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. Fuel hydriding is caused by hydrogenous contamination (primarily moisture) introduced inside the Zircaloy fuel rod during manufacture. (Affidavit, pp. 1-2)

2. Hot vacuum outgassing (drying) techniques used during manufacture, just before and during plug welding, and the presence of a hydrogen getter inside the fuel rod, have proven effective in eliminating hydriding as a fuel failure mechanism. There have been no hydride-induced failures in fuel manufacturing using the outgassing techniques and the hydrogen getter. (Affidavit, pp. 2-3)

3. Fuel densification has been studied since 1972. Quality control tests during manufacture will assure that the fuel is of such an initial density that further densification during irradiation does not adversely affect fuel performance. Conservative limits on Linear Heat Generation Rate (LHGR)

assures that actual LHGR remains within design limits if maximum theoretical densification occurs. (Affidavit, pp. 3-4).

4. No fuel cladding collapses or failures that can be attributed to densification have been experienced in any BWR fuel. (Affidavit, p. 5).

5. In the unlikely event that hydriding or densification-induced fuel failures occur, no safety concern exists since (1) operation of reactor coolant and the off-gas system can be controlled by regulating the power level of the reactor and (2) the failed fuel can be replaced if necessary. (Affidavit, p. 5).

0-272
BM:gs

McCorkle Contention No. 14/
Fuel Hydriding

COST $ _____
PAID BY PLF. DEF.

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IN THE MATTER OF:	)	
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HOUSTON LIGHTING & POWER COMPANY	)	DOCKET NO. 50-466
(ALLENS CREEK NUCLEAR GENERATING	)	
STATION, UNIT 1)	)	

DEPOSITION OF:

BRENDA McCORKLE

BRENDA McCORKLE,

called as a witness by Houston Lighting & Power Company under the adverse party rule, having been first duly sworn, testified as follows:

CROSS EXAMINATION

QUESTIONS BY MR. BIDDLE:

Q Would you state your name and address for the record?

A My name is Brenda McCorkle, and my address is 6140 Darnell, Houston, Texas 77074.

Q We have asked you here today to complete discovery on the subject matter covered in applicant's second interrogatories, specifically dealing with fuel hydriding densification, and leakage bypassing filtration systems, is that your understanding as well?

A Yes, but I have a problem with it.

Q All right.

A The problem I have with it is that I thought the hydriding contention had been dropped out.

Q You say now you want to reform it --

A No, I'm saying that in the Board order of April 12th, '79, in Paragraph 8, they said my contentions 914 and 17 were admitted.

Now, according to my calculations on the contentions I submitted, the one on hydriding is No. 16.

Q Well, we have your Contention No. 14 which reads as follows. And I quote here and you can correct any portion you want. The way we have it reading now is that, "The fuel rods to be used are not safe because of clad failures in off gas activities caused by hydriding and the effect of fuel densifications which increases the power spikes and heat generation."

A I have that listed as No. 16 under mine.

Q Which contention do you have listed under 14?

A Under 14 I have a dry well and containment issue contention.

MR. BIDDLE: Go off the record for a moment.

(Discussion off the record.)

Q Now, the Board renumbered contentions, did they not? In other words, your No. 14 may not be the No. 14 that the Board assigned that number.

A Okay. What I did was I paragraphed these, and

it started out this was -- has a one on it. This would have been Contention No. 1. Contention 2 is actually No. 3 on mine, Contention 3, and the reason I say this, back on the Board order of April 12th, '79, it said with regard to her contention 3 which contends that the construction of the plant may be excessive.

That corresponds with what I put as No. 3. By their number, then I just went on down. And I ended up with -- and I only did this today, because I was just going along with whatever you said. And I ended up with the one on the fuel rods being No. 16. And then I couldn't understand --

Q Let's see if this will correct it. We asked a set of interrogatories on fuel hydriding, densification and leakage, bypassing filtration systems.

A Right.

Q And in a Board order you were asked to more fully respond to those.

A Right.

Q And then the Board allowed us until a later date to follow up discovery. That was a Board's

order of --

A Right, I remember.

Q -- January 8th. So this deposition is in accordance with the January 8th order saying that we can follow up on your further responses.

A Okay. Well, my only question on that was if I did not -- if they just summarily dropped the -- see, I got real confusion on this because I don't know what's in and what's out. I am perfectly willing to respond as best I can.

Q I understand.

A But when I did this this morning and I came out with No. 16 on that and nowhere in the Board order does it say that 16 ends. I don't know what you're pursuing.

Q Well, I don't know where the confusion lies, but I guess the best course for us is to go ahead and complete our questions and answers on these three subject areas regardless of what contention is attached to them, and then afterwards we'll try --

A We need to clarify something for the Board.

Q -- to ascertain ourselves which are in and which are out and make use of the information in this deposition accordingly without making

any reference to whether it's admitted or what number pertains to to the admitted contentions. Okay? If that's acceptable with you.

A That is fine.

Q All right. Let me ask you first if you are an expert either in fuel hydriding, densification or in the subject area concerning leakage bypassing filtration systems?

A No.

Q Have you retained an expert witness for any of the contentions dealing with this subject matter?

A No, I havent.

Q Did you then formulate the answers that you submitted on February 1st, which was your last set of responses, by yourself without assistance?

A Yes.

Q In response to the Board's order of December 5th of 1979, you stated that you had delayed in answering a set of interrogatories because you lacked the technical knowledge to answer many of these questions and were searching for an expert witness to answer them. You then stated, and I quote, "If I cannot locate

an expert witness, then I will withdraw these latest contentions."

Is that representation you made to the Board no longer valid?

A I don't understand what you are asking.

Q All right. In a Board order of December the 5th, they asked you to answer four questions, I am sure you remember those.

A Right.

Q One of those was what were your reasons for not complying with the Board's order to you compelling you to respond to discovery, and you responded that, and I quote, "I complied with the Board's August 27th order to compel. I have not complied with the October 5th order because at that time I was working on the third set of interrogatories from applicant. I received this order (October 5th) two days before the due date for answers. I also lack the technical knowledge to answer many of these questions, and am searching for an expert witness to answer them. If I cannot locate an expert witness, then I will withdraw these later contentions."

Those answers are exactly the

subject matter that we are here to discuss today. And I am asking whether or not this representation you made to the Board that you would withdraw these contentions if you did not locate an expert witness is still valid, or do you intend to testify at the hearing yourself on these matters?

A I don't know right now. I am still looking for an expert.

Q And is it still true that if you do not find an expert that you will withdraw those contentions?

A I don't know.

Q Well, do you intend to advise the Board if you change your representation you made in this submission of --

A Oh, yes, sure.

Q -- 31 December?

A Right.

Q So right now --

A I'll put it this way: Most likely I will withdraw them if I can't find someone that knows a lot more than I do. I am not real big in making a public fool of myself.

Q Let me be forthright in the problem we are

having, these contentions are what we call the oldest contentions or the ones originally admitted. You were in that group of original intervenor .

A These are the ones admitted when we appealed.

Q We lumped those all together. In any event, the discovery on these contentions as ended December the 5th, so if things were neatly organized, there would be no further discovery on this. We are right now in a position of not knowing where your case is,that you intended to withdraw if you don't find an expert witness. And you haven't identified an expert witness, and we have no one to depose to close discovery.

A We are also in a double bind, not just because of my doing but also on what is in and what is out.

Q Well, but for present purposes --

A If I do not find an expert witness, I will withdraw these contentions.

Q And you will let us know as soon as you identify him so that we can request discovery, permission to depose him because right now the discovery on this portion of the case is indeterminate?

A The day I get him wired in.
Q Do you have any prospects right now or is that just an --
A No.
Q Until that time, we will ask you for your best knowledge of the contentions, even though you state that it's unlikely and extreme that you will testify, I think for efficiency purposes we'll work on the supposition that you might testify or at least you might cross-examine and we'd like to know what you know about the contentions, if that is all right?
A That is fine.
Q It is true that you do not intend to testify yourself?
A As an expert in this area?
Q Yes.
A Absolutely not.
Q Maybe the best way to approach this now is to ask you how did you formulate the contentions on these subject matters originally? Did someone or something identify the concern to you that we can look at and better understand the basis of your concern?
A Well, I read the material.

Q Which material?

A My contentions were formulated from reading the -- I don't know whether --

Q The Safety Evaluation Report?

A -- SAR or SER.

Q SER.

So all these subjects matters were gleaned from the SER?

A I don't know whether they came all from that. I read so much of this material, I can't tell you where anything came from.

Q So, you cannot point out to us -- to anything, particular reference?

A No, not to any particular reference, but it did come from the material that has been published, this. I have read the final environmental report and this material and we came up here one day and Mr. Copeland let us go through some of the material that was available here.

Q But you have no specific quotation to a page or chapter or number or anything like that?

A No.

Q And have no recollection of where you originally viewed the concern?

A Let me look at this.

P41 to 49. Is that the safety report or is that the condensed safety report?

Q This book here is the original Safety Evaluation Report. There were two supplements. Page 45 discusses hydriding protection, is that the source of your concern on the first subject matter?

A That was probably --

Q Have you identified any concern other than that identified in those sections of the SER?

A Well, I have one -- I didn't bring it with me but I have another one that came from the PSAR. It was just a small paragraph on the -- what is it called, on the --

Q Could you -- if you find that piece or reference, would you let me know which --

A I have it clipped to a stack of materials.

Q If you would just call me and let me know what section of the PSAR you were referring to.

Now, outside of that section of the PSAR and these sections of the SER dealing with hydriding, you know of no other source of your concern presently?

A No.

Q Would you describe for me what you believe is the problem with hydriding, briefly?

A Hydriding is when the hydrogen gets into the fuel and can cause, I guess, cladding breakdown. This has been a long time since I've looked at this.

Q So, cladding breakdown is the source of your concern in hydriding?

A Yes.

Q Do you know when this problem was originally discovered?

A No.

Q Do you know how it was originally discovered?

A No.

Q Do you know of any steps that have been implemented to alleviate this problem, whatever it's nature?

A I -- are you saying do I know of any remedial measures?

Q Yes.

A Yes. I don't know, it's not this one, it's the PSAR, and I don't know whether that's been abated or not, but it talks about they have developed a zirconium alloy pack, or it's made of zirconium. They were packed loosely

around the fuel rods sort of as a hydrogen getter to keep the hydrogen away from the cladding fuel rods.

Q Is it your contention that that remedial measure is inadequate?

A I have no notion whether that is adequate or not.

Q You have no opinion as to its adequacy?

A No.

Q Can you tell me of every instance that you are aware of where fuel manufactured by General Electric for BWR failed due to hydriding or suffered hydriding even since November, 1974, which was the issue date of the SRR?

A I don't know.

Q Do you know of any instance where it was?

A I think I have read something about it somewhere, but I don't know where it was.

Q But you have no knowledge of any instance of fuel failing after November, 1974?

A No.

Q Some of these questions are premised on answers you gave in previous interrogatories, so if you don't understand the question, just say so and I will identify for you the premise.

A All right.

Q I would say in general if I ask any question that you don't understand because of my structure or whatever, just please interrupt and I'll try to restate it for you, rather than have you try to answer something you are not fully aware of what the question is.

Let me ask you how long the hydrogen getter material must be used to get a satisfactory history as to its effectiveness? In a previous interrogatory answer you indicated that there wasn't adequate history.

A I don't know.

Q You don't have any opinion about how long we have to use it before you can say whether it's working correctly?

A No.

Q Do you know of any instances where hydrogen getter material, this remedial measure, has been depleted before the end of the life of the fuel?

A No.

Q All right.

A Now, I did read in the last, I think it was the supplement to this, it came out I believe

in March of '70.

Q '73.

A No, not that.

Q This is the last supplement.

Oh, I'm sorry, this is the one that has the wrong date on it. March '70 was the issue date. This one has the wrong date.

A It does talk about the cladding in there and it talks about the current cladding structure is supposed to before it begins to give way, it has something like a five, I think it's a five-year and I did not mark -- I have one of these but I did not mark the place where it is.

It indicated to me that the cladding structure or the hydrogen -- I don't know whether it was hydrogen getter -- is supposed to last longer than the fuel rods would usually be in use, which, if that is true, there is no problem.

Q If that is true, then there is -- then you have no further concern?

A If the hydrogen getter or the cladding structure is as this indicated, and I do not remember

exactly if that did include the hydrogen getter material, but if the cladding structure is designed to last longer than the fuel, how could you object?

Q Or if the getter material is designed to last longer?

A Yes, if its projected life is longer than the fuel.

Q Do you agree it is possible to calculate and to provide an amount of getter sufficient to capture all of the hydrogen expected over the life of the fuel? In other words, it is possible to supply enough zirconoid chips to service the fuel over the life of the fuel?

A It should be.

Q You made some reference in your interrogatory answers about a concern that the getter material might become contaminated. Could you identify for me the source of your concern and how the getter material might become contaminated?

A I don't know, I suppose it's theoretically possible that the getter material could become saturated and lose its usefulness, but

I don't know enough about that to comment on it and I do not know what else is in there, in the fuel racks and rods and cladding material that could contaminate it.

Q You have in mind no specific instance of getter contamination?

A No.

Q This is more of a theoretical argument?

A Yes.

Q Let's turn our attention now to the densification of that same general contention.

Again, I'll just start by asking you to describe briefly what you visualize as the problem with fuel densification.

A Well, the fuel becomes compacted and I don't know how it affects it to make it more or less deficient than it was before or because the power spikes -- I do not remember. I was reading this this morning in the same book and they were talking about the fuel pellet arrangement now is such that it's minimized fuel densification problems.

Q If the information contained in this SER supplement is correct, the NRC staff's evaluation of fuel densification problems principally, if

that is correct, does that remove the source of your concern?

A Probably. I have to get a lot more education on this before I can give you an educated answer.

Q But you understand our problem is trying to rebut your questions?

A What you are trying to do is blow me out of the water and you and I both know it.

Q We are trying to understand the basis of your concern, what we have now is some generalized statements like densification is a problem and the starting places --

A I will say that the March '79 supplement to the Safety and Evaluation report says that they have taken care of the fuel densification problems by creating a new pellet structure or they are using smaller sized pellets.

Q I understand. The General Electric proposed and implemented a remedial measure for the fuel densification phenomenon and the NRC staff found that remedial action acceptable and now I am prompted to ask you whether or not you also find it acceptable or if you have a continuing objection, and if you do have

a continuing objection, can you identify it for me specific enough so we can attempt to rebut it?

A No, I can't identify specific objection. This material on the new pellet shape and cladding is on Page 4-3.

Q 4-3 of the SER Supplement?

A Yes.

Q But you have no particular opinion or reason to object or agree with the staff's evaluation here?

A No. But the staff says it's going to work, it's an exercise in futility for me to object to it anyway. If it's acceptable to NRC.

Q Well, the way I read this section of the SER, that is what they say.

A That's the way I read it, too.

Q They said it's acceptable, so presently the only person objecting to it, to our knowledge, is yourself, and we need to know what your objections are.

A If it's going to be acceptable to them, I have no objection, I don't care.

Q So --

A I just read this this morning, just sat down.

Q So you have no continuing objection concerning the problem of fuel densification?

A Say that again.

Q Well -- I don't want to put words in your mouth.

A If this is correct, how unusual for you and Mr. Copeland to try to constantly put words in my mouth.

If this is correct, I have no further objection.

Q Okay. I have remaining a series of questions based on prior interrogatory answers that you gave us dealing with fission rates and the size or the substantiality of power spikes and so forth and so on. I assume that these answers were written before you reviewed this material in the SNR. I am wondering if I need to ask you these questions based on those prior answers or is your position now centered solely around the adequacy of the evaluation of the SNR supplement, in that you don't have -- necessarily take any exception to that?

A I don't take any exception to the material in that.

Q I don't see any reason to ask any more on

that, then.

Okay. Turning to the last area that has to do with excessive leakage bypassing filtration systems, and I have again an introductory very broad question that I am forced to ask really. What leakage bypassing filtration system are you talking about? We can't pinpoint the structure or systems that you have reference to.

A Which interrogatory are you talking about?

Q That would be your interrogatory, the way I have it numbered, 17. I will read it the way I have it recorded. It says the containment as designed will allow excessive leakage to bypass the filtration system, power company admits that 20 percent of the leakage would not even be filtered and also the filter absorber, I think meant adsorber, may start a fire by auto ignition, if there is no water supplied by such auto ignition as required by the NRC regulation guide 1.52. That is the contention.

A I have that one down as my number 19.

Q Well, we'll straighten the numbering out later. But could you describe for me now what leakage