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)	§	

STATEMENT OF MATERIAL FACTS
AS TO WHICH THERE IS NO GENUINE
ISSUE TO BE HEARD FOR
DOHERTY CONTENTION 44

(1) Virtually all of the piping in the feedwater, steam supply, residual heat removal, ECCS, containment spray and service water systems will be made of low carbon stainless steel or plain carbon steel, both of which are not susceptible to integranular stress corrosion cracking. Small segments of open-ended piping in direct contact with the Supression Pool will be made of stainless steel with a slightly higher carbon content. However, this piping will not be subject to the same stress levels as the pressurized piping in which IGSCC has been observed. (Affidavit, pp. 2-3).

(2) The ACNGS will use conservative design practices in accounting for water hammer forces, and will incorporate applicable NRC guidance into fluid system designs as it becomes available. (Affidavit, pp. 3-4).

(3) The ACNGS fluid systems will be designed to eliminate or minimize water hammer. Those systems which have a potential for water hammer will be designed to accommodate the associated loadings. These additional design measures all address areas of concern identified by the NRC Staff in NUREG-0582. (Affidavit, pp. 4-7).

79-1743C
DSH

COST $ _____
PAID BY PLF. DEF.

Doherty Contention No. 44/
IGSCC and Water Hammer

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NUCLEAR REGULATORY COMMISSION

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

JOHN F. DOHERTY

International Court Reporters, Inc.
917 Bank of the Southwest Building • Houston, Texas 77002 • (713) 652-5911

General Electric took to reg. guide 1.54?

A. Yes, and that was stated in the earlier reference that I gave you.

MR. NEWMAN: If it were to be established that none of the compounds identified in your contention 43 are used to clean or coat stainless steel components at Allens Creek, would that then moot your contention?

A. Well, the contention lists some elements and some, I've forgotten the term for that, some salts, I guess, but Mr. Newman, if those were removed, yes, that would remove the basis.

Q. (BY MR. BIDDLE): Would you turn to your contention 44?

A. Incidentally, I'm not an expert on cleaning compounds. 44?

Q. Yes. What is water hammer?

A. My understanding of it is that it's a force that emerges when steam condenses in piping that normally carries steam and then in some way is moved. In other words, water sitting in a pipe and the pipe is meant to carry steam and it can move as water in the event the system starts operating, that pipe starts in use.

If the pipe were sitting idle, for

example, it would then cause this water to move and it strikes a part causing a noise and it's called water hammer.

Q. So water hammer is a nuisance as to noise?

A. It can hit with enough force that in the contention, what I've said that is in the event the pipes are cracked, the force might be sufficient to break them open.

Q. Well, what is the force imparted to the water that's lying in these pipes?

A. Well, it might be an additional -- it might be a force of air moving behind it, pushing it forward. That would be one very common one. The moving air is behind the water, so what actually strikes at the weakened place is water which hits with appreciably harder force than steam.

Q. So is it your contention that there are pipes at Allens Creek that contain a small amount of water so that they are for practical purposes, empty and that this water can somehow be motivated by the introduction of air with sufficient force to cause problems?

A. Yes, broadly, that sounds about right.

Q. What causes the air to be in motion?

A. There might be any number of reasons in which that system might have some material such as steam or air driven through it or some emergency purpose or some testing purpose or --

Q. Would you identify the systems in Allens Creek where these motive forces will be introduced into partially filled pipes?

A. Well, NUREG 0582, pages 2.2 and 2.3 state and I believe this is a summary statement, on the basis of reactor operating experience, the most serious water hammer concerned are pump start-ups with inadvertently avoided lines in the emergency core cooling system and residual heat removal system.

Q. So those are the two systems of concern in your contention?

A. No, there is an additional one. And main feed water line transients caused by flow control valves.

Q. So the three systems of concern in your contention for Allens Creek are --

A. Those are the three major concern.

Q. ECCS, RHR and main feed water?

A. Yes.

Q. It is these systems you contend are susceptible to water hammer forces?

A. Yes.

Q. Would you describe the cracking that occurred at Dwayne Arnold has reference in your contention?

A. I' . do my best. As I understood these cracks, they were sort of in the shape of this, a U-shape. They were not longitudinal, but rather around, imagine a horizontal pipe, they were sort of shaped semicircular going around the pipe, rather than down the pipe.

Q. What caused these cracks?

A. I'm not certain what's caused them.

Q. What leads you to believe that these similar cracks can occur at Allens Creek?

A. Well, first of all, nuclear plants are constructed with materials that are as least likely to crack as possible and that goes for the Dwayne Arnold plant. Allens Creek probably is based on materials that may represent an improvement or may not.

Q. Is it your contention that Allens Creek will have incorporated into its pipes, the material which cracked at Dwayne Arnold?

A. No, but it's my contention that the possibility of pipe cracking will be required, it will be required to deal with it simply because they have never created a crackproof pipe.

Q. What is the basis of the assertion that they have never invented a crackproof pipe?

A. It's never been a announced happily as it would be if it were invented.

Q. Where are you looking for the announcement?

A. Particularly in NRC publications.

Q. Your sole basis for contending that Allens Creek will experience cracks is the fact that they experienced cracks at Dwayne Arnold?

A. No, that also the NRC will require that accidents be analyzed for pipe cracking and pipe breaking and that if a pipe could not crack or break, they would not require that.

Q. What is your basis for that statement?

A. What is that?

Q. Your last statement? Would you like it read back to you?

A. Yes, that would be all right.

(The answer was read back by the

reporter.)

Q. Someone at the NRC tell you that to be true?

A. No, but I think common sense would tell you, don't analyze something that can't happen.

Q. So the sole basis for your assertion that cracks will occur at Allens Creek is the fact that a the staff has required analysis assuming that pipes will break?

A. There is a good deal of expensive research financed by the NRC on pipe cracks and on metallurgy to prevent pipe crack.

Q. What is the basis of your assertion that that research has not been successful?

A. The fact that it's still ongoing indicates that it's not finished.

Q. So the basis for your assertion that there will be cracks at Allens Creek is the fact that there is continuing research into pipe cracks?

A. Yes.

Q. And that's your sole basis for asserting that?

A. The fact that other plants have

experienced cracking, also.

Q. More specifically, the fact that there were cracks at Dwayne Arnold?

A. Cracks at Dwayne Arnold or are the outstanding example.

Q. What similarities exist between the materials that cracked at Dwayne Arnold and the materials used in the design of Allens Creek?

A. Well, I don't know that.

Q. So you have no real basis for making a correlation between the cracks at Dwayne Arnold and the cracks at Allens Creek?

A. At this time, I don't have the specific information to tell you precisely the material that has cracked at Dwayne Arnold, so that if I go to the record of Allens Creek, I can't tell you, this is exactly the same material. Therefore, I cannot tell you.

Q. If they were of much different materials than the the fact that there were cracks at Dwayne Arnold would say nothing about the ability of the material used for Allens Creek to resist cracks, would it?

A. Yes. Well, that would depend on what "much difference" would have been.

Q. But you don't know what the design is for either of those plants, so you're not in a position to make any judgment as to whether they are similar or different?

A. I'm in a reasonable position to judge they are similar, because the pipes have to do similar tasks.

Q. Is susceptibility to cracking solely a function of the TASC they have to perform or is it a function of the metal from which they are composed?

A. It's not solely a function of the TASC that is performed.

Q. Is it a function they are to perform?

A. Somewhat.

Q. And to what degree?

A. If the temperature and pressure that the pipes are subjected to are similar and the flow, the amount of material that must move through them, then they are similar.

Q. So you're contending that because Allens Creek has pipes which will experience the same pressure and temperature environments as those that cracked at Dwayne Arnold, Allens Creek's pipes will crack?

A. Allens Creek's pipes have the same difficulties to overcome. In fact, Allens Creek's may even be greater in view of the larger capacity of Allens Creek's than Dwayne Arnold. Allens Creek's pipes will carry more flow, more material.

Q. So you are contending that the reason you assert that Allens Creek pipes will crack is because they will experience the same or greater or more adverse temperature, pressure and flow environments; is that correct?

A. As far as I know, they will not experience greater temperature. I think they will experience a greater amount of water flow, many of them for the component that they are and that would mean that some pipes will carry more than any pipe at Dwayne Arnold.

Q. So you have put together the fact that there was a crack at Dwayne Arnold and the fact that flow rates at Allens Creek will be greater than that experienced at Dwayne Arnold and conclude that the cracks at Dwayne Arnold will also occur at Allens Creek?

A. There would be similar cracks, it's my belief.

Q. Similar cracks will occur because of the greater flow rates at Allens Creek, is that your contention?

A. No, not entirely, because the materials are similar, also.

Q. The materials between Dwayne Arnold and Allens Creek are similar?

A. Uh-huh.

Q. What is the basis for that statement?

A. Because the materials have to be -- have to do the same job that there is an effort made to put the least susceptible to crack materials to work in the nuclear power plants.

Q. What was the material used at Dwayne Arnold?

A. Specifically, I don't know.

Q. What will be the material used at Allens Creek?

A. Specifically as I said previously, I don't know.

Q. Then how can you make any statement as to their similarities?

A. Because of the reasons I gave you earlier.

Q. You really believe that?

A. Yes.

MR. NEWMAN: Is there a relationship between the rate of flow and intergranular stress corrosion, cracking?

A. I'm not certain there is.

MR. NEWMAN: Are you asserting that the intergranular stress corrosion cracking at Dwayne Arnold could occur at the Allens Creek plant?

A. It could, yes.

MR. NEWMAN: That's the basis of this contention?

A. Well, cracking is all I think the contention says. Let me see. It it just says large deep cracks.

MR. NEWMAN: What do you mean by that? Your example refers to the intergranular stress corrosion cracking.

A. Well, the example was an example not meant to include all possibilities.

MR. NEWMAN: What, if any other types of cracking do you postulate?

A. None other at this time.

MR. NEWMAN: Okay.

Q. (BY MR. BIDDLE): Have you consulted

with any experts on the subject matter of this contention?

A. No, sir.

Q. Do you hold yourself out as an expert on intergranular stress corrosion cracking or the phenomena of water hammer?

A. Not at this time.

MR. NEWMAN: Can you identify any instance in which there has been a coincidence of intergranular stress corrosion cracking and water hammer, the result of which has been the cracking, breaking of the pipe.

A. Not at this time, no.

MR. NEWMAN: Again, that's something you will inform us of as soon as you're able to?

A. Yes, I will.

MR. NEWMAN: If there were none such, what would the basis of your contention be?

A. The ACRS concern.

MR. NEWMAN: It would not be based on any imperical data?

A. That's right.

Q. Would you turn to contention 30? Let's take about a five minute break first.