RAS 2804

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

G. Paul Bollwerk, III, Chairman
Dr. Peter S. Lam
Thomas D. Murphy

In the Matter of	Docket No. 50-400-LA
CAROLINA POWER & LIGHT COMPANY	ASLBP No. 99-762-02-LA
(Shearon Harris Nuclear Power Plant)	March 1, 2001

MEMORANDUM AND ORDER
(Record Material)

Attached to this issuance are two items that are being incorporated into the record of this proceeding. Attachment A consists of reproductions of five poster-size visuals that were used by counsel for applicant Carolina Power & Light Company (CP&L) during the December 7, 2000, 10 C.F.R. § 1113(a) oral argument. These visuals, which were used by counsel to illustrate various argument points, were not admitted as exhibits in the proceeding, but were to be bound into the transcript. Because of delays in providing reduced versions of these items and a change in the agency's court reporting company, these visuals were not incorporated into the argument transcript. With this memorandum and order, the Board provides copies of these visuals to the parties and directs that they be included in the agency docket for this proceeding for use with the transcript.

Attachment B is a document, labeled BCOC Summary Exhibit 3, that counsel for intervenor Board of Commissioners of Orange County, North Carolina (BCOC), attempted to have admitted into evidence during the oral argument. The document was ordered identified as an exhibit and the Board ruled, in accordance with 10 C.F.R. § 2.1113(d), that the document

would not be admitted as evidence in the proceeding. See Tr. at 518, 528. Again, because of a change in the agency's court reporting company, up to this point the document has not been incorporated into the agency record for this proceeding. With this memorandum and order, the Board provides the parties with copies of this document, which has been marked as an exhibit, and directs that it included in the agency docket for this proceeding.

It is so ORDERED.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD

G. Paul Bollwerk, III
ADMINISTRATIVE JUDGE

Rockville, Maryland

March 1, 2001

* Copies of this memorandum and order, without the accompanying attachments, were sent this date by Internet e-mail transmission to counsel for (1) applicant CP&L; (2) intervenor BCOC; and (3) the NRC staff.

ATTACHMENT A

TABLE OF CP&L EXHIBITS

1.	Exhibit #1	Dr. Thompson's "Requirements For A Comprehensive Analysis"
2.	Exhibit #2	Table 5 - 1
3.	Exhibit #3	Table 5
4.	Exhibit #4	Harris Fuel Handling Building
5.	Exhibit #5	Site Schematic

Dr. Thompson's "Requirements For A Comprehensive Analysis"

	CP&L	NRC Staff	BCOC
Expert Team	✔	✔	
Degraded Core Accident at Harris (Level 1 PRA)			
• Consider internal and external initiating events	✔	✔	✔
• State-of-the-art analysis	✔	Δ	
Containment Failure or Bypass			
• Build upon the Level 1 PRA	✔	✔	
• Represents state-of-the-art for Level 2 PRAs	✔	Δ	
• Significant pathways for radioactive material release identified	✔	✔	
• Transport and distribution of radioactive material modeled	✔	✔	
Loss of Spent Fuel Pool Cooling and Makeup			
• Extend Level 1 PRA to address interruption of spent fuel pool cooling and makeup	✔	Δ	
• Extend Level 2 PRA to address onsite distribution of radioactive material impact on spent fuel pool cooling and makeup	✔	Δ	
Onsite Radiation Exposure			
• Characterize radiation environment at critical locations	✔	✔	
• Characterize other factors that could affect human performance	✔	✔	
• Primarily deterministic analysis	✔	✔	
Effect of Onsite Radiation Exposure On Plant Operation			
• Actions by personnel and equipment precluded by radiation or other factors	✔	✔	✔
• Scenarios whereby pool cooling and makeup may be restored identified	✔	✔	
• Radiation exposure precluding human action identified	✔	✔	✔
• Characterize required human actions, infrastructure, and preparations	✔	✔	✔
• Assess probability that scenarios could be implemented	✔	✔	
Loss of Pool Water by Evaporation			
• Deterministic calculation examining a range of assumed heat loads and gate positions	✔	✔	✔
Initiation of Exothermic Oxidation Reactions			
• Assess the potential for self-sustaining exothermic reaction	✔(1.0)	✔(1.0)	✔(1.0)
Uncertainty			
• Sensitivity Evaluation	✔		
• Conservative Upper Bound		✔	✔*
Peer Review			
• PRA	✔	✔	
• Spent Fuel Heatup Analysis	✔	✔	

Source: ERIN Engineering Report

Table 5-1

SHNPP SFPAET RESULTS BASE CASE
ACCIDENT SEQUENCE FREQUENCIES (CASE A)

Event	Description of Events that Involve Initiators, Core Damage, and Containment Failure or Bypass	Input from Level 1 & 2 Quantification[1]	Output from SFPAET[2]
Internal Events			
ISLOCA	INTERFACING SYSTEMS LOCA	9.97E-9	7.44E-10
LG-SGTR	LARGE STEAM GENERATOR TUBE RUPTURE	1.57E-06	3.44E-09
SM-SGTR	SMALL STEAM GENERATOR TUBE RUPTURE	1.51E-06	3.31E-09
LG-ISOL	LARGE ISOLATION FAILURE	7.59E-08	9.77E-10
SM-ISOL	SMALL ISOLATION FAILURE	1.88E-07	2.59E-09
EARLY	EARLY CONTAINMENT FAILURE	3.14E-08	1.15E-09
LATE	LATE CONTAINMENT FAILURE	4.28E-06	1.43E-08
Total Internal Events Contribution		7.67E-06	2.65E-08
Fire Induced Events			
EARLY	EARLY CONTAINMENT FAILURE	2.95E-09	7.98E-11
LATE	LATE CONTAINMENT FAILURE	9.77E-07	2.86E-09
Total Fire Events Contribution		9.80E-07	2.94E-09
Total Seismic Contribution		-	8.65E-08
Shutdown Events			
SHDN	SHUTDOWN WITH CONTAINMENT BYPASS	7.2E-07	1.45E-08

[1] CDF with containment failure, bypass, or containment isolation failure (per year).

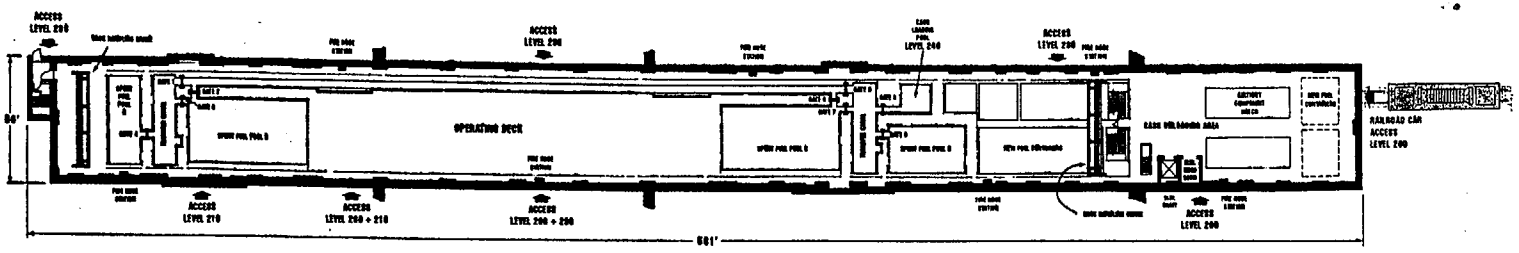
[2] Frequency of the loss of effective water cooling to the spent fuel (per year).

Source: Gordon Thompson Report

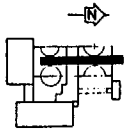
TABLE 5

ELEMENTS OF A MINIMUM VALUE FOR THE BEST ESTIMATE OF THE OVERALL PROBABILITY OF THE SEVEN-PART EVENT SEQUENCE IDENTIFIED BY THE ASLB

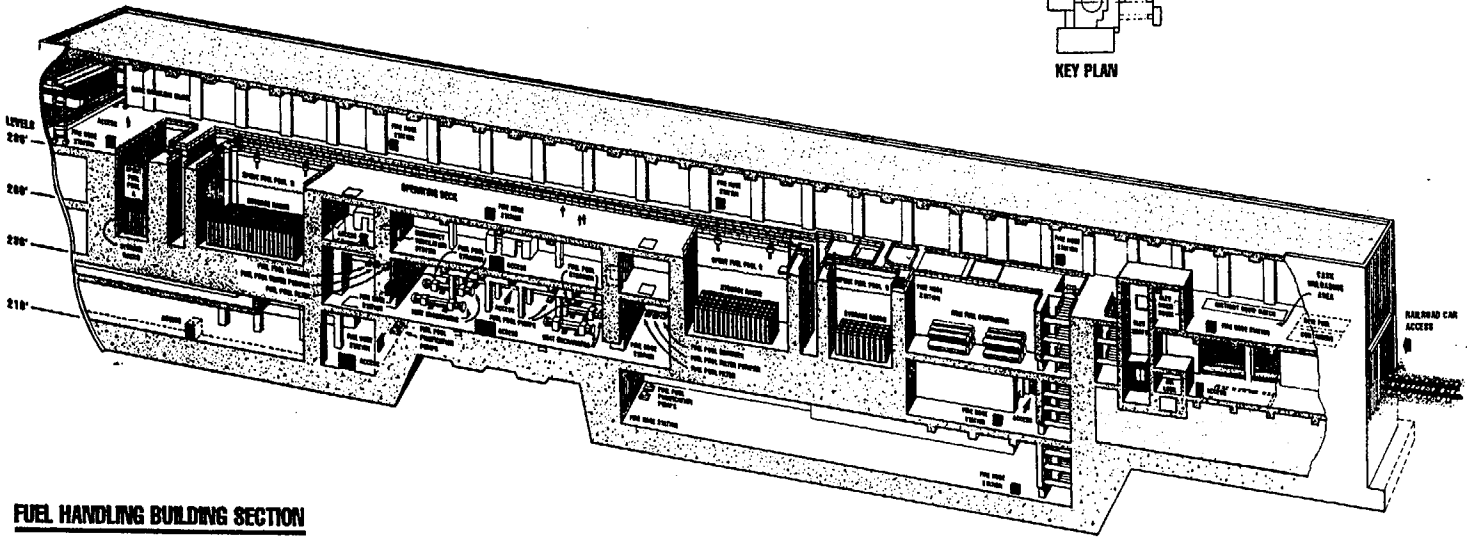
Stage of Sequence	Probability
(1) Degraded-core accident (Occurrence of selected sequences)	Point Est. Prob. = 3.1×10^{-5} per yr Range = 0.4×10^{-5} to 2.4×10^{-4} per yr
(2) Containment failure or bypass (For selected degraded-core sequences)	Conditional Prob. = 0.5
(3) Loss of spent fuel cooling and makeup (For selected degraded-core sequences)	Conditional Prob. = 1.0
(4) Extreme radiation environment onsite (Assuming containment bypass)	Conditional Prob. = 1.0
(5) Restart of pool cooling or makeup (Assuming extreme radiation env.)	Conditional Prob. = zero
(6) Loss of pool water by evaporation (Assuming no restart of cooling or makeup)	Conditional Prob. = 1.0
(7) Initiation of exothermic oxidation reaction in pools C and D (Assuming loss of water)	Conditional Prob. = 1.0
BEST ESTIMATE OF OVERALL PROB. OF INITIATION OF EXO. OXIDATION REACTION IN POOLS C & D (For selected degraded-core sequences)	Point Est. Prob. = 1.6×10^{-5} per yr Range = 0.2×10^{-5} to 1.2×10^{-4} per yr



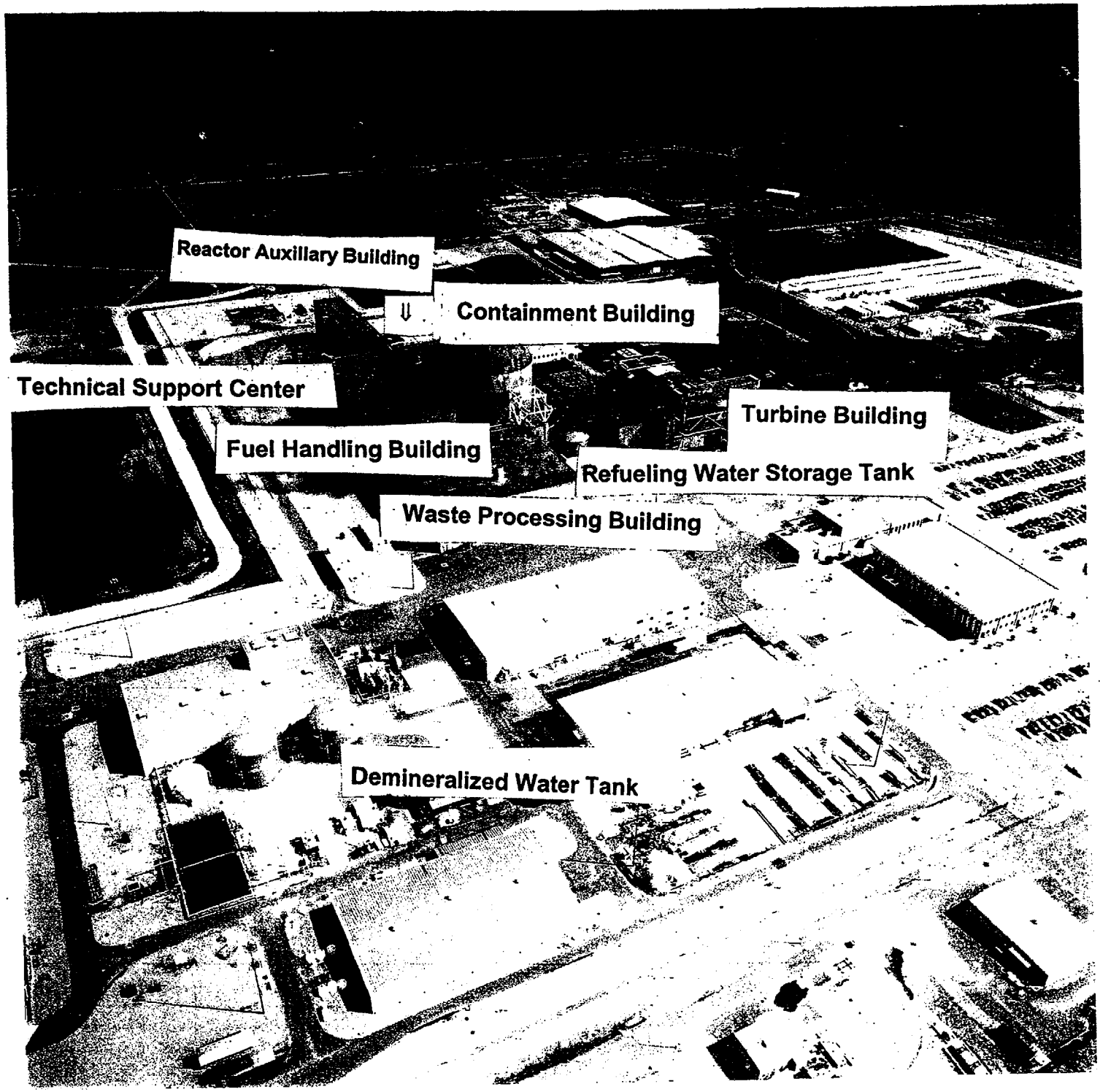
OPERATIONS DECK PLAN
LEVEL 286'



KEY PLAN



FUEL HANDLING BUILDING SECTION


Reactor Auxillary Building
Containment Building
Technical Support Center
Turbine Building
Fuel Handling Building
Refueling Water Storage Tank
Waste Processing Building
Demineralized Water Tank

ATTACHMENT B

BCOC Summary Exh. 3

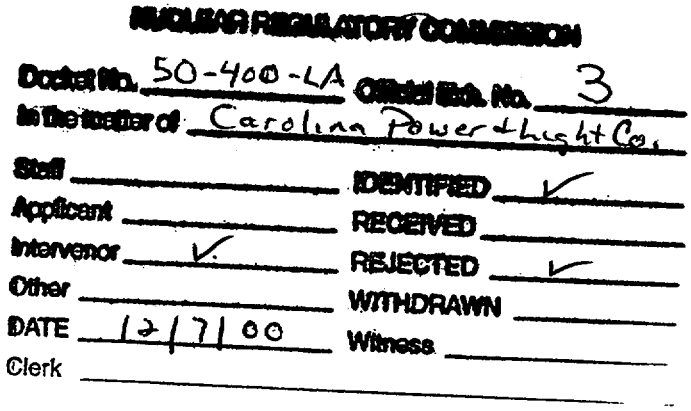
UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

Deposition of EDWARD T. BURNS, Ph.D., held at Harmon Curran Spielberg & Eisenberg, LLP, 1726 M Street, N.W., Third Floor, Washington, D.C., 20036, commencing at 9:40 a.m., October 20, 2000, before DEBORAH K. WILKINS, RPR and Notary Public.



ORIGINAL

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

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A P P E A R A N C E S O F C O U N S E L:

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Also Present: Gordon Thompson, Ph.D.
Gareth W. Parry, Ph.D.
Edward L. Wills, Jr.
John R. Caves
Stephen LaVie

involved in the analysis of nuclear power plants from an overall risk perspective.

Q. You consider yourself an expert in probabilistic risk assessment?

A. I have extensive experience in probabilistic risk assessment, I believe, that would qualify as an expert in this case, yes.

Q. Do you believe it is necessary to have designed a nuclear plant in order to be an expert in probabilistic risk assessment?

A. No, ma'am.

Q. Do you believe it's necessary to have operated a nuclear plant in order to be an expert in probabilistic risk assessment?

A. No.

Q. Okay.

Looking back at your resume' again, I would like to talk about the bullet here you have which says manager and lead technical analyst of the Duane Arnold Level 1 and 2 technical support for response to the Severe Accident Policy Statement, 1991 to 1995. Could you describe what

relative to that submittal.

Q. How many people worked on that PRA?

A. Would you like to know the number of people who contributed or the number of man-years that were involved?

Q. Well, why don't you give me both.

A. I would say that there were six consultant contributors.

Q. When you say six consultant contributors, you mean six individuals?

A. Six individuals.

Q. Okay.

A. And there were four individuals at Duane Arnold who were primarily part of the team.

Q. So this was a team of people from the consultant and Duane Arnold?

A. Yes, ma'am. Usually probabilistic risk analysis would require a team of people drawing from all disciplines to complete the effort.

Q. Why is that? Why do you have to draw from so many disciplines?

A. Since the analysis involves an

integrated look at the plant, it uses information associated with the engineering of the plant, the testing of the plant, the operator interaction with various pieces of the plant and its control with the analysts who have done thermal hydraulic calculations around the plant, so nearly all of the disciplines that are associated with the design and operation of the plant are called into play as part of that analysis.

Q. You were going to tell me how many man-hours. Is it all men?

A. The number of engineering person-hours associated with the Duane Arnold work from the consultant side was approximately five person-years.

Q. How about from the utility side?

A. I wouldn't know the answer to that.

Q. And no way of making a reasonable estimate?

A. No, I wouldn't be able to tell.

Q. Did the utility members of the team make a substantial contribution to the effort?

A. Six consultants.

Q. Six consultants.

Did they represent different disciplines? Can you tell me what they were?

A. Disciplines were the people who set up the framework for the analysis to identify the accident scenarios, to identify what the containment failure probability would be for different accident conditions, personnel to identify the human reliability analysis portion of that, of the Level 2, and then personnel to perform the thermal hydraulic calculations to support the radionuclide release calculations, the thermal hydraulic conditions inside the containment, the conditions inside the reactor building if a containment failure occurred, and then the radionuclide releases for each of the pathways that could be identified through the containment and through the reactor building.

Q. So were there four different disciplines represented on this team, would you say?

A. I don't want to mislead you. The

probabilistic risk analysis includes a whole spectrum of types of analysis that needs to be performed in order to support any one of these things. To say there are four disciplines is probably an oversimplification --

Q. Okay.

A. -- because we draw on so many different inputs. In some cases we rely heavily on the people who are giving us the inputs. In other cases we require the expertise to be part of the team.

Q. So it might be more fair to say that there are many disciplines represented in a team like this?

A. Yes.

Q. Okay.

And how many people from the utility were represented on the team?

A. Two.

Q. Two?

On the consultant's part, how many person-hours did the effort take? I see it was --

it looks like a two-year project?

A. It was two years, two units. So in this particular case the utility took on a substantial fraction of the analysis, so the consultant time was approximately six person-months per unit.

Q. So that was one person-year for both units?

A. Approximately. Consultant time.

Q. You had said that the Limerick Level 2 PRA took your firm about one person-year of time. Is the difference -- that was for one unit, the Limerick?

A. Limerick is a two-unit site.

Q. So you looked at two units for Limerick?

A. We performed a calculation for one unit.

Q. I see. Okay.

It seems like from a total perspective that Nine Mile Point, if you include the compensatory time spent by the utility work that you all weren't doing, took maybe twice as long. Is that simply because there were twice as many units being analyzed there or is that fair to say?

A. It would be a comparable amount of time.

Q. Were those amounts of time in addition to the amount of time that you described for me in relation to the bullets above for the Peach Bottom and Limerick studies?

A. Yes.

Q. But they are related in the sense that that is input into the same study, right?

A. Yes.

Q. The first bullet on your resume' under work experience says: Led or participated in 11 BWR PSA peer review certifications in '96 to '97. Could you describe what was involved there?

A. The industry recognized as part of risk-informing regulation that the ability to assure the public and the NRC that probabilistic risk assessments were valid tools to be used in risk-informing regulation applications that there needed to be a method, an accepted method by the NRC, by the industry and by the public that the probabilistic risk assessments were performed in a manner that could be considered high quality and

be reproducible, and so as a farther part of that industry effort one of the first steps that was done was for a peer review process to be developed.

So a peer review process was developed, and myself and Karl Fleming and Doug True participated in the development of a peer review process that could be used in evaluating a PRA to see whether the principal elements were properly incorporated, whether the methods used were of high quality, and whether those methods had been implemented in a way that produced a risk profile that was realistic given the plant configuration and the specific plant features that existed at the plant.

As part of that process, we pilot tested that at three plants in 1996, we fed back the results of that pilot test into the guideline development and then issued the guidelines in 1997, and then at that point we started implementing the guidelines on the review of PRAs to ensure that they had an adequate, I will say,

quality for use in risk-informing regulation.

Q. You mentioned PRA for risk-informed regulation which is a term of art for an approach to safety regulation that's going on within the NRC right now; is that correct?

A. I am not sure what term of art means.

Q. Well, when you say risk-informed regulation, I can almost put capital letters on that because it's an approach that the NRC is taking to safety regulation, and my ultimate question is: Do you have a different standard for PRAs depending on what their purpose is?

A. Are you asking my personal --

Q. Yes, your professional opinion.

A. My professional opinion is that probabilistic risk assessments can be performed for a number of different reasons. The probabilistic risk assessments that were performed as part of the original individual plant examination evaluations for response to generic letter 88-20 were those that were used to identify whether vulnerabilities existed at the plant that

would characterize those uncertainties that most influence the PRA relative to that specific application. So there are compensatory measures that could be taken for using the PRA under certain circumstances.

Q. Do you consider that the provision for peer review of a PRA is an important element for assuring the quality of the PRA?

A. Yes.

Q. And why is that?

A. Because the number of analyses and inputs that need to be treated and the number of decisions that need to be made as part of a PRA can be quite numerous. There is a possibility that the PRA team themselves do make decisions that are different than what the core methodologies might dictate are appropriate, so it is useful to have a group of experts come in to examine the methods that have been used and how they are implemented and to check the reasonableness of the results to determine whether the PRA makes good technical sense and is

supportable and that the results are traceable to the inputs that are used as part of the PRA.

Q. And does peer review generally require a team effort similar to or analogous to the team effort that is required for a PRA in the sense that no single discipline is adequate to evaluate the PRA?

A. I believe that is a fair statement, yes.

MS. CURRAN: This would be a good time for me to break for lunch unless you would like to sit here and skip lunch.

MR. O'NEILL: Probably not.

(Luncheon recess -- 12:20 p.m.)

Afternoon Session (1:35 p.m.)

BY MS. CURRAN:

Q. Dr. Burns, I would like to ask you about the work that you are doing on the Harris license amendment case. I understand that you are preparing an affidavit or evidentiary presentation with a Subpart K proceeding for the applicant's response to contention EC-6; is that correct?

A. I am not familiar with the --

A. Yes.

Q. Do you plan to have the study peer reviewed?

A. Yes.

Q. By whom will it be peer reviewed?

A. Karl Fleming and Doug True.

Q. Are they employees of the same company where you work?

A. Yes.

Q. Is it consistent with the peer review guidance that's referenced in your resume' to have a peer review done by the same company that performed the study?

A. I believe I wasn't precise enough in my terminology when I responded to your question. First, to answer your second question, is: It would be inconsistent with peer review methodology that we developed to have the person who performed an analysis peer review it. It would not be inconsistent or it would be consistent to have a peer review even if it was a member of the same company. That would be allowed under the peer

review process that's being developed by the industry.

The previous question that you had asked me about peer review, I should say we are anticipating having an independent review done by Karl Fleming and Doug True, and that would be our submittal to the customer, in this case counsel, and it would be up to the counsel or CP&L to decide whether a peer review process would be required, so I'm sorry I wasn't accurate when I responded to you before.

Q. Okay.

And a review done by -- let me scratch that.

Mr. Fleming and Mr. True, will they participate in any way in the preparation of this study?

A. They have given me some guidance, and they have done some preliminary reviews of the methods that we are going to use to make sure that we are doing it in a manner consistent with their technical expertise.

Q. Do you expect to be getting other input or advice from them as you go along in the study?

A. One specific task has been identified as part of their review thus far, and that is, that the interfacing system LOCA frequency that had been calculated previously as part of the PRA appeared to be extremely high compared with sister plants, and so they have identified that as an analysis that may need to be updated as part of this effort to make sure that it accurately and realistically characterizes the plant.

Q. What are Mr. Fleming's and Mr. True's positions in the company?

A. Mr. True is a senior vice-president and Mr. Fleming is a vice-president in charge of PWR, PRA risk -- probabilistic risk assessments.

Q. How much time have you budgeted for them to do their review?

A. I am not the contractual project manager, so I am not sure.

Q. So you don't know how much time has been budgeted for their review?

A. No.

Q. The figure that you gave me of one person-year for the effort, does that include their review?

A. Yes.

Q. I believe you indicated to me before that peer review certification guidelines that you have participated in developing have a spectrum of standards or criteria in terms of their rigor, that there's a variation depending on the purpose; is that correct?

A. They allow the peer review team the flexibility to describe the PRA over a spectrum of level of detail, scope and quality, yes.

Q. So depending on the purpose, the guidelines might have a choice of what quality standard would apply?

A. I'm sorry. Could you repeat that or read it back?

Q. If you don't understand it, let me try to rephrase it.

There isn't a single standard in the

peer review guidelines that you described to me, right?

A. Peer review guidelines are not a standard.

Q. But they express certain criteria or goals, do they?

A. They express criteria upon which the peer review team would make judgments relative to the quality of the PRA.

Q. Okay.

Under these guidelines, will this PRA be of the highest quality possible?

A. This PRA, meaning?

Q. The one that you are working on for CP&L.

A. I would like to be a little careful here.

We are doing a probabilistic risk assessment of the analysis that was requested by the ASLB in their order, so we are doing an analysis, but it uses as input the probabilistic risk assessment of the Shearson Harris plant that

the probability of each of these events in the chain of events?

A. No.

Q. What have you been asked to do with respect to this list?

A. We have been asked to answer question number 1 relative to that list.

Q. Okay. So what will you be doing in order to answer question 1 with respect to that list?

MR. O'NEILL: You might want to make that more specific because he can probably answer the question for the next three hours. You need to ask a question he can answer.

BY MS. CURRAN:

Q. Are you giving a best estimate for the probability for each of the events listed on page 13?

A. We are using the best technical information that we have available to us and can develop within the time frame available to answer the question posed by the Board, that as engineers

will do and we will be forced most likely to do in this case is that some estimates may be conservative, although we will try to characterize that level of conservatism in the response so as not to mislead the Board.

Q. So I am trying to -- let me just articulate what I hear you implying to me, is that at least for some of these scenarios you don't feel that there's enough time to prepare a realistic probability estimate, so that you are going to give a conservative estimate to somehow compensate for that? Do I understand that correctly?

A. I can't agree with the premise that you are giving me. We will give a -- as the question asks, a best estimate overall probability of the sequence, that's what we will provide to the Board, provide to counsel anyway, and that best estimate will have information in it that is of course limited by our current state of knowledge.

I think the principal example of that is in step number 7, the initiation of an exothermic

oxidation reaction in pool C and D. I currently don't have all of the technical facts as of this time, so at this point in time I can't make the statement that we will be able to provide the best estimate evaluation of that, and we may have to provide a sensitivity evaluation along with characterizing the uncertainties in that so that those decisionmakers who need to know what effect that has on the overall sequence evaluation will be able to understand what we have done, but we will in fact have a best estimate evaluation characterized by those uncertainties.

Q. Will your work involve looking at each of these seven scenarios and making a best estimate of conditional probability for each one of them?

A. I don't believe these are seven scenarios.

Q. Or seven accident steps. Would that be a better way to describe it?

A. We will look at each of the contributors to the overall scenario because one of the

because I don't believe that there have been extensive differences associated with the difference between 1995 and 2000.

MS. CURRAN: I would like to ask counsel if these calculations have been produced to us.

MR. O'NEILL: I can tell you that the PSA folks, PRA folks at CP&L put every shred of paper that they could find that supported the PSA, and that was their instructions, and they have gone back to check it and they have gone back again to get all of the peer reviews of even the early, now outdated, IPE and even a precursor to it which was presented in the stack that you got today, so at least the instructions, and I believe since they are very thorough, careful, precise engineers, that you have everything that they could identify, either you have it or you had an opportunity to elect to have copies made of it.

BY MS. CURRAN:

Q. You had said that you intend to have an independent peer review performed; is that correct?

A. Of?

Q. Of the PSA? Is that what you said? Of the latest PRA for the Harris plant?

A. That looks at step number 1 of degraded core accident? The PSA from 1995 updated by the calculation?

Q. Is that what you are referring to that is going to be peer reviewed?

A. Yes.

Q. Okay.

And how, when and by whom is that going to take place?

A. It's going to be done by a team of PWR experts as part of this process -- of the process that we are going through to produce the overall probability of these seven steps.

Q. Is this the same team of experts that you referred to me before, Mr. Fleming and Mr. True?

A. Mr. Fleming is the head of the peer review process, and he has a team that's working for him separately.

Q. And this team is in-house, within your company?

A. Yes, ma'am.

Q. Do you plan to look at any other source besides the PSA for Harris for the first contributor in the list?

A. Mr. Fleming is looking at this portion of the overall development as part of input to the process, so he will identify to us whether the PRA meets that, meets the needs of input to this seven-step process or whether additional pieces of information will be required to characterize degraded core accidents.

As I said, he's already identified as one of those pieces the potential change for the interfacing system LOCA, there is extensive documentation available on how that analysis is supposed to be done, it's been developed by EPRI, and that he's also performed as part of other PWR risk analysis, so that information would be part of -- in addition to the PRA that existed, would also be an example of things that will be part of

that input to characterize step number 1.

Q. Okay. Looking at step number 2, will you be applying PRA analysis technique to this step?

A. Step number 2 is characterized by the existing probabilistic risk assessment of the Shearson Harris plant, so this information is available for input into the overall process. CP&L has already expended a substantial amount of effort to identify what step 2 is, and that would be part of Mr. Fleming's review to verify that that information is usable for us in this process.

Q. If there is no uncertainty analysis accompanying the results for step 1 and step 2, how is Mr. Fleming going to deal with that?

A. I am not currently able to answer your question because I am not sure that I know that there's no uncertainty analysis.

Q. Assuming hypothetically that there were none, how would you as a professional approach that?

A. In step 1 and 2, Mr. Fleming, in

addition to being an expert in PWR risk assessment, is also a recognized expert in the area of uncertainty analysis and uncertainty characterization, probably second only to Dr. Parry who I think you talked to yesterday. I am relying on Mr. Fleming to provide me with the characterization of the uncertainty associated with the degraded core accident container failure bypass mechanisms.

Q. Is that not your area of expertise?

A. By comparison with the two gentlemen that I said, no, I would certainly not be in the same league with either of those two, but I think that the main purpose of Mr. Fleming providing that information is that he is an expert in PWR parts of the analysis, and we are using the extensive work that CP&L has already performed trying to make sure that that is consistent with the current state of the technology and then using that as an input to this process.

Q. Okay, let's look at step number 3, loss of all spent fuel cooling and makeup systems.

CERTIFICATE OF DEPONENT

I hereby certify that I have read and examined the foregoing transcript, and the same is a true and accurate record of the testimony given by me.

Any additions or corrections that I feel are necessary, I will attach on a separate sheet of paper to the original transcript.

Edward T. Burns, Ph.D.

Date Taken: 10/20/00

Witness: Edward T. Burns

Case: In the Matter of Carolina Power & Light Co.

ERRATA

I, Edward T. Burns, the witness herein, have read my deposition and request that the following changes be made:

PAGE	LINE	CHANGE	REASON FOR CHANGE
1	9	Change "Shearson" to "Shearon"	Typographical
8	19	Change "BWR" to "BWRs"	Typographical
11	17	Change "enterprise" to "Enterprise"	Typographical
13	9	Change "generic letter" to "Generic Letter"	Typographical
13	18	Delete comma between "analysis" and "techniques"	Accuracy
15	16	Change "generic letter" to "Generic Letter"	Typographical
20	3	Delete "were, could and did - - "	Clarification
31	12	Change "was" to "were"	Typographical
31	13	Change "on" to "in"	Typographical
33	15	Change "generic letter" to "Generic Letter"	Typographical
37	22	Change "area were moved from those locations," to "area,"	Clarification
56	15	Change "area" to "error"	Typographical
58	11	Change "could take" to "could not take"	Accuracy

Date Taken: 10/20/00

Witness: Edward T. Burns

Case: In the Matter of Carolina Power & Light Co.

PAGE	LINE	CHANGE	REASON FOR CHANGE
69	11	Change "." to "?"	Typographical
73	1	Change "farther" to "further"	Typographical
77	6	Change "criteria, so" to "criteria. So"	Clarification
81	8	Change "Shearson" to "Shearson"	Typographical
88	22	Change "Shearson" to "Shearson"	Typographical
95	1	Change "Shearson" to "Shearon"	Typographical
102	7	Change "Shearson" to "Shearon"	Typographical
103	8	Change "container failure" to "containment failure and"	Clarification/ Typographical
114	9	Change "Shearson" to "Shearon"	Typographical
119	15	Change "Shearson" to "Shearon"	Typographical

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB MEMORANDUM AND ORDER (RECORD MATERIAL) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

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Docket No. 50-400-LA
LB MEMORANDUM AND ORDER
(RECORD MATERIAL)

Evangeline S. Ngbea
Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 1st day of March 2001