now?

A. Yes.

Q. Thank you. Let's move on to pool swell.

A. Thank you for that.

Q. Would you describe for me what you understand to be suppression pool uplift?

A. When the pressure is released through the safety relief valve to the suppression pool, there is a pushing up and outward of the water in that pool. Some of it is up, uplift is the word I've seen used and I used here, describing that.

Q. So for purposes of this contention, you are talking about a dynamic effect on the pool caused by the lifting of safety relief valves?

A. Yes, I think that's right.

Q. How high is this pool uplifting?

A. I've been trying to find that out.

Q. I gather from your answer, you don't know how high it goes?

A. You can only sort of estimate from the drawings here a little bit. I'd like to get an exact amount.

Q. What is your estimation of the height above the top of the pool?

A. It looks like it would be something of the order of 20 or 25 feet.

Q. What is the source of your estimate of how high the uplift will go?

A. Just looking at these drawings.

Q. And would you tell me what that drawing is?

A. PSAR Figure 1.2-8.

Q. Where is it indicated on there the height of suppression pool uplift?

A. It's not. I think it should be corrected, there seems to be two numbers. It's also Figure 2.2-2, Sheet 1.

Q. Is there anything on that drawing that you have there that indicates the height of suppression pool uplift?

A. No, there's nothing there.

Q. Then, how did you estimate the height of suppression pool uplift using that figure?

A. I just took a guess looking at the figure.

Q. You just looked at the figure and then guessed as to how high it would go?

A. Yes.

Q. So the whole of your contention about

influencing certain components is based on your guess of how high suppression pool uplift will go by looking at that PSAR figure?

A. In the case of Allens Creek, yes, right now.

Q. What loading will be exerted when the pool reaches its maximum height that you have guessed at?

A. By loading, do you mean type of force would be applied?

Q. Yes.

A. That, I can't tell.

Q. Have you guessed at the load as well as the suppression pool height?

A. No, I haven't even taken a guess.

Q. So you ventured to guess at the height, but you have not guessed at the force?

A. Right.

Q. Then, what is the basis of your contention here that these two mechanisms are susceptible to damage by suppression pool uplift?

A. Well, it appears that some amount of water would rise to that point.

Q. It appears that some water will rise to that point?

A. Yes, estimating.

Q. What makes you imply that water will reach that height? I thought we established it was based on a guess.

A. That's right, we did.

Q. So you have guessed as to the height. You have no guess as to the load and that leads you to the third guess that there will be some damage to these components?

A. A moment ago, you asked me for the loading which implied some type of force answer. I have only a rough estimate, not in numbers, but just in terms of experience that it looks as if the large amount of water will rise upward and strike the parts mentioned in the contention.

Q. Well, let's make sure we're very clear about our terms here, Mr. Doherty. Do you have an estimate or do you have a guess as to a load being exerted on these components from pool swell?

A. What is an estimate to you, sir?

Q. An estimate is some figure that has a rational basis. A guess is a hunch or a figure that has no rational basis. Now, which of those is pertinent to your contention here?

A. What is a figure to you?

Q. A number.

A. No, then it has to be B, guess, I have no number.

Q. So this whole contention is then a guess?

A. You may label it as you like.

Q. You have no knowledge as to the height of the suppression pool uplift?

A. At this point, I do not, that's right.

Q. You have no knowledge as to the load that will be exerted by the suppression pool uplift?

A. That's right.

Q. You have no knowledge as to the ability of these components to withstand that load?

A. That's right.

Q. You have no knowledge as to the ability of the floors within the containment to withstand that load?

A. There are documents -- there is a document NUREG 0474 which indicates that the things that I have expressed may occur.

Q. Would you show me those passages in 0474?

A. I don't have 0474 with me. However in my response to your interrogatories, I believe there is something.

Q. What is that something that's in your response?

A. All right. In answer to your question, B-2.

Q. What about the answer? Well, is this contention based on information contained in NUREG 0474?

A. Some of it is.

Q. What portion is not?

A. I had to take some information from the plans for Allens Creek in order to locate what items in the reactor building might be subject to the loading of suppression pool uplift.

Q. What information did you take from the plans of Allens Creek to use in conjunction with NUREG 0474?

A. The location of those items.

Q. The location of the control rod drive mechanism, hydraulic unit and of the tranversing end core probe?

A. Yes.

Q. That's the only information you took that is Allens Creek specific for this contention?

A. Yes.

Q. Does NUREG 0474 indicate the height of

pool swell?

A. Not for this unit, to my knowledge, not for Gessar 238.

Q. Does it indicate what force or load might be exerted by the pool swell?

A. No, it doesn't right at the moment that to my knowledge.

Q. Then, if the only information you have is the location of these two named components and NUREG 0474 says nothing as to the height or load of suppression pool uplift, what is the basis for your contention that suppression pool uplift may in fact affect these components?

A. The previous GE units have had this cited as one of their problems.

Q. Which units?

A. Mark I and Mark II units have.

Q. Is it your understanding that Mark I and Mark II units are identical for these purposes for the Mark III design for Allens Creek?

A. No.

Q. Are they in any way similar?

A. That I'm not certain.

Q. You do not understand the differences between a Mark I, a Mark II and a Mark III

suppression pool?

A. As related to this very detailed point, no.

Q. Then, how can you base a contention on a Mark III suppression pool uplift to other different systems that you have no knowledge of?

A. Part of it's in the contention answer that no full scale tests have been done to guard against the possibility.

Q. What part of the answer is in that statement?

A. What part of the answer? It's in the contention --

Q. Now, you said that the answer to my question about how you could base this contention on two completely different systems that you have no knowledge of and you said, part of the answer was the statement in the contention that no full scale tests have been performed and I asked you what part of that answer was in that statement?

A. Well, evidently, I was moving ahead instead of replying to your question. What I am saying is that Mark I and Mark II plans have had these problems and as an intervenor, I see no proof that Mark III will escape these problems.

Q. As an intervenor, do you see any information at all which will indicate that the problems, whatever they were at Mark I and Mark II, will also occur in a Mark III plant?

A. Apparently they were, I'm not certain they have been corrected.

Q. Apparently what was?

A. That the danger of pool swell uplift was a problem.

Q. For the Mark III?

A. Yes.

Q. What gave you that indication?

A. I'm trying to locate the exact site now.

Q. What are you looking at to locate that exact site?

A. A book called "The Silent Bomb".

Q. "The Silent Bomb"?

A. Yes.

Q. B-O-M-B?

A. Yes.

Q. Did you find what you were looking for?

A. Not exactly, I was looking for a quotation by a man named Dragoohm as who was employed by Potomac Electric Power.

Q. Well, maybe I can expedite things, Mr.

Doherty.

A. Yes, I'm sorry to take so long.

Q. Am I correct in assuming that the only basis for your contention is NUREG 0474, whatever facts are contained in there pertinent to this contention and this book, "The Silent Bomb"?

A. No, I think there's testimony by the General Electric engineers named Minor, Bridenbaugh and Hubbard in 1976 as well.

Q. What did they say in their testimony?

A. That suppression pool swell was a problem for the Mark III system.

Q. What did they base that conclusion on?

A. At the moment, I don't know.

MR. NEWMAN: You said they identified the problem. What was the nature of the problem they identified.

A. That in the event of blow-down, the water in a Mark III containment system would rise and load on safety components in the reactor building.

MR. NEWMAN: Did they specify tip system, T-I-P?

A. No, I don't believe they did, but I'm not certain. I just don't believe so.

Q. (BY MR. BIDDLE): Then, am I correct, Mr. Doherty in assuming that the only basis for your contention is whatever facts that are relevant are contained in NUREG 0474, the book "The Silent Bomb" and the testimony by the GE engineers?

A. Yes, for the time being, yes.

Q. That is the basis of your contention now?

A. Seems to me that's where I located almost all the material that went into this.

Q. You have no other facts to support this contention; is that true?

A. I need to refresh my memory a minute. Also, do you want to go back on or -- in addition, there is a memorandum which I have received from the Union of Concern Scientist that is essentially a part of at least the document from Dr. Stephen Hanour, then of the AEC, dated September 20th, 1972 which does mention a tendency of overcrowding and limitation of access to reactor and primary system components for surveillance and in-service testing.

Q. What has that got to do with suppression pool uplift?

A. The fact that the reactor containment building has been reduced in size because of the

use of the pressure suppression system.

Q. What has that got to do with the loadings exerted by suppression pool uplift?

A. This says that at the moment, the type of system has the problem of overcrowding and limitation of access and --

Q. That reference there is to the Mark III system?

A. I believe it is, yes.

Q. Does this have anything to do with loadings exerted by suppression pool uplift?

A. Yes, it does.

Q. What?

A. Because it says that since these devices have to be placed somewhere, they have been crowded near the top of the pressure suppression pool --

Q. Where does it say they have been crowded near the top of the suppression pool?

A. All right, it doesn't say that, but it does say --

Q. You just told me that it did say that.

A. That's right. All right. I say that.

Q. Is there anything in that document that you're reading from there now make any reference

to suppression pool uplift loadings? Did you understand my last question?

A. Yes, sir.

Q. Could you answer then this question, Mr. Doherty. Are the words suppression pool uplift ever used in that document you were just reading?

A. I didn't see them in looking through it just now, Mr. Biddle.

Q. Would you tell me what the tranversing end core probe system is?

A. Oh, I think it's an information system, sort of like a mobile, sort of like a mobile LOCA power range monitor. It can be moved around.

Q. So this system is used to measure neutron flux when the reactor is operating and is capable of moving about the core; is that your understanding.

Q. That's my understanding of it, yeah.

Q. Could you describe it physically?

A. No.

Q. Do you know where it's located?

A. Part of it. Part of it is located in the containment building near the concrete, apparently that's concrete support for the reactor vessel.

Q. Can you tell me what elevation that is?

A. 145 feet, 145 feet and three inches I guess is the way that could be read.

Q. Is this the component you're concerned about in your contention as experiencing a load from suppression pool uplift?

A. Yes, that's one of them.

Q. That is the tranversing end core probe that you reference in your contention located at elevation 145 feet, roughly?

A. Yeah, that's the one. The drive units are located somewhere between 142 and a half feet and 145 feet three inches. At the appear to be 142, well, let's say 143 feet.

Q. So I understand you to say that you're concerned about the impact on these two components, both of which are above elevation approximately 143 feet.

A. The bottom of one appears to be 143 feet from sea level.

Q. So the answer to my question is yes?

A. Yes.

Q. Can you tell me the role of the tranversing end core probe system in preventing accidents?

A. It would provide away of getting information about the reactor core.

Q. During normal operation?

A. During normal or accident operation.

Q. Can you describe for me the role of the tranversing end core probe system in mitigating accidents?

A. It's not an accident mitigator by itself.

Q. It is used only in preventing accidents?

A. No, it could be used for any of a number of other reasons.

Q. What are the other reasons it's used?

A. I'm not aware of all the reasons anyone might use a traversing end core probe.

Q. Why are you concerned about the traversing end core probe being damaged?

A. Well, I don't think it's there for fun. It must have some use.

Q. Do you know what use it is?

A. It does give information as I described earlier and that must be of some importance or it wouldn't be there.

Q. Does it have any importance to you or are you just relying on the fact that it is installed?

A. I think when people decide safety equipment like this is needed, that I'm concerned.

Q. So you have no direct knowledge of its importance; you're relying only on the fact that it is, in fact, installed?

A. I think I indicated earlier that it was used to give information about LOCA conditions in the core and that is some information I have.

Q. And that is the basis of your concern that it might be damaged is that you will lose this information in the core?

A. Yes.

Q. Can you describe for me the function of the control rod drive mechanism, hydraulic units?

A. Only that it appears to be an important part of the entire control rod mechanism.

Q. Why does it appear to you to be an important part?

A. It appears to be -- control rod drive unit, the control rods are essential for controlling the reactor.

Q. Well, that might be an answer to another question, but mine was: What is the importance or the function of the control rod drive mechanism, hydraulic unit?

A. I don't know the exact function of it, but it appears to be significant to the movement of control rods.

Q. What gives that appearance?

A. Drive.

Q. What gives that appearance?

A. Drive, the word drive.

Q. Oh, the word drive in the name drive?

A. Yes.

Q. So the important to you of this contention as to these components is the fact that the word drive is included in the name, control rod drive mechanism, hydraulic unit?

A. That's part of it. Control rod is important, the whole term is important.

Q. So you derive all of the importance of these components in this contention from the label?

A. That's an odd question. I just wouldn't say all, but that's important. I think I need to know a little bit more about what the control rod drive mechanism does in order to discuss the contentions sensibly at the hearing.

Q. My question to you was exactly that. Would you tell me what you understand to be the

function of the control rod drive mechanism hydraulic unit?

A. At the moment, I don't understand its function.

Q. And therefore, the only importance you attach to it is that derived from the words used in the label, control rod drive mechanism, hydraulic unit; is that correct?

A. All right, that's correct.

Q. I'd like to recap briefly, is it my understanding that you do not know what load will be exerted by suppression pool uplift on the floor which supports either the tranversing end core probe or the control rod drive mechanism, hydraulic units?

A. Yes, I think that was my answer to question B-2 in your interrogatories.

Q. Do you know what the design loading for those floors are?

A. Not at the moment.

Q. Do you contend that these floors cannot absorb the impact of suppression pool swell uplift, whatever that might be?

A. Yes, at the moment.

Q. What is the basis for that contention?

A. That under previous books that I've indicated to you, that there was a problem along this line and if the floor was sufficient, there wouldn't have been a problem.

Q. Did you identify any problems other than those experienced, supposedly experienced in the Mark I and the Mark II?

A. Say again?

Q. Did you identify any problems other than those supposedly experienced by the Mark I and Mark II systems?

A. I haven't been able to reference some of the problems about Mark III which were mentioned in this book.

Q. Which book is that?

A. Yes, let me look at the title. "Silent Bomb".

Q. Would you give me the author and the date of that book?

A. I'll do my best. All right. The date is 1977. I am trying to remember the author's name.

Q. It's not indicated on that flap edge?

A. This is just xeroxing some of the chapters, so it doesn't seem to be right handy.