UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	
CAROLINA POWER & LIGHT COMPANY (Shearon Harris Nuclear Power Plant)	Docket No. 50-400-LA ASLBP No. 99-762-02-LA

DEPOSITION OF
GORDON THOMPSON, PH.D.

COPY

At Raleigh, North Carolina
October 21, 1999
9:40 AM to 4:14 PM
Reported by: Melody L. Rife, RPR

Thereupon, the following proceedings were had:

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(Thereupon, a discussion was held off the record)

DR. HOLLAWAY: I also ask that you transcribe everything during the deposition, except during breaks and when we go off the record, when nothing should be transcribed. And please interrupt, if it's necessary, to clear up any doubt about a question or answer.

THE COURT REPORTER: Thank you.

DR. HOLLAWAY: I'd like you to mark exhibits prior to commencing examination, so we have that clear.

(Thereupon, a discussion was held off the record)

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Thereupon,

GORDON THOMPSON, PH.D.

having first been duly sworn, was examined and testified as follows:

A. Right.
Q. Do you agree with the findings of this book?
A. I find it a generally useful book that I found to contain generally accurate information. I would not necessarily support all of the findings and recommendations.
Q. Any findings or recommendations that you know of that you don't agree with in Mr. Lochbaum's book?
A. I don't recall any at present.

DR. HOLLAWAY: I'll ask the court reporter to mark as Exhibit 2 the curriculum vitae of Gordon R. Thompson dated July 1999.

(Thereupon, Thompson Exhibit No. 2 was marked for identification)

Q. Dr. Thompson, have you seen this document before?
A. I wrote it.
Q. So you authored this.
A. Yes.

Q. Are the statements in here truthful?
A. Yes.
Q. This states that you have a Ph.D. in applied mathematics?
A. Correct.
Q. What does that relate to?
A. The work was in the -- the theory of high-temperature plasmas. So it could be considered theoretical physics, but it happened to be done through the math faculty.
Q. Can you tell me what courses you have taken in fission reactor engineer?
A. None.
Q. Can you tell me what courses you've taken in fission reactor criticality control?
A. None.
Q. Okay. What training have you had in fission reactor criticality analysis?
A. None.
Q. Are you an expert in fission reactor criticality analysis?
A. For the purpose of this proceeding, yes.

Q. On what basis do you state that?
A. My contribution to the -- to this proceeding relies on my basic expertise in scientific principles and analytic principles and my general experience with engineering in general and nuclear plant engineering in specifics.
Q. So when you assert that you're an expert in fission reactor criticality analysis, that would be in the general scientific principles attendant to criticality?
A. The brief that -- to which I will -- that -- my contribution to Orange County's brief will rely upon expertise that I possess.
Q. Could you answer my question?
THE WITNESS: Could you read it back?
(Thereupon, the question beginning on page 21, line 10, was read by the court reporter)
A. Yes, and on the application of those principles to the contention.
Q. Okay.

Tell me what criticality analysis codes you have run yourself.

A. I have not run any, as such.

Q. Okay. Can you tell me what training you've had in running criticality analysis codes?

A. None.

Q. Okay. What codes are used to perform fission reactor criticality analysis?

A. Codes that are identified in the CP&L application and in the subsequent correspondence, response for the request for additional information.

I don't remember the names of those codes. And I should say as a point of clarification that I don't expect to run or seek to have run any of those codes in connection with this proceeding.

Q. Okay, so you have not run any criticality analyses yourself for this proceeding?

A. Correct, and do not anticipate doing so or having this done.

Q. Okay. Are you competent to evaluate the

results of a criticality analysis?

A. Yes.

Q. If you've never been trained in running the codes, have not run the codes yourself, how can you evaluate whether the analysis itself is correct?

A. In evaluating an analysis, there are two primary aspects to the evaluation. One is to -- given the assumptions on the line analysis, to assess the analysis that was performed pursuant to those assumptions. The other aspect is to examine the assumptions and assess whether those assumptions are sufficient to address the issues that might be of concern in connection with criticality.

I -- in the course of this proceeding, I will expect to confine my assessment primarily and perhaps totally to the assessment of assumptions and their adequacy.

Q. So you've identified two aspects here. The first one is sufficiency of the

assumptions --

A. Right.

Q. -- second is given those assumptions, the analysis itself.

A. Correct.

Q. You believe that you're competent to address the sufficiency of the assumptions; is that correct?

A. Yes.

Q. Do you have the expertise to address the second part, whether -- given those assumptions are valid, that the analysis done after it is in fact correct and valid?

A. Not without doing a lot of studying. As of this moment, no, I am not competent to do that.

Q. Okay. Do you anticipate doing that?

A. Not over the time frame of this proceeding.

Q. Okay.

Dr. Thompson, are you licensed as a nuclear power plant operator?

A. No.
Q. Have you ever been licensed as a nuclear power plant operator?
A. No.
Q. Have you been trained to operate a nuclear power plant?
A. No.
Q. Have you been an engineer at a nuclear power plant?
A. No.
Q. Have you ever implemented procedures at a nuclear power plant?
A. No.
Q. Have you ever written procedures for a nuclear power plant?
A. No.
Q. Have you ever worked at a nuclear power plant?
A. No.
Q. Are you an expert in nuclear power plant operations?
A. No.
Let me -- let me correct that frame.

I have performed studies and presented testimony relating to the safety of nuclear facilities, including nuclear power plants; and in the course of those studies and preparing those testimonies, I have become expert in operational matters pertinent to the analyses and testimony. So in that limited sense, I am an expert in operations. It's a very circumscribed sense.

Q. Okay. Could you define what those areas are that you got the limited expertise in?

A. Let's take the present proceeding and Contention 2. I'm now familiar in a general sense with the configuration of the Harris Fuel Building and its equipment, and in a general sense, with the procedures used to manage fuel. I may acquire additional knowledge on these matters prior to the filing.

Q. You say you're familiar in a general sense.

MS. CURRAN: Excuse me. Before we go

on with the next question, I'd like to take a short break.

DR. HOLLAWAY: I'd like to finish the next couple questions that go directly to the question that he just responded to and I'd be happy to take a break, if that's okay.

MS. CURRAN: Okay.

Q. You said you're familiar in a general sense with the equipment at the Harris plant. What is that familiarity based on?

A. Based on -- I think I said the fuel handling building.

Q. Fuel handling building.

A. To date, that's based on review of the FSAR and other documents provided by CP&L and deciphers of yesterday.

Q. Okay. When you state --

A. -- and --

Q. Oh.

A. Correction -- and with some additional information obtained from the deposition yesterday of Mr. Devoe.

Q. Okay.

You state you're familiar in a general sense with the procedures for the fuel handling building. What's that based on?

A. Again, the same data source that I just described.

Q. Okay.

A. Data set.

Q. Your familiarity is just in a general sense, it is not from actual application?

A. That's correct. Nor would I claim to be familiar with all of the procedures used in fuel management at Harris.

Q. Okay. And even the ones that you've read or heard about, you have not actually applied yourself.

A. Correct, correct.

Q. Have you seen them applied?

A. No.

Q. Okay.

DR. HOLLAWAY: Diane, if you'd like to take a break, it will be fine.

MS. CURRAN: Okay.

DR. HOLLAWAY: How long do you want?

MS. CURRAN: Five minutes.

(Thereupon, a break was taken at 10:05 AM, with proceedings recommencing at 10:12 AM)

THE WITNESS: I'd like to clarify one of my previous statements. Is that okay?

DR. HOLLAWAY: Yes; go ahead.

THE WITNESS: You asked about my expertise in nuclear plant operations.

DR. HOLLAWAY: Yes.

THE WITNESS: And I stated that I have performed many studies and presented numerous pieces of testimony pertaining to the safety of nuclear facilities. This goes back into the 1970's. So I've become familiar with details of numerous facilities, nuclear power plants and other nuclear facilities, in several countries. And I have always taken pains to acquire the necessary familiarity with the details of the design and operation of each

facility in order to support whatever claim I made in my study or testimony.

DR. HOLLAWAY: Okay.

THE WITNESS: And that's typically not the same as the -- as the level of operational familiarity that one would require as an operator or manager of such a facility. It's a sufficiency of knowledge and expertise to support whatever claim about safety is made in the study or testimony.

And in this proceeding, I will expect to meet the same standard, that any claim that I make will be supported by sufficient expertise and familiarity with the design and procedures and operational characteristics of the Harris plant.

DR. HOLLAWAY: Okay.

Q. Your ability to speak on these issues I gather would depend on what the specific issue was?

A. I -- yes, with the clarification that I have on various occasions become --

acquired knowledge and expertise that I didn't -- did not possess up to that point --

Q. Okay.

A. -- in the realm of nuclear safety.

Q. Your familiarity with design and operations of a facility, outside of your description of time in the fuel handling building, would be based on reports you've read, documents you've read; is that correct?

A. And on applications of general physical principles.

Q. Okay. When you say "application of general physical principles," you're talking about theoretical application, not physically doing things, is that correct, yourself physically doing things?

A. I -- yes.

Q. Okay. And you say your expertise would not be the same as an operator or manager of a nuclear power plant. I presume that would include workers, technicians,

et cetera that are actually working at the facility.

A. Yes.

Each -- each such person has a particular realm of expertise, and there's only so much you can do in one life.

But I emphasize that I'm always very careful to support my claims and findings with knowledge about the underlying -- about relevant matters underlying those findings.

Q. That's certainly laudable.

How much time did you spend in the Harris Fuel Handling Building?

A. The site visit lasted about two hours, I recall; so maybe an hour in the building.

Q. Okay. Does that hour in the building make you an expert on the fuel handling building?

A. It mostly confirmed the general understanding I obtained from the FSAR.

Q. Okay; layout of where things were, et cetera.

A. Right.
Q. Okay. Have you been in other fuel handling buildings at other facilities?
A. Darlington; Main Yankee; Dukovany; and TMI, Unit 2.
Q. Where is the Darlington plant located?
A. Canada, in the province of Ontario.
Q. Okay. Is that a pressurized water reactor like Harris?
A. No.
Q. TMI, Unit 2; when were you there?
A. In the '79-80 period. I don't recall exactly. 1- -- 1980.
Q. It was after 1979.
A. Yeah.
Q. What type of reactor is Main Yankee?
A. PW- -- it -- I don't recall the vendor.
Q. And what were you doing in the fuel handling building there and for how long?
A. It was a site visit in connection with an intervention by the State of Maine.
Q. What year was that?
A. I think 1981.

Q. How long were you in that fuel handling building?
A. Maybe an hour.
Q. Dukovany; what type of reactor is that?
A. Czech Republic, for PWR units, Russian design.
Q. Russian design?
A. Soviet design.
Q. Okay. Is there an acronym that that goes by?
A. The -- the Russian for PWR is VVR.
Q. VVR?
A. Any pressurized water reactor.
Q. Okay.

What were you doing in the fuel handling building there?

A. I was representing the investor, Vienna, which in turn represented the Chancellor's Office of Austria, which was concerned about safety of fuel management at Dukovany, which is a neighboring country.
Q. What year were you there?
A. 1992.

Q. How long were you in the fuel handling building?

A. In about an hour.

Q. Okay.

You mention that part of your expertise is based on sitting in on Mr. Devoe's deposition yesterday; is that correct?

A. That's a contribution to it, yes.

Q. Okay.

A. The contribution to my knowledge, rather than expertise.

Q. Very good. How long were you in that deposition?

A. I'd guess about two hours.

Q. And did what you learned in Mr. Devoe's deposition substantially increase your knowledge on these issues?

A. No; it was a comparatively minor increase in knowledge. There were lots of loose ends left unresolved.

Q. Can you approximate, I guess percentage-wise? Is it, like, a fifty

percent increase in knowledge?

A. Oh, no; much less.

Q. One percent?

A. Less.

Q. Less than one percent?

A. Hard -- hard to say, but small. I --

Q. Okay. I mean --

A. It's not a matter that's susceptible to numerical estimate.

Q. But it's less than fifty percent?

A. Yes.

Q. Okay; less than twenty-five percent?

A. Probably, but I wouldn't give a number on that.

Q. Okay.

You have stated that you will address and do understand assumptions that go into criticality analysis.

A. Correct.

Q. Okay. Even if you don't actually do the criticality analysis yourself --

A. Correct.

Q. -- the assumptions you can address.

A. Correct.

Q. Okay.

Referring to your curriculum vitae, which is a lot of pages, on page 1 it addresses sponsors and tasks.

A. Correct.

Q. Aside from the Orange County, North Carolina, which I understand to be the present proceeding, which of these dealt with your evaluation of assumptions used in criticality analysis?

A. None of these so far.

Q. Okay.

On page 4 your CV lists publications. Aside from the first one, which is this proceeding, which of these publications address assumptions used in criticality analysis?

A. None so far.

Q. On page 8 there are expert presentations and testimony?

A. Correct.

Q. Which of these address assumptions used in