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NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:  
DUKE POWER COMPANY  
(Oconee-McGuire)

Docket No. 70-2623

Charlotte, North Carolina  
Place -  
9 August 1979  
Date -

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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In the matter of: :

DUKE POWER COMPANY : Docket No. 70-2623

(Amendment to Materials License :  
 SNM-1773 for Oconee Nuclear Station :  
 Spent Fuel Transportation and Storage :  
 at McGuire Nuclear Station) :

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Fourth Floor Board Room,  
 Education Building,  
 701 East Second Street,  
 Charlotte, North Carolina.

Thursday, 9 August 1979.

The hearing in the above-entitled matter was  
 reconvened, pursuant to adjournment, at 8.30 a.m.

BEFORE:

MARSHALL E. MILLER, Esq., Chairman,  
 Atomic Safety and Licensing Board.

DR. EMMETH A. LUEBKE, Member.

DR. CADET H. HAND, Member.

APPEARANCES:

On behalf of the Applicant:

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 Debevoise & Liberman,  
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 Duke Power Company,  
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1 On behalf of the NRC Regulatory Staff:

2 EDWARD J. KETCHEN, Esq.,  
3 RICHARD K. HOEPLING, Esq.,  
4 Office of the Executive Legal Director,  
5 United States Nuclear Regulatory Commission,  
6 Washington, D. C. 20555.

7 On behalf of the State of South Carolina:

8 RICHARD P. WILSON, Esq.,  
9 Assistant Attorney General,  
10 Office of the Attorney General,  
11 State of South Carolina,  
12 2000 Bull Street,  
13 Columbia, South Carolina 29201.

14 On behalf of Intervenor Natural Resources Defense  
15 Council:

16 ANTHONY E. ROISMAN, Esq.,  
17 Natural Resources Defense Council,  
18 197 - 15th Street, N.W.,  
19 Washington, D. C.

20 On behalf of Intervenor Carolina Environmental  
21 Study Group:

22 JESSE RILEY, Charlotte, North Carolina.  
23  
24  
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C O N T E N T S

| <u>Witnesses</u>   | <u>Direct</u>   | <u>Cross</u> | <u>Redirect</u> | <u>Recross</u>    |
|--------------------|---|--------------|-----------------|-------------------|
| Clayton Pittiglio  |   | 3594         | 3619            |                   |
| Carrel A. Nash     |   | 3656         | 3719            |                   |
| (Continued)        |   |              |                 |                   |
| T. Jamrell Carter  | 3757  | 3735         |                 |                   |
| William M. McNeill | 3759  | 3761         | 3811            | 3815              |
| Brett S. Spitalny  |   | 3829         | 3834            |                   |
| <u>Exhibits</u>    |   |              |                 | <u>Iden. Evi.</u> |
| CESG 11            | Line drawing of Oconee #1 and #2  |              |                 | 3662              |
| CESG 8             | Duke Power '78 Annual Report  |              |                 | 3671              |
| Staff 24           | Second errata to EIA (Identified off<br>the record 6/7/78)              |              |                 |                   |
| App. 23            | App. responses to NRC questions   |              |                 | 3723 3723         |
| 23A'               | "   |              |                 | 3723 3723         |
| 23B                | "   |              |                 | 3723 3723         |
| 23C                | "   |              |                 | 3723 3723         |
| 23D                | "   |              |                 | 3723 3723         |
| 23E                | "   |              |                 | 3723 3723         |
| 23F                | "   |              |                 | 3723 3723         |
| 23F'               | "   |              |                 | 3723 3723         |
| 23G                | "   |              |                 | 3723 3723         |
| 23H                | "   |              |                 | 3723 3723         |
| CESG 9             | Inv. Rpt. Re: Shipment of radioactive<br>material by Darien Power Co-op |              |                 | 3798              |

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| <u>Exhibits</u> |   | <u>Iden.</u>          | <u>Evi.</u> |
|-----------------|---|-----------------------|-------------|
| 1               | CESG-10                                 | I&E Rpt. 50-409/79-06 | 3800        |
| 2               | Staff 7                                 |                       | 3840        |
| 3               | Staff 13                                |                       | 3841        |
| 4               | Staff 15                                |                       | 3841        |
| 5               | Staff 16A                               |                       | 3841        |
| 6               | Staff 16B                               |                       | 3841        |
| 7               | Staff 17A                               |                       | 3841        |
| 8               | Staff 17B                               |                       | 3841        |
| 9               | Staff 17C                               |                       | 3841        |
| 10              | Staff 18A                               |                       | 3841        |
| 11              | Staff 18B                               |                       | 3841        |
| 12              | Staff 19A                               |                       | 3841        |
| 13              | Staff 19B                               |                       | 3841        |
| 14              | Staff 19C                               |                       | 3841        |
| 15              | Staff 19D                               |                       | 3841        |
| 16              | Staff 22                                |                       | 3841        |
| 17              | Staff 26A                               |                       | 3841        |
| 18              | Staff 26B                               |                       | 3841        |
| 19              | Staff 27A                               |                       | 3841        |
| 20              | Staff 27B                               |                       | 3841        |
| 21              | Staff 28 (SER, re-marked from Staff 20) |                       | 3842        |
| 22              |   |                       |             |
| 23              |   |                       |             |
| 24              |   |                       |             |
| 25              |   |                       |             |

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PROCEEDINGS

CHAIRMAN MILLER: The evidentiary hearing will

Whereupon,

CLAYTON PITTIGLIO

and

DARREL A. KASE

presented the stand on behalf of the NRC Regulatory Staff and, having been previously duly sworn, were examined and testified further as follows:

CHAIRMAN MILLER: Who was examining?

MR. ROISMAN: I was, Mr. Chairman.

CHAIRMAN MILLER: Very well.

CROSS-EXAMINATION (Continued)

BY MR. ROISMAN:

Q I would like to direct your attention to Staff Exhibit 27-A, Mr. Pittiglio, if you please.

Can you tell me, how did it come about that this testimony was prepared?

A (Witness Pittiglio) I was asked to provide some information, or testimony as the case was, concerning the different costs of the ISFSIs. I reviewed the transcripts from the previous hearing, and evaluated the information that was given at that hearing.

At that time I noticed there was a difference in

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WRE/eb2

1 the cost, or an apparent difference in cost, and prepared  
2 this testimony to show or explain what the reasoning for the  
3 cost difference was.

4 Q How long did you spend on the testimony?

5 A Reading the testimony?

6 Q No, preparing this testimony?

7 A I would guess about a week, all in all.

8 Q Can you describe to me how did you go about as-  
9 suming what had been excluded from various estimates of  
10 the costs of an independent spent fuel storage facility, and  
11 how much the value of those excluded items was? What was  
12 your process?

13 A All right. As an example, I refer back to I be-  
14 lieve it was the NRDC exhibit of the Stone and Webster  
15 report which gave an estimated cost of in the middle \$20  
16 million, \$25 to \$28 million, plus the cost of the racks. I  
17 could give you the exhibit number for that.

18 Q I have it, but I think it might be helpful to have  
19 it for the record.

20 A Okay. I believe it was Exhibit Number 10.

21 That exhibit had an attached letter, and I believe  
22 the letter stated that that was for the cost or the esti-  
23 mated cost of the building and racks.

24 Then I evaluated the Duke Power Company estimate  
25 which was Exhibit Number 7, which gave a cost breakdown,

**POOR ORIGINAL**

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WRB/abj 1 including structures, equipment, engineering, labor, over-  
2 contingencies, and interest.

3 I might also add that the EIA had an estimated  
4 cost in it of about \$10,000 per assembly, but that was in  
5 either year, another year's date.

6 These were the numbers that I basically used.

7 Q Did you participate in the preparation of the EIA  
8 estimate of the \$10,000 number?

9 A No, I did not.

10 Q In evaluating the cost of the Stone and Webster  
11 facility, how did you ascertain what had been excluded from the  
12 estimate, what you believe was excluded from the estimate  
13 of the cost of the Stone and Webster facility?

14 A I read the report or the cover letter attached to  
15 the report and discussed it with other people, other members  
16 of the NRC Staff, to see what their opinion was.

17 Q Did you call Stone and Webster?

18 A No, I did not.

19 Q Did you read the file on the Stone and Webster  
20 application for a preliminary design approval to see  
21 whether there was more detail in that file so that you might  
22 ascertain more precisely what Stone and Webster did include  
23 and didn't include?

24 A I did not read the file. I discussed it with the  
25 project manager at that time.

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**POOR ORIGINAL**



NRC/ehc

1 Q And what was the nature of your conversation with  
2 the project manager?

3 A I wanted to determine-- I asked him as far as  
4 the cost -- if the detailed cost breakdown had been furnished,  
5 what the cost was. In other words, was it a final, actual,  
6 good type estimate, or whether it was a general cost esti-  
7 mate as far as the proposal went.

8 He informed me that they had filed this with the  
9 NRC and that it was a general type cost range estimate.

10 Q I see from your resume which is Staff Exhibit  
11 Number 27-B that you worked with Bechtel Corporation for  
12 about eight and a half years, and you worked on various  
13 phases of the design and construction cost estimating, bid  
14 evaluation and construction of nuclear and coal generating  
15 facilities. Is that correct?

16 A Yes, it is.

17 Q If you had been asked by your employer, Bechtel,  
18 to find out for them on a proposal that they had received  
19 to build something that they wanted to build what the item  
20 in question would actually cost them if all costs were in-  
21 cluded, would your process of ascertaining what the cost was  
22 have been different than the process that you went through  
23 in attempting to determine what the cost of the Stone and  
24 Webster item was? In particular, would you have gone to the  
25 bidder?

POOR ORIGINAL

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WRE/eh3 1 A I misunderstood that. I assumed that we were the  
2 bidder, being Bechtel, the way that question was worded.

3 Q No, I'm assuming now that somebody had come to  
4 Bechtel and offered to build something for Bechtel that  
5 Bechtel needed, or to supply something, and your corporation  
6 had said to you, "Mr. Pittiglio, I'd like you to find out  
7 what this is really going to cost us."

8 How would you have done it? Would you have gone  
9 back to the person who made the bid to Bechtel, or would you  
10 have asked the people around Bechtel who had had further  
11 contact with the bidder?

12 A I would have approached it from both viewpoints.  
13 I would have done an independent evaluation of the estimate,  
14 using people at Bechtel, and probably also reviewed cost  
15 estimates that were furnished.

16 Q Well, if the question were particularly what  
17 items were not included in the bid and what items were in-  
18 cluded, if there were any ambiguity, what would be the most  
19 reliable way to find out the answer to that? Ask the bidder  
20 or ask people at Bechtel?

21 A Being that we, Bechtel, were responsible, we'd  
22 use our own information.

23 Q Your own information to find out what the bidder  
24 is deciding to supply?

25 A If his cost came out considerably lower than ours

WRB/eb6 1 on an item that we had a question on.

2 Q In other words, you wouldn't ask the bidder to  
3 clarify and make a firm commitment as to what it was that  
4 they were going to supply you for the price they promised?

5 A Let me back up. I misunderstood.

6 Yes, we would also ask for a clarification in  
7 writing of the bid.

8 Q Why didn't you do that with Stone and Webster  
9 here to find out, given that their price and the price quoted  
10 by the Applicant for the same proposal appears to be markedly  
11 different?

12 A First of all, the context of the letter -- that  
13 would be the September 6th letter of 1978, which was in  
14 that exhibit number, directly from the letter our order of  
15 magnitude figure for the costs are in the mid-\$20 millions  
16 for the facility without fuel racks, and \$5 to \$8 million for  
17 racks, depending on the type, design, and number.

18 The context of that letter indicates to me the  
19 order of magnitude is not a bid type contract figure

20 Q Well, isn't it true that for purposes of this  
21 proceeding, the most reliable information is to know, for  
22 purposes of making a choice among alternatives, how much each  
23 alternative is going to cost?

24 A That is true. However, the Stone and Webster  
25 report or proposal was based on being dependent on certain

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WRB/el 7 1 parent facilities. It is not a totally independent facility  
2 And I do not see how, with the time period that we had, that  
3 there was time to reanalyze the parent facilities to  
4 determine whether they were adequate or not.

5 Q I'm sorry, you said you didn't see where there  
6 was time with the time that you had. To what are you re-  
7 ferring now?

8 A Well, you asked me why I didn't go back to Stone  
9 and Webster. I would have had to propose the question, would  
10 this cost be for the Duke Power system for Oconee, and would  
11 the interface of the radwaste, solid wastes, liquid rad-  
12 waste, fire protection, makeup water, electrical communica-  
13 tions systems, which were dependent upon the Oconee system,  
14 would they be adequate to evaluate that number.

15 We would have to know whether those systems were  
16 adequate or not.

17 Q I don't understand. What's this thing about time?  
18 That's what I'm trying to understand. Whose time are we  
19 talking about? What do you mean, didn't have time?

20 A Well, I think that this type of analysis would take  
21 a considerable amount of time, meaning months.

22 Q If you had it, would you know more precisely the  
23 cost of the Stone and Webster option as a way of dealing with  
24 the spent fuel storage problem at the Oconee facility?

25 A If I had the time and my management could talk

POOR ORIGINAL

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WRB/ebg 1 Stone and Webster into providing the information, yes.

2 Q Well, you were at Bechtel. What is your judgment  
3 as to the likelihood that someone whose proposal might end  
4 up being approved by a Licensing Board as the best alterna-  
5 tive, what do you think is the likelihood that Stone and  
6 Webster would have voluntarily wanted to provide that infor-  
7 mation?

8 MR. KETCHEN: Objection, Mr. Chairman.

9 CHAIRMAN MILLER: Why?

10 MR. KETCHEN: It's the form of the question. I  
11 don't think this Licensing Board would be in a position to  
12 approve that at this point. The question of the Stone and  
13 Webster design is not before this Board for approval.

14 CHAIRMAN MILLER: It's a question of the cost, as  
15 we understand it, and the cost of a possible alternative  
16 method. And it's on that basis that we'll let the witness  
17 answer.

18 WITNESS PITTIGLIO: Let me back up for one second.  
19 I think maybe the question is coming because there appears  
20 to be a large difference between the Stone and Webster and  
21 the Duke facility.

22 Is that what you're originally questioning me  
23 about, why I did not --

24 BY MR. ROISMAN

25 Q When I read your testimony there doesn't appear

WRB/ab9

1       to be a large difference at all. I'm trying to find out, at  
2       the initial stages, how you justified the way you went about  
3       deciding that you didn't think there was a large difference.

4               I don't want you to start anticipating where I'm  
5       going; I just want you to answer my question.

6               A       (Witness Pittiglio) I apologize.

7               Q       Don't apologize. I want you to understand the  
8       groundrules under which I'm asking you the questions.

9               A       Would you mind repeating the question?

10              Q       Essentially what I'm saying is that given your  
11       experience with Bechtel, which was, like Stone and Webster,  
12       someone who built things for other people, what do you think  
13       is the likelihood that Stone and Webster would have been un-  
14       willing to provide the level of detail we're now talking  
15       about if they thought there was the possibility that in this  
16       licensing hearing this Board might find that the alternative  
17       to building an independent spent fuel storage facility of  
18       the type Stone and Webster was proposing was preferable to  
19       transshipping spent fuel from the Duke facility?

20              A       My personal feeling is that Stone and Webster  
21       would not have been overly cooperative in providing that in-  
22       formation. Remember, Stone and Webster was not the original  
23       designer to the Duke facility and therefore, a considerable  
24       amount of money or resources would have to be spent to evalu-  
25       ate this proposal.

WRB/ebLG

Q Now when you make that statement you're talking about going from what's in NRDC Exhibit Number 10 to a complete design and a specific bound under a contract bid, to move from that point to the more detailed point? That's what would cost a lot of money?

A That would definitely cost a lot more money.

Q Do you think it would cost a great deal of money for Stone and Webster to have provided the Staff with an estimate of what they thought it might cost to -- again still in the order of magnitude figures, but attempt to evaluate on a preliminary basis the fit between the Stone and Webster proposal and the Oconee units?

A I really couldn't give you a dollar value. I will say that I feel it would be less than a detailed cost.

Q Haven't we had testimony in this proceeding, both from the Applicant and the Staff witnesses, regarding that very question, that is, the fit that one might have with an independent spent fuel storage facility such as Stone and Webster's with the Duke facility? Isn't that correct?

A I believe that's correct.

Q And is it your understanding that to prepare that testimony took a substantial expenditure of money or time?

Let me withdraw that.

Isn't it your recollection that almost all that testimony came out in the form of responses to questions on

1.180

**POOR ORIGINAL**

WRB/eb11 1 cross-examination?

2 A Yes.

3 Q So that it spent only the amount of time it took  
4 for the witness to think about the question and give an  
5 answer, didn't it?

6 A It did for them, yes.

7 Q And that involved essentially looking at some of  
8 the drawings which we have seen, either introduced into evi-  
9 dence here or a part of the over-all docket for the Duke  
10 facility. Isn't that true?

11 MR. MC GARRY: I'll object to the question and the  
12 previous question, and request they be stricken from the  
13 record. It's premised upon what the previous witnesses'  
14 thought process was, and I don't believe that this witness is  
15 qualified to address that matter.

16 CHAIRMAN MILLER: Well, we won't permit any wit-  
17 ness to testify to the thought processes of another. However,  
18 we did interpret the question to mean that which this wit-  
19 ness observed from the testimony of the others, and the data  
20 which they professed to have before them.

21 Are you able to answer without trying to look into  
22 their skulls, Mr. Pittiglio?

23 WITNESS PITTIGLIO: No, I really cannot.

24 CHAIRMAN MILLER: If you can't, then we'll sustain  
25 the objection.



WRB/a:12

BY MR. ROISMAN:

1 Q Mr. Pittiglio, when did you first begin your work  
2 with respect to the Oconee application for transshipment of  
3 spent fuel to the McGuire facility, roughly?  
4

5 A (Witness Pittiglio) Roughly March or April, about  
6 the same time that Dr. Nash started working.

7 Q So you were not involved in any way in the prepara-  
8 tion of the Environmental Impact Appraisal or the early  
9 analysis that were done by the Staff?

10 A No, I was not.

1b file.

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lb wrb/agbl

Q Do you know who did the portion of the Environmental Impact Appraisal that dealt with the independent spent fuel storage facility cost estimates?

A No, I do not know who did the initial work.

Q You testified before that you talked to them. Who did you talk to?

A I talked to Mr. Spitalny and Mr. Roberts.

Q But you do not know whether they were the ones who actually did the work that's contained in the EIA on that subject?

A No, I do not.

Q Are you adopting in any way any portions of the Environmental Impact Appraisal as your own testimony?

A No, I am not.

Q So your testimony is limited to Staff Exhibits 27A and 27B?

A Yes, it is.

Q Now I notice that for purposes -- in the answer to the first question in Staff Exhibit 27A, you relied upon Applicant Exhibit Number 7 for purposes of evaluating the cost of an independent spent fuel storage facility if Duke were building it themselves, is that correct?

A Yes, it is.

Q Can you tell me, why didn't you use Applicant's Exhibit Number 1, which is their update of that study

wrb/agt2

1 dated June 15, 1979, and used instead the 1976 study?

2 A The reason that I used the 1976 study to evaluate  
3 it was the '76 study had a more detailed breakdown of costs,  
4 I believe in Table Four.

5 I also personally had some problems with the  
6 Applicant Number 1, especially Part D. Therefore, I relied  
7 on the initial more detailed report.

8 Q Now looking at the bottom of page one and the top  
9 of page two of Staff Exhibit 27A, you identified in a very  
10 generalized way what the cost of the Stone and Webster pro-  
11 posal doesn't include and what the cost of the Duke facility  
12 would be if you excluded those items. Is that a correct summary  
13 of what you're attempting to do there?

14 A Yes, it is.

15 Q Fine.

16 Can you describe to me exactly how you went about  
17 placing the various items into these categories? In other  
18 words, how did you find the parallels between the Stone and  
19 Webster proposal on the one hand and the Duke proposal as  
20 spelled out in Applicant's Exhibit Number 7?

21 A Let's start with the Duke Power Company Exhibit  
22 Number 7.

23 Q All right.

24 A That gave a detailed breakdown.

25 Q Can you direct me to the portion of the report

wrb/agb3

that we ought to be looking at to see that breakdown?

A Okay.

Q Is it Table Four?

A Yes, I believe it is Table Four. I'm trying to locate it myself.

(Pause.)

I'm still having a problem trying to find a copy of that table.

Q Look about six pages from the back of the document, or five pages from the back of the document.

A Okay. Table Four, okay.

Q Is that the one that you want to refer us to? I had merely suggested it. I don't want to pin you down to it.

A Yes, that's the table with the total that says, at line D, of \$44,315,000.

Q That's correct.

A That is the number for the total. That's the table.

Q All right.

Now when you did the estimates that you've made at the bottom of page one and the top of page two of Staff Exhibit 27A, describe to me what did you do, how did you get that information out of Table Four for purposes of the Duke facility estimate at the top of page two of \$23,070,000?

wrb/ago 4

1 A Okay. Let me explain it.

2 First of all, the figures in Table Four are 1976  
3 dollars.

4 Q Okay.

5 A So they were escalating at approximately 6 percent  
6 a year, to put them into the 1978 year.

7 Now, the breakdown of the items as far as the  
8 \$22,070,000 is a total -- I'm looking for another piece of  
9 information that I have up here that was also provided.

10 I don't know whether you have it, but in the  
11 same section that has the Table Four, in the initial part are  
12 some questions and responses. If you look at question seven --

13 Q You're talking now about Applicant Exhibit Number  
14 Seven?

15 A I believe it is number seven. Is that the letter  
16 from Duke Power Company? Look at page five, the first five  
17 pages.

18 Q No, I'm afraid what you have is not Applicant  
19 Exhibit Number Seven, but the letter to which Applicant Exhibit  
20 Number Seven was attached.

21 A Yes, that's what I have. I'm sorry about that.

22 Q That's all right.

23 You're looking at page five of the responses?

24 A Yes, the response to question number seven.

25 A (Witness Nash) It's the fifth page, including the  
cover page.

wzb/agh5

Q I hav eit. Go ahead.

A (Witness Pittiglio) I took the structure and equipment which is given in 1976 dollars and escalated them at 8 percent a year to the reference year in the testimony.

Q Okay.

Now how did you ascertain that the Stone and Webster figures only covered two items, structure and equipment, that Duke had cut?

A From the cover letter attached to the Stone and Webster report.

Q Could you point me to the language of the cover letter that you're relying upon?

A The third paragraph:

"Our order of magnitude figures for costs are for the mid-20 millions for the facility without racks and five to eight million for racks depending upon type, design and number."

Q What part of that paragraph tells us that they did not include engineering, labor or overhead in the estimate they're giving?

A My interpretation of that paragraph indicated that -- let me qualify it also by saying that even if Stone and Webster is to design and build the facility, Duke is still forced to do their analysis on their existing facility systems

wrb/agb6

1 and still has their own overhead contingencies and interest  
2 to deal with.

3 Q Before we get to that -- and I'm going to want you  
4 to get back and tell me what the estimate of that would be --  
5 I'm still trying to find some language that I, as a layman,  
6 can find in that letter on NRDC Exhibit Number 10, the cover  
7 letter, that would lead me to conclude that Stone and Webster  
8 did not include engineering, labor and overhead costs that  
9 it would incur in providing the facility that is described in  
10 that exhibit.

11 A Again I can only say that my basis was this  
12 paragraph plus discussion with the project manager.

13 Q With Mr. Spitalny you mean?

14 A I believe Mr. Roberts was the project manager of  
15 the --

16 Q I'm sorry, I thought you meant for this project.  
17 You mean for the other project?

18 A Right. And I believe Mr. Clark, with whom we  
19 first discussed it, provided a little information. That's how  
20 we got to Mr. Roberts.

21 Q Can you remember anything from the conversation  
22 with MR. Roberts that would shed more light on how one  
23 ascertains from the Stone and Webster proposal as submitted  
24 in NRDC Exhibit Number 10 that they have not included the  
25 costs for engineering, labor and overhead?

wrt/aga7

1 A Yes, I believe there was a discussion that,  
2 I'm not positive, but that he had received even a more detailed  
3 list breakdown of equipment and materials as far as the  
4 facility went from Stone and Webster.

5 Q Well if he had a more detailed list of equipment  
6 and materials, would that necessarily be excluding engineering  
7 labor and overhead?

8 A Who's engineering, labor and overhead?

9 Q Stone and Webster's.

10 A It may not exclude it. I don't know. I honestly  
11 don't know.

12 Q Okay.

13 Now you said that you felt confident that the Stone  
14 and Webster estimate wouldn't have included Duke's engineering  
15 labor and overhead. Can you describe to me what is the process  
16 by which you assumed Stone and Webster would install an  
17 independent spent fuel storage facility of the type described  
18 here at Duke that would have required Duke to spend engineering  
19 labor and overhead with respect to that facility?

20 A Well someone would have to provide Stone and  
21 Webster with design parameters and information concerning the  
22 parent facility.

23 Q What do you estimate that might have involved  
24 of the total engineering costs associated with the construction  
25 of a facility like the Stone and Webster one, what percentage



wrb/acb8

1 of the total engineering cost would you say?

2 A That would be only the beginning.

3 Q I'm sorry, that would be the beginning of the --

4 A Of Duke's effort.

5 Q Go ahead and describe all of Duke's effort, then.

6 A Duke would probably have to -- they would have  
7 to supply the information. After they received information  
8 back from Stone and Webster, they have to re-analyze their  
9 existing systems, which would probably have to be through  
10 the original architect or architect-engineer.

11 Q You say would probably have to. Are you now  
12 describing to me the standard practice or the practice as you  
13 expect Duke would use it, or what must be done under any  
14 circumstances as sound engineering practice?

15 A Sound engineering practice would have to evaluate  
16 the systems to guarantee their accuracy for the safety of the  
17 facility.

18 Q With this kind of a proposal who would normally  
19 do that, the person proposing to build the additional facility  
20 or the person who owns the facility to which the additional  
21 facility is being attached?

22 A In this proposal -- I read it from the quali-  
23 fications that the proposal was based on the adequacy of four  
24 or five facilities or the parent facility.

25 I mean, from what it read this contract or proposal

wrb/agb9

1 was based on, these systems worked, this is what you have.  
2 Otherwise, they would have to evaluate the systems before they  
3 could present the contract.

4 Q All right.

5 But does it necessarily follow that Stone and  
6 Webster is expecting the utility will be the one who will do  
7 the engineering work of making sure that those systems match  
8 well with the independent spent fuel storage facility?

9 A No, it does not necessarily follow that.

10 Q What about the item labor? What is your --  
11 well wait, before we get to that.

12 Was there more engineering that you thought Duke  
13 would be doing?

14 A Yes, I felt that -- are we talking about the labor  
15 on Duke's own report now or --

16 Q No, I withdrew the question on labor and went  
17 back to engineering again.

18 What we're assuming is that Stone and Webster  
19 and Duke enter into a contract for Stone and Webster to provide  
20 the facility that they've outlined in NRDC Exhibit Number 16  
21 for the Oconee Plants.

22 And I'm now trying to get some idea of how much  
23 engineering you feel Duke would do as you understand the  
24 proposal that would be a cost that would have to be added  
25 to the Stone and Webster proposal.

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A When you say how much, I'm not sure whether, you know, I can give you a dollar value or hours.

Q Well that's what I was trying to get you to first describe that for us, so we'd have some understanding of what it was.

A I think that the Duke engineering staff would have to evaluate the design, they have to analyze their existing systems, they have to re-evaluate the foundation and soil conditions at the site to provide the information for the design of the system, okay?

Q Okay.

A They have to make sure that there will be no overburden or surcharging to the additional structures from equipment, so they would probably have to re-analyze some foundations if the facility was fairly close to an adjacent facility. And I would imagine that they would supervise or overview the entire construction project, being that it was adjacent to an operating reactor of their own.

Q Do you have some feeling as to what percentage of the total engineering, labor and overhead that would represent? Is the bulk of the engineering, labor and overhead the work associated with the design, physical construction of the independent facility, is that where the bulk of those costs would be?

A Yes.

wrb/ag011

Q 60-70 percent maybe, in that area?

A I would say probably even less, probably less than 50 percent of the total labor.

Q I'm sorry. Now I'm afraid we're getting confused by percentages.

Looking at the line item engineering, labor and overhead as it appears on the response to question seven which is attached to the April 23, 1979 letter of Duke Power to William Dircks, what percentage of engineering, labor and overhead would you expect would be that which would be associated with the physical construction of the facility that Stone and Webster has proposed and that would have to be work done by the contractor, as compared to the amount of engineering, labor and overhead that would be done by the recipient organization?

A Let me try to answer that question as best I can. I would feel that probably in engineering-labor we're talking about a third of that amount, 33 percent or if they show \$14 million, probably \$5 million in labor over the three or four years the facility is constructed.

The overhead is a difficult question because they're responsible for providing security -- security checks associated with that particular plant, and that would be a problem with the amount of craftsmen and equipment entering and out of the job site, and I wouldn't really be qualified

wab/agbl2

1 to give you estimate on that.

2 Q Well let's take a look at Table Four in Applicant's  
3 Exhibit Number Seven for a moment.

4 NOW as I understand it, the items listed on Table  
5 Four as 10, 11, 12 and 13 are the items that we're now talking  
6 about, and that the total that Duke Power estimated for the  
7 building of an independent spent fuel storage facility which  
8 included field overhead and material, field labor, field  
9 overhead labor and engineering for the entire facility  
10 including all of the design work that had to be done with  
11 respect to the site specifically and all the design work  
12 and labor on building the facility itself was \$12 million  
13 dollars or so in 1976 dollars, and it's that number that  
14 you escalate to something like \$14 million in your analysis  
15 is that correct?

16 A Yes, that's correct.

17 Q And they've got an item there of field labor  
18 of something like \$5 million, is that correct?

19 A Yes, that is correct.

20 Q Now is the bulk of the field labor work that  
21 would be done by the person actually building the independent  
22 spent fuel storage facility or by Duke Power?

23 A Field labor would be done by the one building  
24 the facility.

25 Q All right.

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And the field overhead labor would be a percentage of that item. I assume all of that would also be done by the person building the facility, is that a reasonable assumption?

A That is a fairly reasonable assumption.

Q Okay.

Now field overhead material, what is that -- do you know what that item means. I understand what it represents, it's 10 percent of the total materials that are outlined in items one through nine, but what is overhead for material, what does that mean?

A My understanding would be that the overhead materials would consist of cranes, trucks, shuttles, additional equipment that may be necessary for a labor force to complete the job.

Q Would that normally be supplied by the person building the facility?

A It would be -- not necessarily on a nuclear facility.

Q I'm sorry?

A Not necessarily at a nuclear power plant.

Q Well what would be the factors that would enter into whether it would or wouldn't?

A Well the problem is depending, you know, where they're working.

Now let me go back. There's probably no problem

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as far as exposure or contamination of any of the equipment. However, a lot of the subcontracts will require the operator of the plant or the owner to provide the equipment, so that if there's any problem with the equipment not being able to be removed from the job site for continual use.

Q Can you tell from the Stone and Webster proposal in NRDC Exhibit Number 10 whether they're proposing to provide their own field equipment such as you just described or whether they are depending upon the utility to provide it?

A Well I think we're getting into a problem, because Table Four is the Duke Power estimate, their own estimate of a totally independent facility which includes no re-analysis of the existing parent facilities, okay?

Q Right. But you understand so far I've only been asking you questions about items 10, 11 and 12.

A I realize that.

Q Things other than engineering.

A Right. But they're also using in all probability their own cranes and equipment available at the site and charging that portion of the use to the facility, whereas Stone and Webster is either forced to purchase the equipment or contract it or rent it and the total costs would have to go into the Stone and Webster report or cost estimates.

Q So in other words you mean that Stone and Webster's estimate in NRDC Exhibit Number 10 of the cost of building the

WRD/abls  
1 semi-independent spent fuel storage facility that it proposes  
2 probably, if broken down, would show for the field overhead  
3 material a higher number than what Duke has shown here because  
4 it may be costing Stone and Webster more money to provide  
5 that portion of the construction costs that Duke might have  
6 to spend itself, is that your testimony?

7 A Yes.

8 Q Now let's look at the last item, the engineering  
9 figure. That's the one where I gather you feel Duke itself  
10 might have to do a substantial piece of the work, even if  
11 Stone and Webster is providing the item, is that right?

12 A If Stone and Webster is going to contract for  
13 an independent spent fuel facility that has dependent related  
14 items.

15 Q Okay. Can you give us a ballpark estimate, how  
16 much of the total engineering would you expect Duke would  
17 probably have to provide itself?

18 A It would be difficult, if not impossible, for  
19 me to evaluate the cost of the re-analysis of the systems.  
20 It may well be more than the initial cost of the design of  
21 the facility. I think Duke would be the only one who could  
22 answer that question.

23 Q Will you bear with me just one second, please?

24 (Pause.)

25 Can you get in front of you a copy of the



Environmental Impact Appraisal and look at page 53?

Do you have that in front of you?

A Yes, I do.

Q The second full paragraph is discussing the feasibility of re-racking spent fuel pools serving Oscnee Units 1 and 2. Let me just give you the background in case you haven't picked it up.

This was written at a time when the Staff did not know whether the pools 1 and 2 would be re-racked at all, and the analysis contained here is dealing with re-racking of -- that night, in fact, be the present re-racking or arguably could have been poison re-racking. Just so you have that understanding.

If you look about four lines -- six lines down in the paragraph, there's a statement:

"Presently the pool has two cooling trains, cooling capacities of" -- I'm not going to try to read that, you can see what it says. And then the next sentence: "And an additional" -- and some more cooling capacity would be required to meet maximum load requirements if the pool were to be re-racked.

Are those the kinds of analyses of capacities of the existing systems to withstand additional loads on them that you're talking about now that you think would have to be done if you did a Stone and Webster-type operation?

wrb/agbl 7

1 A Yes.

2 Q And that is the kind of analysis that you feel  
3 would take a fairly substantial amount of engineering effort  
4 to be able to ascertain whether or not the load that would be  
5 imposed on the system was greater than the system could handle?

6 A Yes. I'm not sure what that analysis consisted  
7 of.

8 Q Well I was going to ask you if you'd done any  
9 assessment of -- do you think that if what you wanted to find  
10 out were how much you could re-rack the Oconee 1 and 2 spent  
11 fuel pool without exceeding the capability of their existing  
12 cooling system, would you consider that a relatively compli-  
13 cated process to discover that information or a fairly  
14 simple one?

15 A To determine possibly the existing capacity  
16 of the existing Oconee pool may not be an extremely difficult  
17 problem. What you could do is go to the design parameters  
18 and take it to its maximum and work back to capacity and you  
19 never exceed the capacity of the system that way, you're  
20 always within the maximum allowable.

21 Q Would that be equally true for the Stone and  
22 Webster proposal if the proposal would not exceed the capa-  
23 cities of the systems now at Oconee? That is, that it would  
24 be a relatively simple task, you would go to the design  
25 specifications and find out what is the system capable of

wrb/agb18

holding, do we have enough excess here to add this additional  
whatever we're adding?

A I would agree that you could determine whether you  
exceeded the excesses fairly easily. However, you are going  
from a 300 or 400 assembly pool now to a facility that has  
1500 or 2300 as the Stone and Webster report shows.

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1C VRB/wb1

1 I doubt seriously that if you did initial  
2 designs for four or five hundred assemblies that there's a  
3 factor of 5 or so extra in the original analysis.

4 Q So you would anticipate that the excess engineering  
5 effort would be the effort required to redesign the systems  
6 that were in the parent plant to be able to have the capacity  
7 to pick up the load of the new system rather than finding  
8 out whether those systems as initially designed were adequate  
9 to handle the load?

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10 A Yes, that's correct.

11 Q Now, do you understand that on page 6 of the  
12 Stone and Webster report, which is attached to the letter  
13 which is the cover of NRDC Exhibit 10 -- I'll give you a  
14 moment to get that in front of you.

15 Do you have that?

16 A I have it somewhere. I've got so many papers  
17 scattered around up here. I know I had it, because I just  
18 referenced-- It's the September 6th letter. Okay.

19 Now what page?

20 Q Page 6 of the report that's attached to the letter.

21 A Page No. 6 is blank on mine.

22 Q Blank?

23 The same people who build power plants do xeroxing,  
24 I believe.

25 MR. MC GARRY: I move to strike that remark.

WT. / vol 2 1

CHAIRMAN MILLER: It will be stricken.

2

BY MR. ROISMAN:

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Q I'm showing you NRDC Exhibit No. 10 and am now directing your attention to page 6.

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You'll notice there's a small paragraph at the top. I think if you look at yours you can see how yours get cut off a little bit there.

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Would you just read the paragraph?

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A "The ISPSF is nominally an independent facility, but it uses existing parent plant systems and personnel to minimize cost where possible, consistent with the near universal siting criteria."

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Q Do you understand that to mean that Stone and Webster believes that it should be cheaper overall to utilize their system with an interface with the plant than it would be to build a completely independent system; is that your understanding of what they are claiming there?

19

20

A When the facilities, the parent facilities are adequate.

21

Q All right.

22

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Now do you think that they were assuming they would find a substantial number of parent facilities that could handle 3, 4, 5 times as much spent fuel in an adjacent facility than they were originally designed to hold?

WRI/wb3

1 A I don't really know how much extra leeway they  
2 anticipated. I would gather from that statement they feel  
3 there is some additional capacity available.

4 Q With your knowledge of Stone and Webster, would  
5 you as an expert feel that they are likely to have a fairly  
6 good handle on that, as to what the excess capacities might  
7 be?

8 A I think they probably do, for a generic basis.

9 Q I understand. Okay.

10 Did you, by any chance, do any kind of an analysis  
11 of the Duke Oconee units to see whether the systems with  
12 which a facility such as Stone and Webster's would have to be  
13 interconnected, what their design capacities were and how  
14 much excess they had?

15 A I did not do any analysis. I did discuss it with  
16 Mr. Spitalny and Mr. Roberts to try to get background infor-  
17 mation to determine whether the system was adequate.

18 I believe there was some problem in the cooling  
19 system.

20 Q That may be what we have just been talking about  
21 in the Environmental Impact Appraisal, perhaps.

22 A Right. I think that the testimony from the  
23 previous time we were here also -- there was something to the  
24 effect that there was a 5-million-dollar cost concerning  
25 cooling system modifications. I'm not positive on that.

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WRL/wb4 1

Q Okay. All right.

2

Now on page 2 of Staff Exhibit 27A, the first full paragraph begins, "As shown by these costs," and then you get down to "...the Environmental Impact Appraisal presents the cost figure as a result of independent studies done at an earlier date of \$10,000 per assembly."

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What assemblies are you referring to?

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A In the EIA they referenced a 10-thousand-dollar per assembly cost.

9

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Q Right.

11

A I went to Mr. Spitalny to determine how that cost was arrived at and what it consisted of. He informed me that that cost was basically for equipment to -- you know, the equipment and structure, or just the equipment necessary; not total cost including contingencies, interest and what-not. I just accepted that.

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Q What did you mean by "independent studies?" Whose independent studies?

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A The NRC's independent study.

20

Q And when you used the word "studies" did you mean to imply some sort of a written document that had been prepared?

21

22

23

A Some type of analysis, not necessarily written, but probably. I meant that--

24

25

Q You don't have any independent basis to know the

WRB/wb5

1 reliability of that; is that correct?

2 A I do not.

3 Q Now you then next refer to the DOE cost estimate  
4 in the couple of sentences down in the same paragraph, "...when  
5 put into proper perspective results in similar expenditures."

6 What did you mean by that?

7 First of all, what is the DOE cost estimate to  
8 which you refer?

9 A The DOE estimate was a number that was presented  
10 in one of Mr. Spitalny's charts in his testimony.

11 Q That's the 7 to 12 thousand dollar per assembly  
12 number?

13 A Right.

14 Q Okay.

15 And what do you mean "put into proper perspective?"

16 A My discussion with him -- and I believe we looked  
17 at another DOE report, and I don't know the name or the  
18 number -- indicated, he indicated to me that that was strictly  
19 for the equipment and structure, that 7 to 12 thousand dollar  
20 cost shown in his table.

21 By "proper perspective" I mean now that I was  
22 trying to evaluate everything exclusive of interest, con-  
23 tingencies and overhead.

24 Q Isn't it true that the DOE cost estimate is based  
25 upon a proposed fee that DOE was proposing to charge for the



WDR/wh6

1 use of its independent spent fuel storage facility if it were  
2 to build one and utilities were to come and use it?

3 A I honestly don't know. I think maybe Mr. Spitalny  
4 could answer that question very easily.

5 Q Now down at the bottom you use this phrase, and  
6 I'm just trying to get some idea of your -- some parameters,  
7 some qualitative parameters on it. --quantitative parameters,  
8 I mean. "The Duke Power Company estimate is very much in  
9 line with...." This is at the bottom of the same paragraph  
10 we've been talking about.

11 What does the range of differences have to be for  
12 them to still be "very much in line with," in your judgment?

13 A In my judgment, the per assembly costs were  
14 within a range of 15 percent, possibly as high as 20 percent  
15 for facilities which have never been constructed. There is  
16 no facility at this time, as was mentioned yesterday, that  
17 has been constructed to date; therefore, a range of approxi-  
18 mately 20 percent appears to be, to me, a reasonable number.

19 Q Well, how different is an independent spent fuel  
20 storage facility of the type that one would want to build at  
21 Oconee from the kind of spent fuel storage facility that was  
22 built by General Electric at Morris that's now being used for  
23 the storage of spent fuel, or the one that has been built at  
24 Barnwell but has not yet been used?

25 A I've not reviewed the drawings, engineering drawings

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1 of any type for either facility. I'm really not familiar  
2 with them, to evaluate them and compare size or different  
3 parameters to the facility of Duke.

4 Q So you don't really know that there has been none  
5 built comparable to the type that one might want to build at  
6 Oconee? Isn't that correct?

7 A Other than the testimony that we heard at this  
8 hearing.

9 Q Yes, I meant on your own you have no --

10 A No, I do not.

11 Q Now at the bottom of page 2 of Staff Exhibit  
12 27-A you list the systems that are not included in the  
13 Stone and Webster cost estimate: solid waste, liquid rad-  
14 waste, fire protection, makeup water, electrical communica-  
15 tions, and security, and you say if those were included, the  
16 costs would increase.

17 Did you attempt to quantify how much you thought  
18 the costs would increase if those items were included?

19 A No, I did not attempt to quantify it. I only  
20 mentioned that they would increase to show that right now the  
21 cost per assembly is less than the Duke within the 20 percent  
22 range, but it was based on the five facilities being  
23 adequate.

24 Q But those items you've listed there, they might --  
25 You have no way to say they wouldn't, is what I'm asking--  
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WRB/eb2

1 Strike that.

2 Do you have any way to say that if those items  
3 were included, the cost would not still be very much in line  
4 with the cost estimate that Stone and Webster has made?

5 A Other than the estimated cost to modify the  
6 cooling system, as an example, for the Duke facility, right  
7 now I do not.

8 I might say that if the facilities were adequate,  
9 it is true that the costs would not increase if the parent  
10 facilities were adequate.

11 Q The list of things you've listed here, unless I'm  
12 mistaken, does not include the cooling system, do they?  
13 That's not one of the items that --

14 A No, it is not.

15 Q Is it your understanding that the Stone and  
16 Webster proposal intended that the cooling for the new system  
17 would be supplied by the parent facility and that basically  
18 all they would build is a swimming pool without a cooling  
19 system, or did you understand their design was intended to  
20 include the cooling as part of the design?

21 A I understood that the cooling was part of the  
22 design. I only used the \$5 million as an example of a cost  
23 figure for a modification to the facility.

24 Q But would you say that modifying the cooling system  
25 of the facility might be one of the larger of the items as

WPS/er3

1 between if we looked at now six instead of five cooling sys-  
2 tems, solid wastes, liquid radwaste, fire protection, makeup  
3 water, electrical communications and security and cooling,  
4 that one of the biggest, if not the biggest item if you had  
5 to modify it, would be the cooling system cost?

6 A Yes, I agree.

7 Q And these would be smaller costs?

8 A Yes, I agree with that.

9 Q All right. Let's look at page 3 now of Staff  
10 Exhibit 27-A.

11 The first sentence of the response:

12 "The physical layout of the existing  
13 structure prohibits expansion of the pool in a  
14 manner posed by CESH. There is available space,  
15 however, to proceed at a right angle to the exist-  
16 ing pool."

17 Did you take a look at the physical layout of the  
18 Oconee facility in order to make the statement that you make  
19 there, or are you relying on somebody else for that?

20 A I went over and visited Mr. Spitalny and  
21 Mr. Roberts to see if they had an engineering drawing layout  
22 of the pool. They did. And I spent a few minutes looking at  
23 the pool to determine if that was the case or not.

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Q If you were being asked by Duke Power Company to tell them whether or not the pool could be expanded and if so in which direction, would you have wanted to go and physically look at the facility itself to ascertain that, or would you have used the drawings?

A I think that I would -- either method. However, I must admit that there may be some small equipment at the facility which is not shown on the engineering drawings which may even complicate it greater.

Q Or it may be that when actually built it was built in a different way, and it might be less complicated. Isn't that also possible?

A I don't think so, because of the nuclear requirements of the structure, as far as the drawings. Once the PSAR and the PSAR and all the drawings are filed, and because of the QA and so forth at the job site, I would find it very difficult to believe that that building was located anyplace other than where the drawings showed it.

Q But I was thinking more of the equipment that's adjacent to the building that might interfere with the potential for expansion of the pool, is what I was thinking of.

A All right. I agree with that.

Q All right. In the next paragraph on page 3 of Staff Exhibit 27a, you appear to make an assumption that there

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1 is no way, absent the existence of an already built in  
 2 expansion gate or canal to the existing pool, to have a spent  
 3 fuel pool that is physically connected to the existing pool.

4           A: I correct that you have made that assumption?

5           A: Yes, I made the assumption that -- that's correct.

6           Q: What is the basis for that assumption?

7           A: When you say connecting, we're now talking about  
 8 a breaching pool?

9           Q: I'm talking about having a pool such that you  
 10 would never have to remove the spent fuel from water and put  
 11 it into a cask in order to move it into the expansion space,  
 12 but could move it through a water canal or just into another  
 13 pool that was physically attached.

14           A: Yes. I made the assumption because I feel that  
 15 it's extremely difficult to penetrate the pool liner and  
 16 maintain the existing integrity of the pool.

17           Q: What is your basis for that conclusion?

18           A: Well, let's step back a second. Did you do an  
 19 analysis in order to reach that conclusion?

20           A: My analysis was based on the experience I had in  
 21 the design and construction of a spent fuel building for the  
 22 SNPPS project.

23           Q: Did you, in designing that, investigate the  
 24 possibility of a subsequent breach of the pool for purposes  
 25 of expansion?

0 A When I designed that -- and I did a considerable  
1 amount of the design -- I remembered the problem it had with  
2 the foundation, and to put an existing structure adjacent to  
3 that building would require excavation adjacent to the  
4 existing building.

5  
6 Assuming, now, that you're using that same wall  
7 to provide a penetration, that type of excavation alone is  
8 a major problem that requires probably underpinning the  
9 existing pool. You'd have excessive vibrations from equip-  
10 ment, depending on the type of soil -- if there's rock, you  
11 may even have to blast to get down to the same depth. You'd  
12 have problems with differential settlement of the fuel pools.

13 This was just based on experience that we've  
14 had in working in areas where you're adjacent to another  
15 structure. That's how I made my judgment.

16 Q So the factors, as I understand, that you've  
17 listed, we've essentially called site specific factors, is  
18 that right? That it would depend on the bedrock and the  
19 extent to which the already existing facility was vulnerable  
20 to the vibrations, or would require underpinning, is that  
21 correct?

22 A That is one aspect of it. I think that the  
23 other aspect would be the fastening of a liner plate to an  
24 existing concrete structure. Therefore, no plates are  
25 embedded in the wall, and you're forced to anchor it into the

1 existing structure, which has never proven to be an acceptable  
2 method.

3           Again, those types of problems. Problems with  
4 cranes that are specifically connected to the building, as  
5 far as being able to transfer through that, and the site  
6 conditions, were why I eliminated that.

7           Q       But the site conditions that you were talking  
8 about are ones that would depend upon analyzing that particular  
9 site, isn't that true?

10          A       Yes, that is true.

11          Q       And you had not done that for the Oconee site,  
12 is that --

13          A       No, I did not.

14          Q       Now, the other aspect of it that you're talking  
15 about, I think you said about attaching a liner to an already  
16 existing concrete wall, you said that has never proved --

17          A       I said that the method, which is some type of  
18 concrete anchors, has not proved to be adequate. As a matter  
19 of fact, several of the nuclear facilities now are forced  
20 to go back and reanalyze a lot of supports that were fastened  
21 by a concrete type anchor, which is why there'd be a red head  
22 or a wedge.

23                   Bechtel is doing extensive reanalysis on certain  
24 facilities because of the problems with these. They tend  
25 to pull out as time goes on.



1 Q Is the problem that you foresee here, is it one  
2 that, to your knowledge, has ever actually been analyzed?  
3 That is, has anyone attempted to investigate the feasibility  
4 in some detail of breaching an existing spent fuel pool for  
5 purposes of expanding it?

6 A No, I do not -- I do not know whether anybody has  
7 analyzed that or not.

8 Q Did you -- are you familiar with proposals that  
9 have been made by the Department of Energy of the possible  
10 use of the spent fuel storage pools now at Nuclear Fuel  
11 Services in West Valley for adjacent pools for the purposes  
12 of the storing of additional spent fuel? Are you at all  
13 familiar with that?

14 A No, I am not.

15 Q Okay. So you would have no knowledge of whether  
16 they might have looked into that?

17 A They may have. I do not know.

18 Q When you did your analysis of the cost of a spent  
19 fuel storage -- independent spent fuel storage facility here,  
20 and you reduced it down to a per-assembly cost, what you did,  
21 as I understand it, was you took the -- to try to get every-  
22 thing to what you considered to be an equal level, you took  
23 out a certain group of costs and got everything down in this  
24 sort of \$10,000 to \$15,000 range, is that correct?

25 A Yes, I took out a group of costs, and then I

divided by the number of . . .

Q Assemblies?

A -- assemblies per facility, to put it on an equal basis.

Q Did you look at Applicant's Exhibit Number 1 -- do you have that in front of you?

A Yes, I do.

Q All right. On page 2, under Arabic 1, little d. with half a paren, the example involving a 3000-spent fuel assembly facility --

A Yes, I did. I think I mentioned earlier in my testimony that I found problems with l.d.

Q Okay. Do you want to tell us about that?

A My problem was that l.d. referenced -- or l.c. -- d. mark is same as c., okay? It references a rack that's 15-1/2 inches on center. l.d., same as above except storage provided while the racks are 10-1/2 inches on center.

When I reviewed this, c. indicated to me that you had two racks every 31 inches, or 15-1/2 inches on center, while d. was putting racks at 10-1/2 inches on center, or you had three racks every 31-1/2 inches.

Now, what happened was the original facility, which was the 1500 facility, was 15-1/2 inches on center, and now they reference down here racks with 10-1/2 inches on center.

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1 Well, if you have two racks at 31 inches on  
2 center, and three racks at 31-1/2 inches on center, basically  
3 you've only increased the capacity of the racks by 50 percent.  
4 You've added one more rack in the same distance.

5 If you agree with that, I --

6 Q Well, I'm not going to agree with anything.

7 A Okay, I understand.

8 Q I want you to testify, and I'm going to listen.

9 A All right. Based on that, I saw that the facility,  
10 by changing the rack size, had increased 50 percent, which  
11 meant that you went from 1500 to 2250 assemblies.

12 Now, they show a differential cost of about  
13 \$6 million for the capital investment. I believe that the  
14 c. capital investment was about \$55 million, and d. about  
15 \$61 million.

16 It puzzled me how, for 10 percent, they can  
17 increase the additional capacity of the system by 50 percent.

18 Therefore, I felt that since I had considerable  
19 question with these numbers, I preferred not to use it.

20 Q Two questions:

21 One, did you contact Duke to attempt to get a  
22 better understanding of this?

23 A No, I did not.

24 Q You were aware that this document was in evidence  
25 under oath in this proceeding, were you not?

wal 8

A Yes, I was.

Q Is it possible that the reason that the numbers are different is that Duke was actually thinking that the 3000 facility might be physically larger than the 1500 facility?

MR. MC GARRY: Objection. The question is premised upon what Duke thought.

MR. ROISMAN: No, I asked what is possible, not premised on what Duke thought. Is it possible.

CHAIRMAN MILLER: Yes, you may answer it.

WITNESS PITTIGLIO: I assumed that that was the case. I just couldn't justify for an additional 10 percent how you could increase the facility by 50 percent in size. That's why I did not consider it.

BY MR. ROISMAN:

Q Well, let's see. Let me direct your attention to Staff Exhibit 27A, page 5, and I'll read your answer to a question: "Do you think Duke's cost estimates are reliable?"

You say, "Duke has the capability of being their own architect-engineer and constructor for this facility. Their charges for engineering, labor and overhead contingencies and interest are based upon past experience in the construction of their own nuclear facilities. Duke's estimates for contingency is 25 percent. This is not an unreasonable contingency for a new facility of this type."

1 Is the thrust of that answer that you consider  
2 Duke to be a fairly reliable organization, and that when they  
3 make estimates you think they're pretty reliable?

4 A Yes, I do.

5 Q Well, can you explain to me why you either don't  
6 have the same confidence in item d., or if you don't, why  
7 the existence of item d. doesn't shake your confidence in  
8 Duke's capabilities?

9 A I based this, again, on my own engineering  
10 judgment. I also -- there was one other point that concerned  
11 me slightly, was that the original facility, the 1500  
12 facility, was again a 1976 estimate, escalated at 8 percent  
13 a year, to get to the \$55 million.

14 At that time I don't think that, in my opinion,  
15 poison racks were a viable option. I did not know, and was  
16 not able to determine, whether, when increasing the capacity  
17 of the pool existing systems such as the cooling system had  
18 been modified in this cost, or whether they had just -- just  
19 the cost had been escalated and something added to it.

20 Q Well, isn't it true that if the item d. figures  
21 are reliable, that your estimate of the cost of an independent  
22 spent fuel storage facility per assembly would have been  
23 substantially lower than the figures given in Staff Exhibit  
24 27A?

25 A That is true. However, I was trying to evaluate

wal 10

1 things equally, and the Stone & Webster report, in the cover  
2 letter of September 6, mentions a high-density rack of the  
3 flux type, but not a poison rack.

4 Therefore, I would have been forced to evaluate  
5 the other report on that basis also, and I wasn't able to  
6 contact Stone & Webster to confirm whether their facility  
7 was adequate with poison racks or not, also.

8 Q You weren't able to contact Stone & Webster?

9 A I didn't. I felt that the easy alternative for  
10 me, since I had question with this engineering evaluation --  
11 and I'm not saying it's wrong -- was to base it on what I  
12 felt confident in.

13 Q So it may, in fact, be the case that if you had  
14 called Stone & Webster and got clarified on the poison racks  
15 situation, and called Duke and found out it had answers to  
16 the problems that you had with item d., that the real dollar  
17 cost estimate per assembly for an independent spent fuel  
18 storage facility, for the group of costs that you were  
19 attempting to look at in Staff Exhibit 27A, might have been  
20 substantially lower, is that correct?

21 MR. KETCHEN: Objection. That's been asked and  
22 answered, once at least.

23 CHAIRMAN MILLER: You may answer.

24 WITNESS PITTIGLIO: It may have been, yes.

25 Again, my other problem was that even the Duke

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1 application for rerecking of their pools, as Mr. Spitalny  
2 mentioned yesterday, only went as close as 13 inches.

3 I just lacked confidence in the 10-1/2 inch  
4 spacing, which I stated earlier, plus, even assuming the  
5 facility, again, was larger, I was unable to justify in my  
6 mind how a facility could increase in size by 50 percent at  
7 only a nominal 10 percent cost increase.

8 BY MR. ROISMAN:

9 Q Well, I'm going to ask you this question again,  
10 because I don't think you told me yet.

11 You've gone through what I must state seems to be  
12 a fairly impressive indictment of Duke's engineering --

13 MR. KETCHEN: Objection, Mr. Chairman. I think  
14 the attorney is testifying now to what his impressions are.

15 CHAIRMAN MILLER: He hasn't even finished the  
16 question.

17 BY MR. ROISMAN:

18 Q -- of what Duke's engineering and cost estimating  
19 capabilities are with respect to this item d. in Applicant's  
20 Exhibit Number 1.

21 I still want to know why that doesn't make you  
22 substantially less confident of the accuracy of Duke's other  
23 cost estimates upon which you rely in Staff Exhibit Number 272?

24 MR. KETCHEN: Objection, Mr. Chairman.

25 This witness has answered the question, I think.

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1 why he --

2 CHAIRMAN MILLER: What do you think his answer  
3 was?

4 MR. KETCHEN: His answer was he didn't use item  
5 l.d. in his evaluation, and he explained why several times.

6 CHAIRMAN MILLER: The question is that the reason  
7 he didn't use it might or might not have a bearing upon his  
8 ultimate evaluation.

9 That's what he's been asked before, and I don't  
10 recall a square answer.

11 You may answer.

12 WITNESS PITTIGLIO: Would you repeat the question  
13 again?

14 BY MR. ROISMAN:

15 Q Okay. I'm not trying to improve on the way the  
16 Chairman has put it.

17 You found a lot of things potentially wrong with  
18 the way Duke made the estimate in item d. of Applicant's  
19 Exhibit Number 1 with regard to the cost of the 3000 space  
20 storage -- independent spent fuel storage facility.

21 CHAIRMAN MILLER: Is that correct?

22 WITNESS PITTIGLIO: Yes, that is correct.

23 BY MR. ROISMAN:

24 Q And what I'm asking you is: Given that they may  
25 have made some substantial mistakes in doing that, why do you

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1 continue to have confidence in the accuracy and competence of  
2 figures that you rely upon from them in Staff Exhibit Number  
3 27A7

4 A I have to agree with them, that in any facility  
5 I realize that poison racks will increase the capacity of the  
6 system about 50 to 60 percent.

7 However, I was mainly concerned with the capital  
8 cost of the investment, rather than evaluating the -- the  
9 question was . . . let me just back up.

10 I agree that poison racks will increase the  
11 capacity of the system. Therefore, I really have no major  
12 problem as a whole with the lower cost.

13 However, there were certain engineering complications  
14 involved to me, and therefore I did not use the number.

end WEL 1 15

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CHAIRMAN MILLER: You still haven't answered it.

Rephrase it so that the witness perceives what at least I understand to be the thrust of the question. I don't think that he fully understands.

MR. ROISMAN: I think the best thing to do is perhaps if I explain what it is, and then I'll ask the question. I'm not trying to testify, I'm simply trying to....

BY MR. ROISMAN:

Q What it appears you have done is you have identified what on the surface appear to be some fairly substantial inconsistencies that appear in the cost estimates that make up Item D that aren't immediately explainable: a failure to use the right number for the distance between the centers in using the poison racks; failure to adequately escalate the costs for the installation of that many more racks in one pool; failure to calculate properly how much the capacity of a pool will be increased if you put poison racks into it.

Those all sound like things, to me as a layman, that a good estimator engineer ought to have seen and spotted, and those questions were enough for you to say you didn't want to rely upon Item D.

Given that it's the same person who did the cost estimating and the same person that did the analysis for Item C upon which you do rely, what's the basis for your

WEL/A32 1 confidence that that person did such a good job in Item C  
2 when you've got all these questions about them in Item D?

3 A (Witness Pittiglio) I understand the question  
4 now.

5 The reason why I have confidence in Item C as  
6 compared to Item D was I evaluated Item C with similar situa-  
7 tions or questions in my own mind before I accepted that  
8 number. And based on my own response, I found C to be ade-  
9 quate. And I had questions with D.

10 Q Well, --

11 MR. KETCHEN: Mr. Chairman, may I interrupt?  
12 There's a problem here. I would like to take a break now and  
13 I would like to consult with this witness because I think  
14 there's a lot of testimony given in here and I'd be willing  
15 to clarify it with Counsel participating, but I think we're  
16 just wasting a lot of time maybe on the record, due to an  
17 assumption that may or may not be erroneous. And I'd like  
18 the opportunity to find out.

19 CHAIRMAN MILLER: Well, we're going to take our  
20 morning recess at this time. As to whether or not you should  
21 confer with the witness who is under cross-examination, I  
22 think that's a matter that you and Counsel should discuss.  
23 Normally --

24 MR. ROISMAN: I will oppose that, but I have no  
25 objection to him, on the record, at this point interposing

WEL/et 3

some redirect examination so that we don't waste any time.

I don't have any problem with that.

CHAIRMAN MILLER: Would that be acceptable, Mr. Ketchen?

MR. KETCHEN: Maybe it will save us a lot of time.

MR. ROISMAN: Okay. That's fine. I will temporarily stop cross-examination to allow some redirect.

CHAIRMAN MILLER: All right, we'll suspend cross in order to permit further clarification that might be helpful, Mr. Ketchen.

MR. MC GARRY: Mr. Chairman, in the effort to speed things along, would it be appropriate to take a break now, and then we could --

MR. ROISMAN: Just as long as there's a prohibition on the witness or any witness of the Staff or the Applicant talking to this witness.

CHAIRMAN MILLER: We don't mind. We think that the request is probably reasonable under the circumstances. It usually follows that a witness under cross-examination may be requested not to confer with anyone until that particular aspect has been concluded if we're going to have a recess.

WITNESS NASH: You don't wish me to speak with him?

CHAIRMAN MILLER: At the moment, no. We've been requested-- You see, that's the problem when we have panels.

WHL/ert 1 Therefore, in order to preserve the integrity of the witness  
2 process, and there's a request made and an apparent reason  
3 for it, we request the witness who is under cross-examination  
4 not to confer with anyone at that point until the subject  
5 is covered.

6 It's the usual customary manner. It doesn't cast  
7 any reflections on anybody.

8 All right, would you like to have a recess under  
9 those conditions?

10 MR. KETCHEN: Yes.

11 CHAIRMAN MILLER: All right.

12 (Recess.)

13 CHAIRMAN MILLER: Proceed.

14 MR. KETCHEN: Mr. Chairman, as part of this re-  
15 direct I'm going to ask Mr. Spitalny to give Mr. Pittiglio  
16 a calculator.

17 CHAIRMAN MILLER: Yes. All right, you may proceed.

18 REDIRECT EXAMINATION

19 BY MR. KETCHEN:

20 Q Mr. Pittiglio, I'm going to ask you a few pre-  
21 liminary questions with respect to your considerations of  
22 how you considered Item 1-D in that exhibit. This may sound  
23 simplistic, but I would like you to deal with the following  
24 calculation.

25 I would like you to take the number 10 and multiply

WEL/eb5 1 it by 10 and tell me what you get.

2 A (Witness Pittiglio) I'm having a little trouble  
3 with this calculator.

4 (Laughter.)

5 CHAIRMAN MILLER: Why don't you start with some-  
6 thing a little easier?

7 (Laughter.)

8 WITNESS PITTIGLIO: In fact, I only got 10.

9 MR. ROISMAN: Just a second.

10 Mr. Chairman, I'm going to give the witness a  
11 calculator that even I can use. You just do one zero plus  
12 the x and one zero and press the equals.

13 WITNESS PITTIGLIO: All right. I got 100.

14 MR. KETCHEN: I'm not trying to be facetious,  
15 Mr. Chairman, but I think it gets us to a point.

16 BY MR. KETCHEN:

17 Q Then 15 times 15, and what the produce of that is.

18 A You don't want me to say the last number now, do  
19 you? This calculator has no memory on it.

20 Q Well, you can just tell me what it comes out to.

21 A No, I mean-- 15 times what?

22 Q 15.

23 A 225.

24 Q All right.

25 Can you tell me the percent increase between the

WRL/ehs 1 factor 10 and the factor of 15?

2 A 50 percent.

3 Q Okay.

4 And then on the product that you got from 10 by  
5 10 and the produce you got from 15 by 15, I recall one was  
6 100, one was 225, what is the percent increase of the latter,  
7 the lower to the higher?

8 A 225 percent.

9 Q All right.

10 Now I would like you to take-- Do you want to  
11 give me that answer again?

12 A 225 percent.

13 Q I'm looking for the percent increase of 225 over  
14 100.

15 A 225 divided by 100? I think what you're getting  
16 at is that the area of one assembly is about 225 square  
17 inches. Is that correct?

18 Q No. What I'm trying to get at is that --

19 MR. ROISMAN: Wait.

20 Mr. Chairman, I think under the circumstances --

21 CHAIRMAN MILLER: Yes.

22 Since we're running a test, you see, then we must  
23 run a test.

24 WITNESS PITTIGLIO: 225 divided by 100 equals  
25 2.25.

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BY MR. KETCHEN:

2 Q Okay, but that's not the question.

3 The question is what is the percent you get when  
4 you subtract 100 from 225 and divide it by 100?

5 A (Witness Pittiglio) 125 percent.

6 Q All right, sir.

7 Now I'd like to get it more specific into the case  
8 now if you would. I would like you to take the rack area  
9 of 15-1/2 by 15-1/2 cans. Okay? Just the framework.10 Then I would like you to take 15-1/2 multiplied  
11 by 15-1/2 by 1500 spaces and give me the product in square  
12 inches.

13 A It appears to be 360,375 square inches.

14 Q That's correct. Okay.

15 Would you write that down?

16 A Would it be easier to put it into square feet?

17 Q No, square inches is fine.

18 A All right.

19 Q Okay.

20 Now if I may lead, my understanding is that's the  
21 area that would be required to store in 1500 spaces on  
22 15-1/2 by 15-1/2 centers.

23 A That's correct.

24 Q All right.

25 Now you've written that number down?



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1 A Yes, I have.

2 Q Now I would like you to take 10-1/2 inches multi-  
3 plied by 10-1/2 inches, and give me a number.

4 A 110.25.

5 Q And that's the area of one fuel assembly --

6 MR. ROISMAN: Objection.

7 CHAIRMAN MILLER: Well, let him state it.

8 MR. ROISMAN: Well, what he's going to do is he's  
9 going to tell the witness what it is instead of asking the  
10 witness what it is.

11 CHAIRMAN MILLER: Yes, it would be better --

12 BY MR. KETCHEN:

13 Q With respect to fuel assemblies, what is that?

14 A (Witness Pittiglio) That's the area of a 10-1/2  
15 inch center-to-center spacing fuel assembly.

16 Q All right.

17 Would you write that number down?

18 A (Witness complying.)

19 Q Have you got that number?

20 A Yes.

21 Q Now I would like you to take the number that I  
22 asked you to write down before of 360,375 square inches and  
23 divide that number by the number you just calculated by  
24 multiplying 10-1/2 by 10-1/2, and would you give me that  
25 product?

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1 A Product or --

2 Q I'm sorry, the result.

3 A I come up with 3268.

4 Q Okay.

5 Now what does that number represent with respect  
6 to fuel assemblies?7 A That's the number of assemblies with 10-1/2 inches  
8 on center.9 Q Now I would like you to take that number, 3268--  
10 Let me strike that.11 Just for the sake of communication, is 3268 -- is  
12 that sometimes referred to as cans? Do you know the term  
13 "cans"?

14 A I don't use the term. I'm not familiar with it.

15 Q Okay.

16 Can we use the term "spaces"?

17 A All right. "Spaces" is more familiar.

18 Q 3268 spaces.

19 Now what does the 3268 spaces represent with res-  
20 pect to --21 A That represents the number of spaces at 10-1/2  
22 inches on center.

23 Q Okay.

24 Mr. Pittiglio, based on the calculations that  
25 you've done -- and if you'd like some time to consider this,

WEL/eb10 1

2 I'm sure the Board will give you the time -- with respect  
3 to the 360,375 square inches in space, I would like you to  
4 explain the difference with respect to the spaces that are  
5 available in that area between 15-1/2 by 15-1/2 spent fuel  
6 assemblies, center-to-center spent fuel assemblies, and  
7 10-1/2 by 10-1/2 center-to-center spent fuel assemblies with  
8 respect to the differential in the amount of spaces avail-  
9 able.

10 A It appears that the pool at 10-1/2 inches on  
11 center is capable of holding over 3,000 assemblies based on  
12 that calculation.

13 My mistake was that I used the center-to-center  
14 spacing and neglected the over-all area when I compared them.  
15 It was one of the reasons why I did not use that number. I  
16 was incorrect on that mathematical calculation.

17 MR. KETCHEN: Now, Mr. Chairman, if I may just  
18 explain to the Board, I guess the problem with the record  
19 right now is that there's a lot of-- The I-D that Mr. Roisman  
20 is questioning on, this witness answered that he rejected in  
21 his analysis.

22 Now whether he was in error in rejecting it,  
23 whether he made a mistake or did it in the correct way, the  
24 point I'm trying to make with the testimony is it was re-  
25 jected even though he may have done so in an improper way.

So my point was to bring out to the Board and

WEA/ebll 1

2 Mr. Roisman as well that the testimony may have just been  
3 going in a very obtuse, peripheral way, and I wanted to  
4 clear that up before we continued.

5 CHAIRMAN MILLER: Mr. Roisman, you may resume.

6 CROSS-EXAMINATION (Resumed)

7 BY MR. ROISMAN:

8 Q Mr. Pittiglio, based on the redirect examination  
9 that has just taken place, do you now feel that example D  
10 is a reliable analysis of the potential cost of building a  
11 3,000 spent fuel assembly facility independently at the  
12 Oconee site?

13 A (Witness Pittiglio) Yes, I do.

14 MR. ROISMAN: I have no further questions,  
15 Mr. Chairman.

16 CHAIRMAN MILLER: All right.

17 Does anyone else have questions of the panel?

18 Mr. McGarry-- Oh, I'm sorry. I don't care who  
19 comes next, Mr. Riley or Mr. McGarry. Do you have a prefer-  
20 ence, gentlemen?

21 MR. ROISMAN: I think Mr. McGarry since he's more  
22 like direct than cross.

23 CHAIRMAN MILLER: Well, I don't --

24 MR. MC GARRY: I just want to note for the record  
25 I object to that characterization, I'm more like direct than  
cross. If I have questions it's cross-examination. We've

WEL/ob12 1 gone through this before two weeks ago, whether even I had  
2 a right to cross-examine.

3 I'm not going to throw up the soft balls, as  
4 Mr. Roisman says, and give these witnesses an opportunity.  
5 If I have questions --

6 CHAIRMAN MILLER: Pardon me just a minute,  
7 Mr. McGarry.

8 The reason that the Board is interested is for a  
9 wholly different reason, namely, the leading or non-leading  
10 nature of questions we would expect you to follow. That's  
11 our only point.

12 MR. MC GARRY: I see, Mr. Chairman.

13 CHAIRMAN MILLER: We meant nothing else. However,  
14 your questions would be more nearly like direct in the sense  
15 we would not expect you to lead as much as someone whose  
16 questions are more in the nature of cross would be permitted  
17 to lead. That's a point we mentioned before.

18 And in that regard we'll give you the option if  
19 you wish to proceed now, Mr. McGarry, or if Mr. Riley wishes  
20 to cross-examine. The Board doesn't really care either  
21 way, whichever is more convenient for you, gentlemen.

22 MR. MC GARRY: It makes no difference to me. I'll  
23 just say at this point in time I don't have any questions.

24 CHAIRMAN MILLER: Well, maybe you will have once  
25 Mr. Riley --

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1 MR. MC GARRY: That's why I think it may be more  
2 appropriate if Mr. Riley goes now.

3 CHAIRMAN MILLER: Very well.

4 Mr. Riley, you may proceed.

5 BY MR. RILEY:

6 Q Mr. Pittiglio, on Exhibit 27-A, on the unnumbered  
7 page you have a line heading which is "Engineering labor  
8 and overhead." Should there be a comma after the word  
9 "Engineering"?

10 A (Witness Pittiglio) That was taken directly from  
11 our other reference.

12 Q Well, in order to give the correct sense of it,  
13 are you tell us that that's engineering labor, or is that  
14 engineering, comma, labor, a different sort of activity?

15 You'll see in the line immediately below in the  
16 following paragraph it reads: "Engineering, labor and  
17 overhead."

18 A Yes. I think that there should be a comma in  
19 there. The sentence below is correct.

20 Q Then would it be proper to correct that page by  
21 inserting a comma after "engineering" in the line entry?

22 A You can insert the comma.

23 Q Now does your testimony read, with or without  
24 the comma?

25 A The testimony doesn't have a comma in it.

WBL/eb:4

Q I'm saying do you wish to correct it?

A Yes.

Q Mr. Pittiglio, you worked with Bechtel and acquired considerable knowledge about their mode of operation. Have they built turnkey type facilities for nuclear generating stations?

A Yes, they do build turnkey type facilities.

Q Now when Bechtel does a turnkey contract, does it take the responsibility for being sure that the facility meets NRC regulations?

A Bechtel does do that.

I may also mention that Bechtel never takes a flat bid contract but always a cost-plus contract in their turnkey operation.

Q Under these circumstances is the Applicant required to provide backup engineering?

A I think the Applicant would for its own protection provide engineering assistance to Stone and Webster, if they were the contractor, or whoever the contractor was.

Q My question was: Does the Applicant -- and I'll add the word "invariably," provide backup engineering?

A All jobs that I've previously worked on, yes.

Q In the third line from the bottom of the same page there is reference to the Stone and Webster proposal for a facility capable of storing 2300 PWRs. What type of

Hel 1

1 rack is envisaged for storing that number of PWR assemblies?

2 A The cover letter indicates, that September 6 cover  
3 letter, I believe, indicates a high-density rack of the flux  
4 type for this facility.

5 Poison racks could also be provided, but they have  
6 not been included.

7 Q If poison racks were provided, roughly how much  
8 would that increase the capacity of the installation?

9 A I believe that the common belief is around 50  
10 to 60 percent.

11 Q Did you not just demonstrate for the 10-1/2 versus  
12 15-1/2 inch centers, that it was nearer a factor of 2, 118  
13 percent?

14 A In this particular case, yes, provided that 10-1/2  
15 inches is an acceptable spacing.

16 Q Do you know whether the -- can you tell us what  
17 the spacing was for the 23007

18 A No, I cannot.

19 Q Turning to page 3 of the same exhibit --

20 A Page 3?

21 Q Yes. You were asked the question, would it be  
22 advantageous for Duke Power to physically expand the Oconee-3  
23 pool as suggested by the Carolina Environmental Study Group,  
24 which involves building an addition to an existing pool, pool  
25 number 3? Did you have any problems -- well, you've already



testified that you've seen the physical layout of pool number 3.

A That is correct.

Q And would it be a correct characterization to say that that direction of fuel movement from reactor number 3 to and into fuel pool number 3 is in line with, say, the axis of the three reactors on the site, parallel to that line?

I can show you a drawing, if it'll help.

A Would you?

CHAIRMAN MILLER: While Mr. Riley is getting the drawing, Mr. McGarry, I want to say, in fairness to you, that perhaps I didn't state accurately the Board's view of your position as an examiner.

We've been taking the position that where the interests of the Applicant, as you perceive them, are very similar to that of the Staff, that you would examine, but without sharply leading questions, and that kind of thing.

This is not to suggest, however, that at any point you would not be entitled to either dissociate yourself from the views of the Staff witness, or anyone else, and ask leave to cross-examine in the full sense.

Did you understand that was what we meant?

MR. MC GARRY: Yes, Mr. Chairman.

CHAIRMAN MILLER: All right.

MR. RILEY: Mr. Chairman, should this be

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1 introduced as an exhibit?

2 CHAIRMAN MILLER: Did you say has it, or may it?

3 MR. RILEY: Should it?

4 CHAIRMAN MILLER: It should be marked for identifi-  
5 cation.

6 MR. RILEY: I would like to mark for identification  
7 this exhibit, and it is a line drawing of a plan of the  
8 Oconee plant, and the title is, "Duke Power Company Oconee  
9 Nuclear Station, Units 1 and 2."

10 CHAIRMAN MILLER: All right, we'll have it marked  
11 for identification. What's your designation?

12 MR. RILEY: I'm not sure where we are.

13 CHAIRMAN MILLER: CESC Number blank for identifica-  
14 tion, and then we'll fill it in.

15 MR. MC GARRY: 7, Mr. Chairman.

16 CHAIRMAN MILLER: All right. CESC Exhibit 7.

17 (The document referred to was  
18 marked for identification as  
19 CESC Exhibit 7.)

20 BY MR. RILEY:

21 Q I would like to identify to you, Mr. Pittiglio,  
22 reactors 1, 2 and 3 on this exhibit, joint fuel pool 1 and 2,  
23 and separate fuel pool number 3.

24 Could you now answer the question I put to you,  
25 whether the direction and the movement of the spent fuel casks

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1 for reactor 3 fuel pool 3 is on the line parallel to a line  
 2 connecting the centers of the three reactors?

3 A (Witness Pittiglio) Yes, it is.

4 Q Now, in your consideration of CBSC's proposal,  
 5 would it be necessary, in your judgment, to make a right-angle  
 6 turn with respect to the axis just described for moving spent  
 7 fuel into a hypothetical pool addition?

8 A From this drawing, it appears that way.

9 Q All right.

10 AS an engineer do you have any problems with  
 11 making the right-angle turn, assuming that the pool addition  
 12 could be made without breaching problems, that the engineering  
 13 could be satisfactorily done?

14 A You mean, now, building the pool perpendicular to  
 15 the existing pool?

16 Q Building an extension perpendicular. Assuming the  
 17 problems involved there could be satisfactorily handled, do  
 18 you see a problem with changing the direction of motion of  
 19 the assemblies 90 degrees, so that it could enter or leave the  
 20 pool addition?

21 A I don't see any problem. I would imagine you're  
 22 going to have to rotate the assembly, which is going to use  
 23 space in the existing pool.

24 I see no problem with doing that.

25 CHAIRMAN MILLER: Mr. Riley, did you mark your

Exhibit for identification, CESG Number 7? Please mark it  
on the document itself, so it will reflect it.

BY MR. RILEY:

Q You note at the bottom of the same page of your  
testimony, Mr. Pittiglio, that quote:

"A major drawback from this type of expansion  
would be the limited size of the pool, 650 assemblies  
as testified to by S. Hager of Duke Power on Friday,  
June 22nd, 1979."

Is that correct?

A (Witness Pittiglio) Yes.

Q What type of racking was involved for the 650  
assemblies?

A I do not know. I was not at the hearing on  
Friday the 29th. This was taken out of the testimony that  
I read.

Q So your basis for the 650 limitation is -- well,  
strike that.

Did you conduct any further investigation of the  
matter which would have ascertained the area of the proposed  
pool addition?

A No, I did not.

Q It's your testimony that you do not know the  
rack size?

A No, I do not know which racks were used in that

WJL C

1 analysis.

2 Q Given the fact that you do not have information  
3 on the area or the rack type, are you reliably able to state  
4 that the limitation of such an addition would be 650  
5 assemblies?

6 A Based on that testimony.

7 Q I'm asking you, Mr. Pittiglio, based on your own  
8 verified information are you able to state that that is a  
9 limitation?

10 A Let me say that I based that assembly size at that  
11 time on the testimony of that date.

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12 CHAIRMAN MILLER: I think that's a fair answer.  
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BY MR. RILEY:

Q In the same paragraph, Mr. Pittiglio, you have stated that the existing support systems needed to operate the Oconee 3 pool have not been sized large enough to accommodate the increased capacity of spent fuel.

The particular inventory of the pool, in terms of the number of assemblies, how much age they have on them and the integrated thermal output, would determine the heat exchange requirements of that pool?

A (Witness Pittiglio) Yes, that's true.

Q And if there is a sufficient amount in this pool system of fuel with considerable age on it, the additional thermal requirements would be comparatively small, is that correct?

A That would be true.

Q Going to the paragraph above that, you say:

"The Oconee 3 pool was not originally constructed with the capability for later expansion. The pool does not have an expansion gate or canal which can be used for the transfer of assemblies to a new pool."

What was the basis for your testimony that the pool does not have such an expansion gate or canal?

A I reviewed the drawings with Mr. Spitalny, who had the drawings, I did not have the drawings, and it

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revealed that situation.

Q All right.

Given then that situation, one could pose an engineering problem of how could one do this particular operation. In other words, could one provide that you've already testified to what you see as problems in doing that, namely, problems in the excavation, differential settlement of the existing pool and the pool addition, problems I'm sure with joining the liners -- you specifically raised the question about anchoring, I believe it was, the liner. Is that correct?

A Yes, assuming that you're using an existing wall.

Q Right.

You explained that anchors had been found to work loose in other applications in the industry, is that correct?

A Yes, that is correct.

Q Why do you feel that anchors would have to be used in this particular application?

A I think we agreed that you have to put a liner plate on the pool.

Q No question.

A Somehow the liner plate has to be fastened to the pool wall.

Q Correct.

A There are no embedded plates in the exterior wall

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of the pool at this time, that's my understanding.

Q Correct.

Now on the outside wall of the existing pool at the point where the proposed attachment could be made, could there not be poured an additional segment of wall, double walling, so to speak, in which these plates could be embedded?

A You can pour an existing wall, true, and embed plates. However, you have to anchor the wall then back to the existing wall.

Q Is it not a well-established construction practice where you have two structures, one of which is an addition to another, to have a flexible connection?

A Yes, that is the case when the structures are not interconnected -- I mean, the pool is full of water now.

Q Are you familiar with the use of corrugated stainless steel diaphragms as a means of providing a flexible connection between elements of a structure?

A I'm not overly familiar with it, no. I have heard of it and seen -- I do know that sometimes the practice has been used.

Q You know they exist?

A Yes.

I might comment that the use of the flexible-type connection between the two buildings is usually done to



1 eliminate transferring seismic loads between structures.

2 Q That is right, but you raised -- this will be  
3 argumentative, I'm sorry.

4 CHAIRMAN MILLER: We'll give you a chance at the  
5 appropriate time.

6 BY MR. RILEY:

7 Q I would like to turn to you now, Dr. Nash.  
8 Can you tell us for the last three years what  
9 the annual rate of inflation has been?

10 A (Witness Nash) As an average for those three  
11 years?

12 Q No, for each year.

13 A I don't have that in front of me.

14 Q Would it be burdensome to obtain it?

15 A I couldn't get it this morning. It would not be  
16 burdensome if I were at my office.

17 Q Could you come up with a figure which then you felt  
18 did represent the average for the three years?

19 A At my office, are you asking?

20 Are you asking if I had access to --

21 Q No, I'm saying right now. You asked me before  
22 do I want an average or year-by-year, and I said I wanted it  
23 year-by-year. You said I don't have it here. Now I'm asking  
24 you can you tell us what the average for the three-year period  
25 is?

1 A Six to seven percent would be about right.

2 Q Six to seven percent.

3 And you have stated that there is usually a  
4 differential between interest and cost of living increase  
5 or inflation of three percent.

6 A This is the difference between the cost, the  
7 weighted cost of money to utilities and the general inflation  
8 rate, that's the three percentage points that we determined.

9 Q Right.

10 I have here Duke's 1978 Annual Report.

11 MR. RILEY: If I may ask Mr. McGarry, I think  
12 it's already in evidence as a Duke exhibit, is that correct,  
13 or Mr. Porter, can you help us?

14 MR. PORTER: I don't believe it is.

15 CHAIRMAN MILLER: Hold a minute, let's try to  
16 find out.

17 (Pause.)

18 MR. PORTER: Mr. Riley, my list of exhibits does  
19 not show it as an exhibit.

20 CHAIRMAN MILLER: Would it be in the application  
21 that was filed by Duke?

22 MR. PORTER: No, sir.

23 MR. RILEY: Then I would like it to be introduced  
24 as an exhibit to be marked as CESG Number 8.

25 CHAIRMAN MILLER: All right. It will be marked

**POOR ORIGINAL**

1 for identification.

2 (Whereupon, the document  
3 previously referred to as  
4 CESC Exhibit Number 8 was  
5 marked for identification.)

6 BY MR. RILEY:

7 Q I show you in this 1978 Annual Report  
8 page 24. There's a heading on page 24 which is marked  
9 "Long-term Debt."

10 Is it your understanding that mortgage and  
11 refunding bonds have a period of 30 years, Mr. Nash?

12 A (Witness Nash) I'm not intimately familiar  
13 with the different -- with the details of financing arrange-  
14 ments.

15 Q I understand, Mr. Nash, that you are a financial  
16 specialist. Can you explain why you're not familiar with  
17 the provision of the most basic, largest amount of funds in  
18 constructing a nuclear facility?

19 A Well I've never claimed expertise as a financial  
20 specialist in the sense of knowing the arrangements of the ---  
21 the terms and conditions of various bonds and equity financing.  
22 Economists generally rely on financial experts for the  
23 details of these financing arrangements.

24 Q But aren't those the interest rates that you're  
25 referring to in your testimony?

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A These are the interest rates, these are a component of the interest rates. The source of information that we used to derive this conclusion was from Moody's Public Utility Index where they identify basically three types of sources of financing, that is, bonds, preferred stocks and common stocks.

Q But aren't we discussing a specific case, namely, Duke's application and Duke's financial arrangements?

A Yes, we are.

Q Would it not be appropriate then to examine Duke's history with respect to what it has had to pay for money in the most recent period?

A I wouldn't expect them to be vastly different from the general experience in the industry.

Q I will show you this exhibit, page 24, "Long-term Debt," and would you please read the last three entries in two columns, one column is Year Due and the other is Series, which describes the interest. If you would read Year Due first.

A "Year Due 2006; Series 8-3/4 percent.

"Year Due 2007; Series 8-1/8 percent.

"Year Due 2008; Series 9-3/8 percent."

Should I read the heading of the table?

Q You certainly may.

CHAIRMAN MILLER: Yes. Make it complete.

WITNESS NASH: The table is entitled "Long-term

1 Debt," and the heading is "First and Refunding Mortgage Bonds  
2 Outstanding at December 31st, 1978 and 1977 Were as Follows  
3 (Dollars in Thousands)."

4 CHAIRMAN MILLER: Are there any other explanatory  
5 notes or information with regard to that data? If so, you  
6 may read it.

7 WITNESS NASH: Well, having seen this for the  
8 first time, I'm not sure of the significance of everything I'm  
9 reading. But one note says:

10 "Substantially all-electric plant was  
11 mortgaged at December 31, 1978."

12 And then there's another note that I believe  
13 goes with the table. I'll just read the first part of it. I  
14 doubt the figures are significant. It says:

15 "The annual amount of long-term debt  
16 maturities (including sinking fund requirements  
17 and capitalized lease principal payments) through  
18 1983 are..." and then it lists figures in the several  
19 million dollars for various years. I doubt that that has any  
20 significance to the table.

21 If I might continue, I note that there are other  
22 years in these two columns that Mr. Riley referred me to that  
23 have different percentages.

24 MR. RILEY: I would like to stop the testimony at  
25 this point because we want current information.

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1 CHAIRMAN MILLER: We don't want argument, Mr. Riller.  
2 If you're asking him to look at something which we don't have  
3 in the record, we want it to be fair to all. We think the  
4 entire table should be read. If there are other years, we'd  
5 like to have them read right now.

6 DR. LUEBKE: If I may interrupt. One element of  
7 interest is usually the date of issue of the bond, is that  
8 given in the table?

9 WITNESS NASH: Let's see, there is a column  
10 saying Year Due.

11 CHAIRMAN MILLER: Nothing on year of issue?

12 WITNESS NASH: I don't see that.

13 CHAIRMAN MILLER: Well go ahead and read whatever  
14 you haven't read from the table, so we have a complete record.

15 WITNESS NASH: There are, perhaps, something like  
16 15 sets of figures that would be from these two columns.

17 CHAIRMAN MILLER: Well do you consider any of them  
18 to be pertinent to the matter being examined? We're relying  
19 on your judgment. We want to give you a chance to fully and  
20 fairly have the record reflect what you're looking at.

21 WITNESS NASH: Thank you.

22 I just might indicate that I think I could summarize  
23 the table in this way, that the year due, there are some due  
24 in 1979. These continue through the year 2008. And the  
25 series, which I take to be the rate of interest on these

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mortgages, start at 2-7/8ths percent in 1979. They generally --

BY MR. RILEY:

Q Excuse me, you say start in 1979?

A (Witness Nash) In 1979 bonds.

Q Bonds due in 1979.

A Bonds due have a rate of 2.78 percent. As you go forward in time, these rates increase rather linearly through -- rather, there is some variation, the high point being an 11 percent which is due in 1994, and then it goes to the three figures that were read into the record.

So there has been a generally rather substantial upward adjustment in rates as you go forward in time.

CHAIRMAN MILLER: Well do you know what determined those securities or do you know when the indebtednesses were originally made, can you tell that from the table?

WITNESS NASH: I cannot, unless these -- Okay, these two columns, apparently there are two columns listed 1978 and 1979 and the give dollar amounts. Now, I'm interpreting the table to mean that --

CHAIRMAN MILLER: That's the year they're due, isn't it?

WITNESS NASH: This is just the amount that's outstanding as of 1977 and '78. There's nothing in this table that indicates the year of issue.

MR. RILEY: Mr. Chairman, would it facilitate the

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proceeding to see if the Applicant would stipulate to the years of issue of these bonds? It would save us a lot of time.

CHAIRMAN MILLER: I don't know whether the Applicant has the information or can stipulate it. You can request it.

By the way, mark physically the exhibit number on there, please, as well as the page.

Are you willing to stipulate that information?

MR. MC GARRY: Are they set forth in that document, Mr. Chairman?

CHAIRMAN MILLER: I don't think so.

Show it to Mr. McGarry. It's an Annual Report.

DR. LUEBKE: If I may add, I think where we're at is that the cost of money is really related to the year of the bond issue.

(Document handed to Mr. McGarry.)

MR. RILEY: Mr. Chairman, Mr. McGarry does not have a financial person here. He says he will consult at the break and then stipulate.

CHAIRMAN MILLER: That's fair enough.

BY MR. RILEY:

Q Proceeding then on the assumption that the last three series that you read with respect to interest required were 8-3/8ths, 8-1/8th and 9-3/8ths percent, how does that



1 compare to a differential of 3 percent such as you referred  
2 to in your testimony vis-a-vis the cost of living increase?

3 A (Witness Nash) I believe that that would be  
4 fairly consistent with what we have derived as an industry  
5 average.

6 Q The question was how does it compare to the  
7 3 percent differential you discussed and the rate to which  
8 you testified of inflation, is it larger, is it smaller?

9 A It's essentially the same. But the figure that  
10 I read there is not the weighted cost of money that I used  
11 in my testimony.

12 Q You talked about interest rate. When you're  
13 paying dividends and making earnings for a company, do you  
14 call that interest rate?

15 A When you're paying dividends, no, that's a return  
16 on equity.

17 Q All right.  
18 Now was the language in your testimony then  
19 interest or cost of money?

20 A Weighted cost of money, which includes equity and  
21 debt financing.

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Q The testimony at this point shows that the capacity of the Catawba fuel pool is, as a ratio, greatly in excess of that of the Oconee or McGuire fuel pools. Is that correct?

A At least my understanding is that the physical dimensions are in excess.

Q We've heard discussions of the improved utilization of the existing pool by using poison racking. Is that correct?

A Yes.

Q Are you in a position to accept the number of assemblies produced at Catawba as 110 per year? And if you need to confer with other members of Staff, that's perfectly fine.

A I presume Mr. Spitalny has the figure in his mind, or very close at hand.

MR. KETCHEN: Mr. Chairman, I object to the procedure. I think the witness can be asked if he knows. If he doesn't know, I think that ends it.

CHAIRMAN MILLER: That's correct.

Objection sustained.

BY MR. RILEY:

Q Did you hear testimony to the effect that with a 40-year licensing period, subtracting more or less eight years to construct the plant, that the basis that we're

WRB/ab2 1 going on now is a plant life of 32 years or thereabouts?

2 A (Witness Nash) Yes.

3 Q All right. Let's have a hypothetical then:

4 If Catawba generates 110 spent fuel assemblies a  
5 year, and we multiply that by 32, we end up with 3,520.

6 A Okay, I'll accept the hypothetical.

7 Q All right.

8 Now the present position of the Catawba pool which  
9 has not yet been racked, according to testimony, is 2,836.

10 A The present --

11 Q Yes, with high density racks.

12 A The present capacity with high density racks --

13 Q Right.

14 A -- is 2,800?

15 Q -- 36.

16 As we've seen, the poison racks will approximately  
17 double this. And let's hypothesize the figure of around  
18 5600 racks.

19 A Okay. I'm accepting the hypothesis. I think the  
20 figure was something like 60 percent increase but....

21 Q We've had, several times, testimony. Mr. Pittiglio  
22 just came up with 125 percent increase, which is quite  
23 different from 60.

24 A 5600 you're asking me to hypothesize?

25 Q That's right.

WPS/eh  
1 And let's compare that to 3,570 that we postulate  
2 would be required through the lifetime of the Catawba plant.

3 Does this not represent a poor investment than  
4 on Duke's part in the sense that it is now buying capacity  
5 for Catawba that it will not use up in 32 years of Catawba  
6 operation?

7 MR. KETCHEN: Objection.

8 MR. MC GARRY: I'll object. The nature of my  
9 objection is whatever Duke's decision with respect to Catawba  
10 and the use of the capacity at Catawba is irrelevant to this  
11 proceeding.

12 CHAIRMAN MILLER: That objection will be over-  
13 ruled.

14 MR. KETCHEN: May I be heard on my objection,  
15 Mr. Chairman?

16 I think the question asked, the hypothetical, is  
17 inappropriate basically because there has been no establish-  
18 ment of the foundation of the relationship of the dimensions  
19 and what kind of fuel assemblies, and that type of thing,  
20 the difference between the two plants.

21 MR. MC GARRY: Mr. Chairman, I would just like to  
22 make a clarification of my objection. I think I understand  
23 the reason why the Board overruled my objection, and that  
24 is early on in this proceeding the Board determined that  
25 it would go into the general issue of fact that encompasses

NLS/eb4

1 the Duke system, the Duke plants.

2 What I am suggesting -- and I appreciate that;  
3 that's not the nature of my objection. Here what we're talk-  
4 ing about is a specific decision on Catawba that relates  
5 specifically to Catawba, and I do not see a nexus. I don't  
6 think the question tied in the over-all plan. That was the  
7 extent of my objection.

300

8 CHAIRMAN MILLER: Yes, I was proceeding on the  
9 other basis.

10 MR. RILEY: Mr. Chairman, if I may, the connec-  
11 tion is this:

12 Mr. Nash has made an adverse judgment on building  
13 an ISPSI at Oconee because it means investing present dollars  
14 for deferred use.

15 I'm simply pointing out that that has already  
16 been done in large magnitude at Catawba and that's part of  
17 this record. I'm asking him -- or I wish to ask him how  
18 he is able to favor it or at least not object to it in the  
19 case of Catawba while he favors it here.

309

20 CHAIRMAN MILLER: I think the problem is you are  
21 partly hypothetical and partly you're getting into a specific  
22 plant. And if you wanted to make it purely one-- Well,  
23 you'll probably have to make it purely a hypothetical if you  
24 wish to get into matters that are not covered by the record  
25 as to the main plants, and leave it there for your own

HRE/ebE

purposes.

MR. ROISMAN: Mr. Chairman, the record in Staff Exhibit Number 22 contains Mr. Spitalny's calculation of the reracking of the Catawba pools with poison racks, showing a capacity of 4700 fuel assemblies, and his calculations demonstrate that that is in excess of the capacity that Catawba would have.

So we do have in evidence what it is that Mr. Riley is asking.

CHAIRMAN MILLER: You have the numbers.

MR. ROISMAN: Yes. So I don't see why-- It doesn't even have to be a hypothetical or at a minimum, it's the Staff's hypothetical that he's asking the Staff witness about.

CHAIRMAN MILLER: All right, we'll let him answer.

Do you understand the question? We can take it by steps.

WITNESS NASH: I understand the question, and I think it is generally similar to one that Mr. Roisman asked yesterday.

At the time investments are made, decisions for investment to be made, you are always in a situation where you have to forecast the future. And as I indicated yesterday, I'm speculating somewhat, but at the time the decision was made to expend -- to build the Catawba pool at

WRE/eh

1 its present size, the knowledge that there would have to be  
2 long-term storage of spent fuel was rather new. There  
3 weren't many options known at that time for storing the  
4 number -- the amount of spent fuel which we now are faced  
5 with.

6 So I can at least foresee that the-- "foresee"  
7 may not be the proper word. But I can at least see that the  
8 knowledge that Duke had at the time seemed to indicate that  
9 expanding -- making a larger pool at Catawba was -- and as  
10 I indicate' yesterday, just merely adding to the size of  
11 an existing pool before you build it, knowing that you have  
12 to have spent fuel, adding to that is not a great expense.

13 And so that decision to do that was-- even though  
14 by hindsight we might say could be erroneous -- was not  
15 particularly costly.

16 BY MR. RILEY:

17 Q In this context, what do you mean by the phrase --  
18 quote -- "was not a great expense"?

19 A (Witness Nash) Well, it was not a great addi-  
20 tional expense to what already had been expended just to  
21 build the spent fuel pool, say, to hold one and one-half  
22 core, which was the old standard.

23 Q Do you say that in the sense that it was a small  
24 proportion of the cost of the originally planned fuel pool,  
25 or a small proportion of the whole plant cost, or simply

672 359

WRM/eb

a small dollar number?

A Not a small dollar number, at least in terms of -- on a personal basis but a small additional cost to that of the original size of the pool, and certainly a much, much smaller dollar part of the cost in proportion to the whole plant.

Q What is your basis for that testimony? Can you give us the dollar values?

A No, I cannot.

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Q Did you make a study of the cost increase in some past time, and do you have the dollar values?

A I did not make a study. This is based on my conversations with engineers on the NRC Staff, that merely expanding dimensions to something of this particular construction that already has to be built is not a great additional expense.

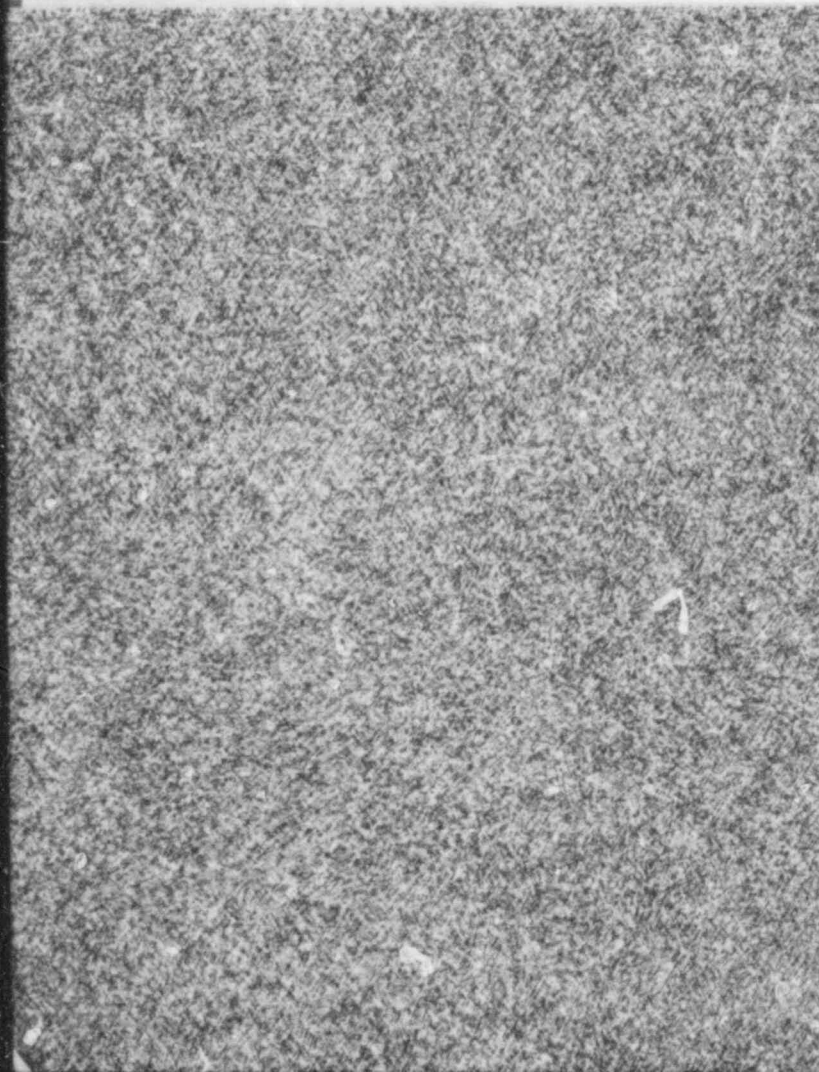
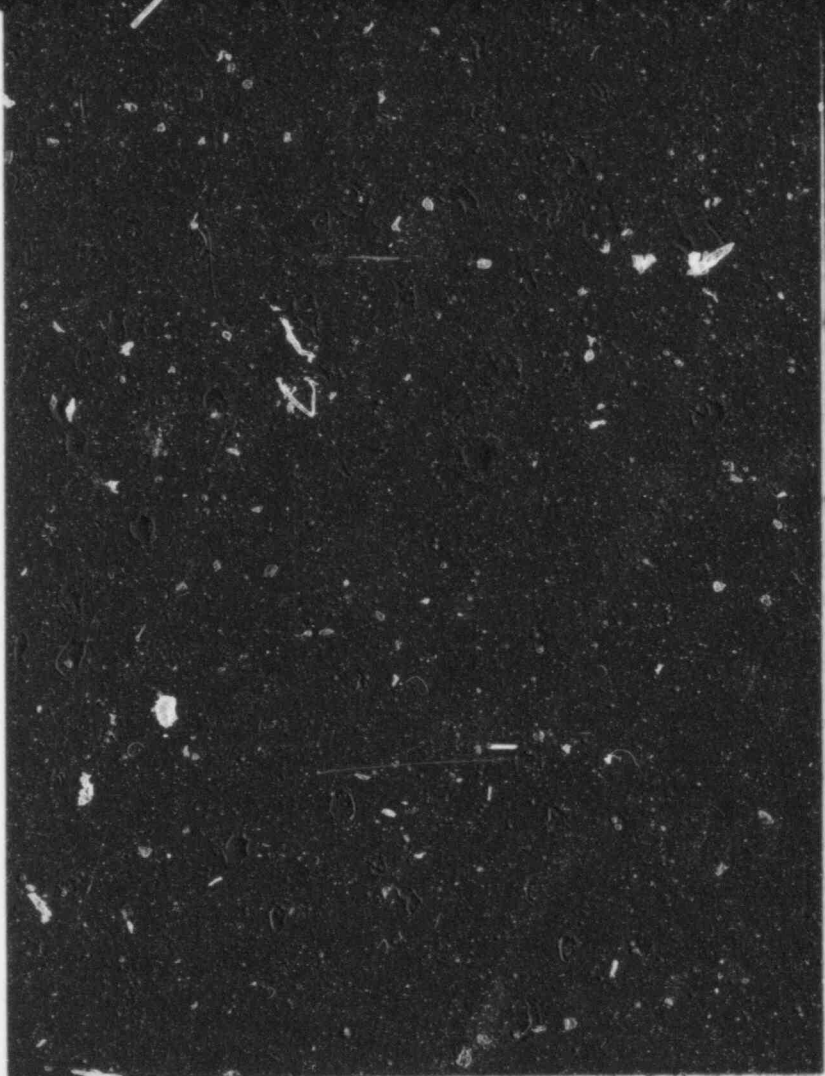
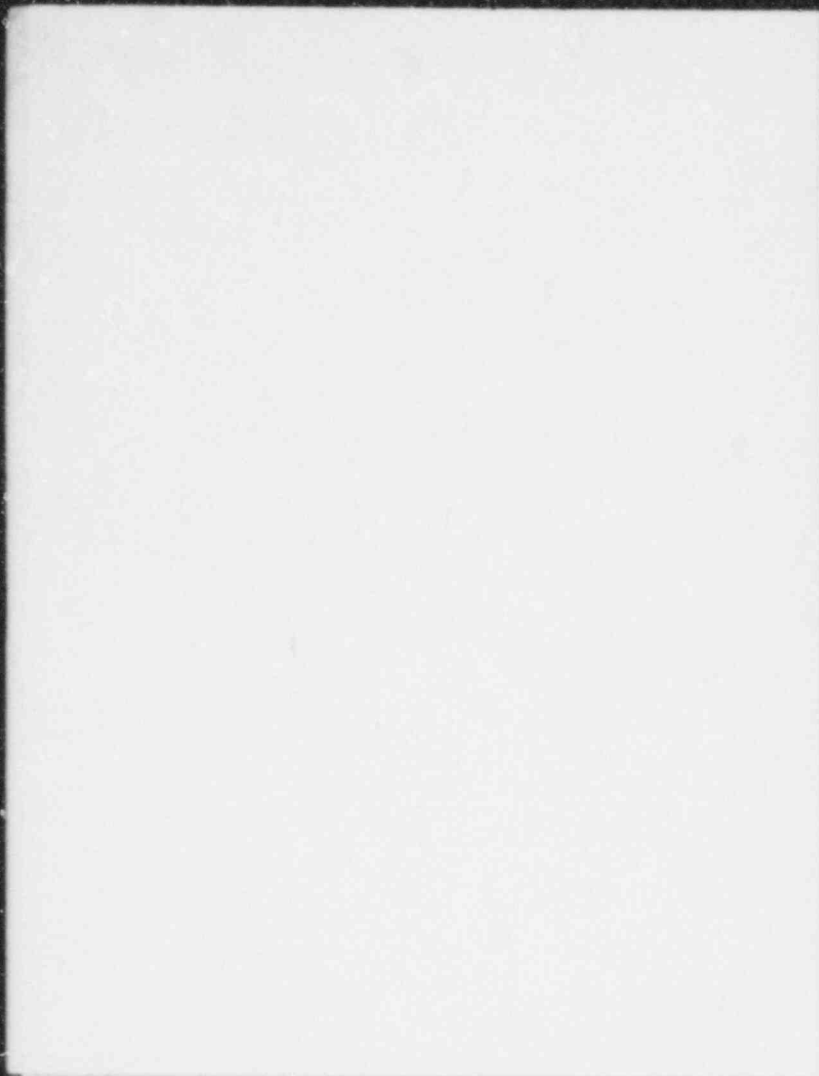
Q Can you recall whether they used dollar values or whether they used general terms such as you're using?

A General terms, I would say-- Well, I don't recall any dollar cost figures being in the discussion, but perhaps there were some percentage figures, and I can't cite those right now.

Q And the frame of reference in which they were operating was a project estimated at approximately a billion dollars; is that correct?

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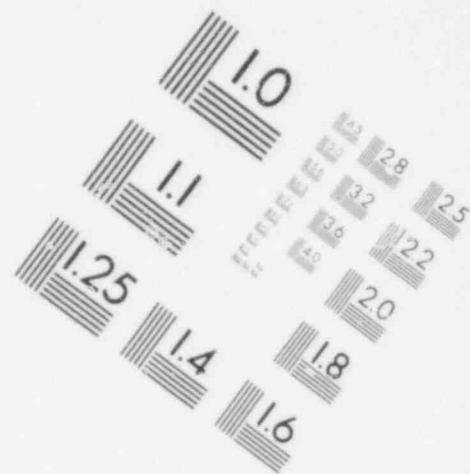
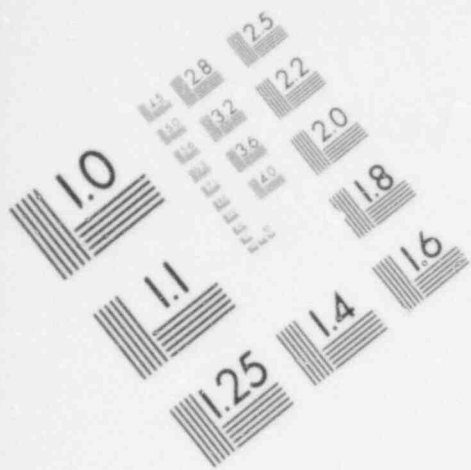
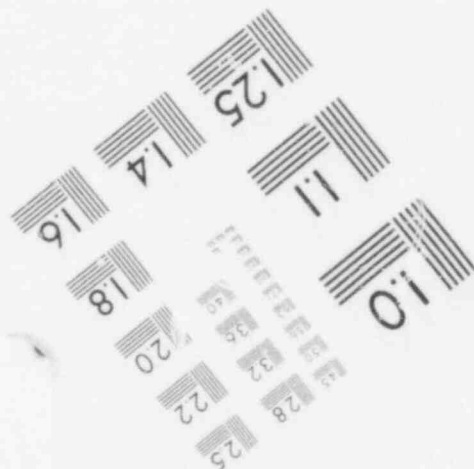
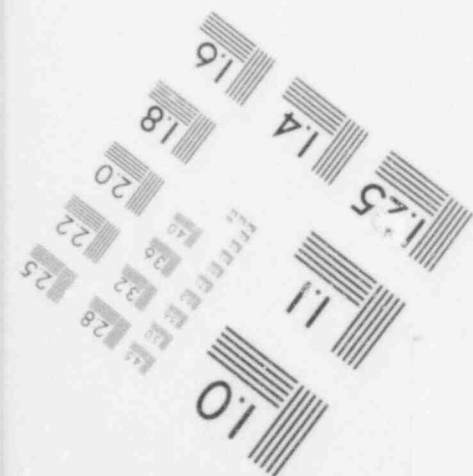
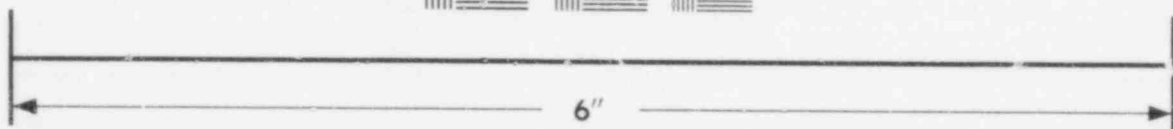


IMAGE EVALUATION  
TEST TARGET (MT-3)



WLB/ep8

1 A In that magnitude, yes.

2 Q What proportion of Duke's money is obtained by  
3 30-year mortgage refunding bonds such as those we were just  
4 looking at?

5 A I don't know.

6 Q Can you tell us what common utility practice is?

7 A Yes. This is the average for the industry. It  
8 was taken from Moody's Public Utility Manual, I think is the  
9 title.

10 Q Can you give us a date on that?

11 A 1977.

12 The correct title is Moody's Public Utility  
13 Manual. And for this particular issue, 1977.

The portion of the financing secured from various  
14 sources is bonds -- I'm rounding now -- 51 percent, pre-  
15 ferred stock, 12 percent, and common stock, 36 percent.

16 Q All right.

17 I would now like to show you page 23 of our  
18 Exhibit CBEG Exhibit Number 5. I submit it for your examina-  
19 tion. Section 3 is entitled "Capital Stock." And there's  
20 a table in it of preferred stock at \$100 par, et cetera,  
21 which I would like you to familiarize yourself with. And  
22 then read into the record the rate series for the last three  
23 issues.  
24

25 (Handing document to the witness.)

21. WRB/AB1

A The rate and series for the past three years?

Q The last three issues. And identify the years.

A The title of the table is "Preferred Stock, 100 par at December 31, 1978 and 1977 was as follows (dollars per thousand)."

You just want the rate and the series?

Q I only want the rate.

A Without the series?

Q You may give the series, certainly.

A 8.28 percent, Series K; 8.375 percent, Series L; 8.84 percent, Series M.

I'm not familiar with these designations; I'm not sure if that means the usual bond rating. I'm not sure. That's just the series of Duke.

Now I would make the same comment I did with the other table that I read from. There are other series that have lower percentages.

Q Thank you.

On page 3 of the same exhibit there's the question, "Are there any other reasons why such an ISFSI should not be built before it is needed?" And in the middle of your answer you state,

"Secondly, at some future time NRC or other regulatory bodies may conclude that protection of the public health and safety requires modifications

1 of the design or construction of spent fuel pools."

2 What is your reason for so thinking?

3 A The NRC has the responsibility, and continually  
4 investigates the existing nuclear facilities and proposed  
5 nuclear facilities, and continues to evaluate whether  
6 changes should be made in these facilities for protection of  
7 the public health and safety. And it is certainly a real  
8 possibility that they will determine that changes will be  
9 made in this type of facility.

10 Q Are you familiar with how long fuel pools have  
11 been in operation under NRC license?

12 A Yes.

13 Q How long?

14 A At least since the late 1950's, perhaps even  
15 earlier than that.

16 Q What's the track record on changes?

17 MR. KETCHEN: Objection. Changes to what?

18 BY MR. RILEY:

19 Q Changes to fuel pools of the sort that were  
20 discussed in the previous context.

21 A (Witness Nash) I'm not specifically aware that  
22 any changes have been made. The fuel pools are being used  
23 for long term storage now. And by "long term" I mean more  
24 than the cooling-off period that was originally contemplated  
25 for them. So I'm not sure we can take the past experience and

WRB/wr3

extrapolate forward completely.

1 Q You are concerned about protection of the public  
2 health and safety, modifications related to that. Do I under-  
3 stand your testimony that you do not have an historical  
4 basis for assuming that that will occur in the foreseeable  
5 future?  
6

4.030 7 A No.

8 Q It has been the testimony that something like  
9 forty-two plants have taken the reracking option at this  
10 point; is that correct?

11 A I believe that's the number, yes.

12 Q Do you know what the ratio of poison racks to  
13 other rack types is in that reracking?

14 A I do not.

15 Q How many plants have opted for independent storage  
16 facilities on site?

17 A I don't believe there are any. I could be mis-  
18 taken. I'm not aware of any.

19 Q In other reracking proceedings similar to this  
20 have you testified?

21 MR. KETCHEN: Objection.

22 CHAIRMAN MILLER: He may answer.

23 WITNESS NASH: Well, I testified at a reracking  
24 proceeding. It was more narrow than what has been the context  
25 of this hearing so far.

673 004

WITNESS

BY MR. RILEY:

Q At only one?

A (Witness Nash)

Q Did your testimony at that point favor the re-racking option?

A Yes. There were only two options being considered

Q You've heard testimony that at the G.E. Morris plant that the fuel pools are designed with a gate which will permit subsequent fuel pool expansion. The question is, Have you heard that testimony?

A I can't really say that I have. I was probably present, but I can't really say that I--

CHAIRMAN MILLER: Your answer is No; is that correct?

WITNESS NASH: That's right.

CHAIRMAN MILLER: Then just say No.

WITNESS NASH: No.

BY MR. RILEY:

Q All right. Let's hypothesize that it's in the record of this hearing, that there is testimony by Mr. Spitalny that at the G.E. Morris plant there is a gate in the existing fuel pool to facilitate subsequent expansion.

A (Witness Nash) All right.

Q Would not the most economic way of handling fuel pool growth, in terms of the economic analysis you present in

673 005

WR 1074

1 your testimony, be the building of incremental additions,  
2 each with its own expansion gate, of a size that was an  
3 optimum in terms of the compromise between money cost and  
4 the need of going back to building another addition?

5 A The first part of your question was-- If I could  
6 just ask you to repeat the first part. I have the rest.

7 Q What I'm asking is: from an economic analysis,  
8 if we are operating with, in effect, modules of fuel pool  
9 to an existing fuel pool, is there not an optimum size of  
10 addition to build on where there is a growth in the require-  
11 ment of the pool?

12 A Well if we assume -- and I presume you want  
13 me to -- that the only option is to expand spent fuel pools  
14 at a certain location, this requires quite a bit of engineer-  
15 ing judgment that I don't have. But from the standpoint of  
16 investment, it would seem to be advisable to build facilities  
17 as they are needed, rather than a large facility right at  
18 the beginning of the project. And so the modular additions,  
19 within my purview of knowledge, would seem to make some --  
20 would seem to make sense, yes.

21 Q Is it reasonable to believe that it would be  
22 possible to build too small a module, so that there is an  
23 optimum module size?

24 A I think that-- Well, in terms of size, some kinds  
25 of structures, there's a very unique minimum cost size, and

673 006



W.D.A. 1

2 for other kinds of structures this is a flat curve over a  
3 broad range of sizes, and in the latter category you have  
4 more flexibility in determining size, in the former one you  
5 would have to be very precise in your selection of size if  
6 you were to achieve the optimum size.

7 Q Mr. Pittiglio, I would like to turn to you.

8 Have you been following this colloquy?

9 A (Witness Pittiglio) Yes, I have.

10 Q In terms of the total amount of wall that would  
11 be required in a program where you added modules to an  
12 existing pool, too small a module would make for a great  
13 amount of wall material; is that correct?

14 A Yes.

15 Q All right.

16 Can you visualize, then, an optimum module size?

17 A There definitely would be one optimum size.

18 Now the size I can't visualize as far as how many assemblies.

19 Q I'm not asking for specifics. I'm just saying,  
20 Does the function have an optimum, in your judgment?

21 A In my judgment, yes, it would have an optimum.

22 Q And that would contain both the cost per unit  
23 area consideration and cost of money consideration that  
24 Dr. Nash called to our attention; is that correct?

25 A Among other things, yes.

Q With regard to the Morris pool, what provision has

673 007

WRE/wb:

1 been made for securing the liner in the fuel pool where there  
2 has already been a gate built in?

3 A I do not know.

4 Q How has the problem of differential settling  
5 of the new addition with respect to the original pool been  
6 addressed?

7 A I'm unfamiliar with that facility.

8 Q But you are familiar with the fact that there is  
9 such a facility with a gate built in for expansion?

10 A Yes, I am.

11 Q Now turning to the Environmental Impact Appraisal,  
12 Dr. Nash, page 58, you have discussed with -- you testified  
13 in response to Mr. Reisman's cross-examination about alterna-  
14 tives. And the alternative of building an addition to the  
15 existing fuel pool has been rejected; is that correct?

16 A (Witness Nash) Yes.

17 Q All right. Now let me ask a hypothetical.

18 The hypothesis is that we can solve the engineer-  
19 ing problem in building an addition onto Fuel Pool No. 3.  
20 Would not a determination of the optimum module size and  
21 added capacity in terms of the optimum module size be a more  
22 cost-effective approach than trying to build the entire  
23 capacity at once?

24 A Yes, I believe that's similar to my previous  
25 response, yes.

WRB/wb7 1

Q All right. We already have sunk costs--

2

A We're talking hypotheticals, now?

3

Q We have a hypothetical going.

4

In terms of sunk costs at Fuel Pool No. 3, the crane system, the fuel pool assembly handling system, and the cask handling system are all substantial cost items; is that correct?

7

8

If you would wish to defer to Mr. Pittiglio, you certainly may do so.

9

10

A I think he would give you a more reliable answer.

11

Q Mr. Pittiglio?

12

A (Witness Pittiglio) Yes, I agree with you; for that building they are substantial cost items.

13

14

Q So there would be a real cost saving if we could add modules to the existing pool and make use of the three types of facilities I referred to; is that correct?

15

16

17

A Yes, I agree with that statement.

18

I might comment that this hypothetical situation, the expansion was already designed into the existing pool; that's correct, right?

19

20

21

Q No, it is not. It assumes that an economical and, in an engineering sense, a reliable means could be found of adding capacity to the existing fuel in a module which would contain a gate ala Morris for further expansion.

22

23

24

25

MR. KETCHEN: Objection, Mr. Chairman. The

673 009

WFB/MS 1 hypothetical has now changed.

2 I want to make sure the witnesses are all respond-  
3 ing to the same hypothetical.

4 First it was just the engineering problems that  
5 could be solved. Now it's the engineering and economic  
6 problems could be solved. I think that changes it all around  
7 again.

8 CHAIRMAN MILLER: Yes, in fairness to the wit-  
9 nesses I think we should know exactly what the nature of  
10 the hypothetical is. If there have been changes or altera-  
11 tions in the assumptions you should state them.

12 MR. RILEY: We will regard as established by the  
13 witnesses' testimony there is an optimum module size--

14 CHAIRMAN MILLER: No; this is a hypothetical  
15 question. I'm asking you to frame the hypothetical question  
16 in such a way as whenever there's any modifications or other  
17 elements assumed or withdrawn that it's called to their  
18 attention.

19 MR. RILEY: Well I was not aware that a change  
20 had been made, although indeed I may have phrased such a  
21 change.

22 CHAIRMAN MILLER: The objection stated that there  
23 were. I don't really recall that closely what your hypo-  
24 thetical included with reference (a) to engineering, (b) to  
25 economic factors and (c) to any combination thereof.

WF 1/vhs

1 Why don't you just state it again, then.

2 MR. RILEY: We've already noticed -- and this may  
3 have been Mr. Retchen's stimulus--

4 CHAIRMAN MILLER: Never mind his stimulus. Tell  
5 us what's the hypothetical. The more we get into extraneous  
6 factors the more difficult it is for the witnesses to follow.

7 MR. RILEY: All right.

8 BY MR. RILEY:

9 Q What may have been thought of as an economic  
10 factor is the sunk costs in equipment--

11 CHAIRMAN MILLER: What about the sunk costs?

12 MR. RILEY: The sunk cost has to do with the--

13 CHAIRMAN MILLER: No; what are you assuming  
14 in your question.

15 MR. RILEY: Right.

16 BY MR. RILEY:

17 Q What I'm assuming is that an additional module  
18 will make use of the sunk cost that's in the cask pool, in  
19 the cask crane and in the fuel assembly handling crane and  
20 transport equipment. We're assuming that now has been paid  
21 for.

22 The hypothetical then is: If we find a satis-  
23 factory engineering solution -- and by that I mean it's not  
24 priced out of sight -- for making a modular attachment to the  
25 existing Fuel Pool 3 which lacks a gate, would this not be a

673 011

W.R. 10

less expensive approach to pursue than an ISFSI?

A (Witness Pittiglio) I would agree that that would be a less expensive approach.

I might comment that on a hypothetical situation if you could design those parameters into the system to allow for future expansion, including the crane, the structural walls, the pool liner and the gate, it would be at much less cost than having to modify and re-analyze an existing structure.

Q Now there are a number of advantages, then, that may be attributed -- and you have just listed some of them. Another of the advantages would be that it would be possible to share certain costs of existing facilities like ion exchange clean-up for the fuel pool water, as compared to an ISFSI; is that correct?

A That's correct.

MR. KETCHEN: Mr. Chairman, may I interject an objection here, just to preserve my record?

I would like to object to the hypothetical as phrased and move that the entire line of questioning be disregarded based on the part of the hypothetical assuming that the engineering problems can be solved at reasonable cost. Just for the record I would like to state that I think there's nothing in the record that supports that hypothetical, and under the Diablo Canyon decision I think it is an

673 012

1 VRF WILL inappropiate hypothetical.

2 MR. RILEY: Mr. Chairman, you did indicate, I  
3 believe, that CB&G might have the opportunity for putting on  
4 an engineering expert in this context.

5 CHAIRMAN MILLER: Yes.

6 MR. RILEY: So I think it is premature.

7 CHAIRMAN MILLER: I will overrule the objection  
8 for the reason that at this point it's simply testing the  
9 expertise of the witnesses, and so forth. It is not being  
10 received to prove the truth of that for which the hypothetical  
11 is stated, which is the distinction between the kind of  
12 hypothetical question I believe counsel alludes to.

13 Now if it is to have any significance or meaning,  
14 it will incumbent upon the examiner or someone else, if that  
15 be his position, to put on evidence and give the foundation  
16 to where it could then have significance.

17 Are we clear now on what you've accomplished  
18 and not accomplished?

19 You may proceed.

20 BY MR. RILEY:

21 Q Another advantage would be that in this type of  
22 a situation, as compared to an ISFSI, there would be no need  
23 to load spent fuel assemblies in the casks, move the cask  
24 to the side of the ISFSI on the plant site, unload it, bring  
25 it back, and so forth, which is a relatively slow process; is

WRE/wb. 2 1 that correct?

2 A (Witness Pittiglio) Yes, that's correct.

3 Q And the time involved in moving assemblies within  
4 the spent fuel pool by the conventional means of the traveling  
5 crane is very, very much less than the process of loading  
6 them in a cask and pulling them back out, etc.; is that cor-  
7 rect?

8 A Yes, that's correct.

28 f.s

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1 Q Now going back again to you, Dr. Nash, in many  
2 aspect of the operation of a nuclear generating system there  
3 is insurance of one sort or another. Is that correct?

4 A (Witness Nash) Yes.

5 Q Would it be, in your opinion, a reasonable ques-  
6 tion to examine the Applicant's insurance with respect to  
7 avoiding a shutdown of a generating plant due to lack of  
8 assembly capacity, assembly disposition?

9 MR. MC GARRY: Excuse me. I'll lost here. Are  
10 we discussing insurance?

11 MR. RILEY: That's correct. And the further  
12 questions will develop what I mean by "insurance" in this  
13 context.

14 MR. MC GARRY: I'll reserve my objection.

15 CHAIRMAN MILLER: You will have to connect it up  
16 to show it has some relevance.

17 WITNESS NASH: If I could clarify something, when  
18 I gave my previous response I thought of, you know, purchas-  
19 ing insurance. So you're talking about insurance against  
20 having to close down the facility. Is that not true?

21 MR. RILEY: That's correct, Dr. Nash.

22 CHAIRMAN MILLER: What are you referring to?  
23 Let's have it defined more clearly, Mr. Riley. There's all  
24 kinds of insurance. We have to know the nature of what we're  
25 talking about.

A.E./AM

MR. RILEY: Right.

In a sense this whole proceeding is a form of insurance against shutting down Decade, and in the Table of Alternatives on page 58 of the EIA, Dr. Nash has reviewed and agreed that the reactor shutdown would cost \$100 million a year, and if storage capacity onsite is exhausted and transshipment is interferred with, there is a potential for a substantial expenditure, depending on how long it is not possible to move casks offsite.

BY MR. RILEY:

Q Is that correct?

A (Witness Nash) Well, the development of means of handling spent fuel is continuing. There are a number of ideas that have been propounded. They haven't been tested very much over the --

Q Excuse me, Dr. Nash. I fail to see how that relates to my question.

CHAIRMAN MILLER: What is your question, Mr. Riley?

BY MR. RILEY:

Q My question is: Is there an advantage in insuring the continued flow of fuel assemblies out of a reactor that needs to be unloaded without delay? That's basically the question.

A (Witness Nash) Okay. Yes, to that question.

Q All right.

673 016

1 Now have you considered that the transshipment  
2 alternative is vulnerable to stoppage?

3 A I haven't taken that into direct consideration, no

4 Q Have you look at a map of the Oconee site with  
5 respect to the locations of roads, bridges, dikes?

6 A The Oconee site? No.

7 Q Right. Let me put forth a hypothetical then:

8 If there were one critical bridge or two critical  
9 bridges -- let's make it two critical bridges that were  
10 absolutely essential to move spent fuel off the Oconee site  
11 and these bridges, whether by flood, some sort of other  
12 accident, or sabotage not in the context of attack on the  
13 cask truck, were knocked out and there were delay until  
14 transportation could be resumed, and the Applicant was  
15 operating under circumstances where if their fuel were not  
16 moved out on schedule it would face a shutdown, would that  
17 not have a substantial economic consequence?

18 A Yes, it certainly would.

19 Q That being the case, would you regard as in-  
20 surance a margin of capacity, fuel assembly capacity storage  
21 onsite such that the plant was never entirely dependent  
22 upon the movement of spent fuel assemblies by transshipment?

23 A Yes, I would. And I would include in my answer  
24 the margin being what could be --

25 Q May I supply a phrase. "An economically feasible

WRS/eb4

margin"?

A I was going to say that if that margin includes a period of time where some adjustment could be made onsite -- in other words, there may be some further adjustment that could be made onsite.

Q Well, the assumption was that the site would be at its limit.

A At its limit. Okay.

MR. KETCHEN: May I have a clarification of that? There are two limits coming into issue in this case, Mr. Chairman. Could we ask the examiner to specify what he means by "limit"?

CHAIRMAN MILLER: Can you tell us which limit you're referring to, Mr. Riley?

MR. RILEY: Yes. The limit in this context is that there would be no more capacity for assembly storage without infringing on full core reserve.

CHAIRMAN MILLER: Very well.

Are we approaching the end of your examination, Mr. Riley?

MR. RILEY: We are, Mr. Chairman.

CHAIRMAN MILLER: All right.

BY MR. RILEY:

Q Would I be correctly construing your testimony as submitted that if there are no environmental or health

673 018

consequence differences between alternatives that in a cost-benefit way, cost becomes the sole consideration.

A (Witness Nash) No. The NRC does not require the Applicants to accept the lowest-cost option. Our primary concern is that we do not force options on them that are higher cost than achieve no environmental or safety public benefit.

Q I recognize that nice distinction. Under the National Environmental Policy Act, is it not the obligation of the Commission to affirm the alternative with the most favorable cost-benefit weighing?

MR. KEUGHER: Objection, Mr. Chairman.

CHAIRMAN MILLER: Sustained.

MR. RILEY: Mr. Chairman, I would like to interrupt long enough to say I understand why.

CHAIRMAN MILLER: Good. Now you see, we're training you to be a lawyer.

BY MR. RILEY:

Q Would your evaluation of cost-benefit in the context of a requirement to provide an "Environmental Impact Statement be different than in the context to provide an Environmental Impact Appraisal?

A (Witness Nash) There could be some difference. However, even there we have been admonished -- maybe I'm giving a legal interpretation. I don't know.

**POOR ORIGINAL**

673 019

WRS 126

1 ALAB 453, I believe it was. There was a directive  
2 not to spend so much time looking at the dollar cost of  
3 alternatives but to bring to the fore -- more to the fore-  
4 ground the environmental and safety aspects of alternatives.

5 Q Would you say that a reduction in power due to  
6 an inability to ship out fuel assemblies would weigh in  
7 this context, the possibility of brownouts or blackouts?

8 A Oh, yes. We would take very seriously the pros-  
9 pect of a shutdown of a power plant, especially for some  
10 reason like this which could be avoided with proper fore-  
11 sight.

12 Q And in an Environmental Impact Statement, would  
13 such material be the subject of a weighing in which you  
14 participated?

15 A Yes, as it was in the EIA.

16 Q Are your standards for weighing the same on the  
17 EIS and the EIA?

18 A There's less of a requirement to do a seeking of  
19 optimums in an EIA than there is in my EIS, in my under-  
20 standing.

21 Q Gentlement, that will conclude my examination.

22 CHAIRMAN MILLER: Thank you, Mr. Riley.

23 WITNESS NASH: Mr. Chairman, in response to one  
24 of Mr. Riley's earlier questions I said I had something back  
25 at the office, and I would like to give some information here

WRL/eh?

1 It won't change the substance of anything that I said, I don't  
2 believe.

3 CHAIRMAN MILLER: What does it relate to? I  
4 recall your discussing it.

5 WITNESS NASH: He asked if I knew the annual rate  
6 of inflation for the past three years.

7 CHAIRMAN MILLER: Do you wish that information,  
8 Mr. Riley? Apparently the witness can now supply it.

9 MR. RILEY: I requested it before. I would like  
10 it.

11 CHAIRMAN MILLER: Thank you, Dr. Nash. Go right  
12 ahead.

13 WITNESS NASH: This is as measured by the implicit  
14 price deflator which -- there are other measures of infla-  
15 tion which generally fall within a tenth of a percent or  
16 so of each other. And I can only give the-- You said for  
17 the past three years. You want that for what?

18 MR. RILEY: '76, '77, '78.

19 WITNESS NASH: I don't have 1978 here. But 1976  
20 is 5.2 percent; 1977 is 5.9 percent. And I believe that the  
21 inflation rate, the one that I don't have here for 1978,  
22 is something on the order of 9 percent.

23 So when I gave the average earlier of 6 to 7  
24 percent, I think that that is consistent with these figures.

25 BY MR. RILEY:

673 021

WRW/els 1 Q Considering that you don't have firm information  
2 on '73, would you please provide that for '75?

3 A (Witness Nash) 9.6 percent.

4 Q Thank you.

5 MR. RILEY: That's all.

6 CHAIRMAN MILLER: Thank you.

7 Mr. McGarry.

8 MR. MC GARRY: No questions, Mr. Chairman.

9 CHAIRMAN MILLER: Mr. Wilson.

10 MR. WILSON: No questions, Mr. Chairman.

11 CHAIRMAN MILLER: The Staff?

12 MR. KETCHEN: Mr. Chairman, I may have questions  
13 in four areas, but we're getting very close to lunch. I  
14 think it would be efficient if I could consider whether I  
15 want to ask them over the luncheon break.

16 CHAIRMAN MILLER: All right.

17 We will recess now and return at --

18 MR. ROISMAN: Before we recess, I had mentioned  
19 yesterday that I was waiting to get some documents that I had  
20 requested under the Freedom of Information Act. I've gotten  
21 them.

22 What they are are various drafts of the Environ-  
23 mental Impact Appraisal, the sections relating to alterna-  
24 tives. Most of them are drafts that were either prepared  
25 by Mr. Spitalny or Mr. Glenn, with some margin notes on the



WRS: gbs

drafts.

They raise about 30 minutes worth of questions that I would like to put to Mr. Glenn and Mr. Spitalny, and I would be glad to do that immediately after the luncheon break, or immediately after this panel is finished. It is my anticipation that the cross-examination of Mr. Carter by me at least will not go more than an hour, and that, in all likelihood, we will be able to finish up today, unless other parties have something longer that they intend to do.

But getting Mr. Glenn and Mr. Spitalny now would be advantageous if it is not intended to bring Mr. Glenn to Washington in September.

CHAIRMAN MILLER: Let me inquire about that.

Is Mr. Glenn available? He wasn't feeling very well last time I heard.

MR. MC GARRY: Before we get to that, I have an objection, so it may table that discussion. My objection is of this nature:

Mr. Roisman could have obtained this information at an earlier date.

MR. ROISMAN: That's false. I stated yesterday that I could not.

MR. MC GARRY: I don't mean receive it, Mr. Roisman, I said you could have requested this information a year ago, six months ago. I don't dispute that you

673 023

WRB/ablc

1 could not receive it until yesterday. My point is it could  
2 have been asked for. It could have been sought at a much  
3 earlier date.

4 Mr. Roisman could have had this information at the  
5 time the witnesses were on the panel, and therefore, I  
6 submit the witnesses have been excused, and there is no need  
7 for now, because Mr. Roisman has some later information that  
8 he could have obtained, to subject these witnesses to further  
9 cross-examination.

10 MR. ROISMAN: I made it clear at the time they  
11 were excused that I had this. Mr. Glenn was excused because  
12 he was ill -- that I intended to look at this and make a  
13 decision. I wasn't going to make him sit up there if he  
14 was ill anyway, but I did not acquiesce in "They're ex-  
15 cused" to now be told the next day that they were excused  
16 and I am irrevocably barred from dealing with them.

17 CHAIRMAN MILLER: I think the objection is a  
18 little different. I think the objection is you should have  
19 gotten the information sooner and hence been able to do it  
20 as part of your cross-examination.

21 MR. ROISMAN: I think the short answer to that  
22 is it was not until we conducted the hearing in June that  
23 it became apparent to me -- and there was nothing I had  
24 seen before that -- the way in which this document was  
25 drafted and the interrelationship between Mr. Glenn and

MR. SPITALNY: Mr. Spitalny.

My request under the FOI was made on the Monday after the end of that hearing. There would have been plenty of time for me to have it in advance if the NPC -- and by the way, I hand-delivered it -- had complied with the request within ten days. They didn't do that and they didn't make it available for two weeks after they complied with the request -- that is, not available where I could get it.

I don't feel grossly at fault.

CHAIRMAN MILLER: All right. We wish it had been here earlier, but it sounds like a can of worms, to be frank about it. And it is an administrative proceeding. We do follow mostly the Rules of Evidence but I guess we have to bend them a little here and there.

In fairness it would seem that Mr. Roisman should be permitted to interrogate.

MR. ROISMAN: If it were going to be very long, I think --

CHAIRMAN MILLER: Then we don't bend as much.

MR. KETCHEN: To preserve my record I would like to join in Mr. McGarry's objection. As Mr. Tourtelotte said, he must have been looking over my shoulder because I was prepared to make the same objection for the same reasons.

There was a discovery process that we went through,

WF 1111  
1 and it ended. However, as you know, sometimes the Staff is  
2 created equally with all parties, sometimes we have advan-  
3 tages and sometimes we have disadvantages. One of the dis-  
4 advantages is the Freedom of Information Act which we comply  
5 with. And of course Mr. Roisman knows he can use that and  
6 we complied with it.

7 But I think under our, as you say, expeditious,  
8 efficient procedures, he should have discovered that material.  
9 I think he has been around long enough to know how the Staff  
10 operates. We go through several drafts of things. If he  
11 had wanted that information he could have asked for it on  
12 a discovery request and we would probably have given it to  
13 him.

14 I think this request, in support of my objection,  
15 just comes late, is out of time, and is delaying this process.

16 CHAIRMAN MILLER: The objections are noted and  
17 are of record.

18 You say you're going to have how much longer?

19 MR. KETCHEN: One other thing, Mr. Chairman. I  
20 have a problem, an impossibility problem. Mr. Glenn is not  
21 here. When Mr. Roisman did mention to me this morning when  
22 he walked in that he did want to speak to Mr. Glenn and  
23 Mr. Spitalny, I thought Glenn was here.

24 MR. ROISMAN: I saw him walk in the door an hour  
25 and a half ago.

WRB, 1011

1 MR. KETCHEN: That was my understanding, that he  
2 was here. But it's my understanding now he's out riding  
3 around routes around this area, and I don't know whether we  
4 can get him back.

5 CHAIRMAN MILLER: Well, I'd say over the lunch  
6 hour make an effort to get him back. If not, he'll have to  
7 go with Mr. Spitalny. Please have Mr. Spitalny available.

8 Let's move forward as expeditiously as we can.  
9 We would like to recess this hearing by at least noon to-  
10 morrow, giving time for whatever motions and things there  
11 may be. So let's at least shoot for that as our objective.  
12 And today, if we could finish testimony, we'd certainly like  
13 to.

14 Now how much longer, Mr. Ketchen, do you have with  
15 this panel?

16 MR. KETCHEN: I have about-- I'm going to debate  
17 with myself over lunch whether I'm going to ask any ques-  
18 tions at all, but if I do ask questions it will be about four  
19 questions, plus or minus a couple of questions.

20 CHAIRMAN MILLER: Well, let's return at 1:30.

21 (Whereupon, at 11:50 a.m., the hearing in the  
22 above-entitled matter was recessed to reconvene at  
23 1:30 p.m. the same day.)  
24  
25

673 027

AFTERNOON SESSION

(1:20 p.m.)

CHAIRMAN MILLER: Shall we proceed?

Before we proceed, the Board has a request to make of all parties, so perhaps I'll just read it into the record at this time. I don't know that it will affect you before September, but this is some information that we would find helpful.

The Board would like to ask all of the parties and counsel to prepare an exhibit for our September hearing. We'd like for this exhibit to present a tabulation in concise form of the time schedules or time intervals of critical events for all of the various options or alternatives which are under consideration in this proceeding, particularly as relates to the present state of facts, environmental, technical matters surrounding circumstances, and the like, as distinguished from the conditions which may have prevailed at the time that the application was filed, or the EIA was prepared, or events which now we would like to review in light of present or future projected situations.

We request that this be prepared. We don't mind, it could be done jointly or individually, however it is easiest for counsel. But this is the information that we would like to have in the record at our September hearing.

MR. ROISMAN: Excuse me. Mr. Chairman, do you wish that to be prepared by a party like NRDC that will have

1 no direct personal knowledge, but --

2 CHAIRMAN MILLER: Insofar as you can. Some of it,  
3 of course, you'll be getting from various scattered places  
4 in the transcript, from the cross-examination you've gotten  
5 some, perhaps not all. And perhaps you will perceive it a  
6 little bit differently in range than would the Staff or the  
7 Applicant.

8 So this will be bringing together, I think, and  
9 in a sense collating the information.

10 MR. ROISMAN: Do you want it in evidentiary form?  
11 That is, do you want it --

12 CHAIRMAN MILLER: We'd like to have it put in  
13 the record in some fashion.

14 Now, if counsel among themselves could agree as  
15 to what these factors are, tailoring them for your own  
16 positions if they vary, that would be fine, put it in the  
17 record. If not, then it might be necessary to have it  
18 identified in whole or in part by a witness.

19 MR. ROISMAN: The problem I have is that it is  
20 conceivable that the most likely person at NRDC to do it on  
21 the basis of direct knowledge is me. I have no problem with  
22 going on the witness stand and testifying, if someone wants  
23 to know where I would have found that in the transcript. And  
24 if I put it together, I would identify the transcript pages  
25 anyway. But --

1 CHAIRMAN MILLER: We wouldn't ask counsel to  
2 testify.

3 MR. ROISMAN: Well, the thing is, my experts would  
4 not normally be reading the whole transcript. I would be  
5 doing that for proposed findings. I have no problem -- in  
6 fact, I've been in the process of doing that anyway, of  
7 reading the transcript and identifying in the transcript  
8 where I think it supports a date that I might give.

9 But with the understanding that it probably would  
10 have been me that --

11 CHAIRMAN MILLER: That's sufficient. We're not  
12 now worrying about the technical foundation proof, as proof.  
13 We would like to have it identified. If it's in the transcript,  
14 fine. If it's witness so-and-so, fine. If it's a study  
15 you've had prepared.

16 In other words, we're not being technical about  
17 the nature, but we would like to have the foundation identi-  
18 fied so we'd know what it rests upon, and then the triggering  
19 dates or the dates of commencement or the dates of completion  
20 of these various events. It would help us to have the whole  
21 range before us.

22 MR. MC GARRY: Mr. Chairman, an observation. It  
23 seems to me this is a working tool for not only the Board but  
24 for all parties, and I think Mr. Roisman has come up with a  
25 good suggestion. If we don't come up with a joint exhibit,



1 that we simply refer to where in the record we support our  
2 date, and so be it.

3 CHAIRMAN MILLER: Fine.

4 MR. MC GARRY: And then at least the Board and  
5 the parties will have the impressions of the other parties.

6 I just want to make clear I don't -- this is not  
7 an evidentiary item. It's a working tool, as I characterized  
8 it. We're not going to be responsible for providing a witness  
9 to give this document, and we won't have further cross-examina-  
10 tion on this?

11 CHAIRMAN MILLER: No.

12 MR. MC GARRY: It's a compilation of what has  
13 transpired.

14 CHAIRMAN MILLER: That's correct. It is a working  
15 tool. If you can't discern, or where there's nothing in the  
16 transcript and so forth, you might even agree what a witness  
17 would say if called. I mean we're trying to get the facts,  
18 and we're not trying to get into a technical situation  
19 requiring a witness, and so on.

20 MR. ROISMAN: You want this by September 4 or  
21 by September 10?

22 CHAIRMAN MILLER: Probably the 10th. I mean we  
23 want you to have sufficient time, and you'll be working on  
24 other things, and so forth. So the 10th would be an adequate  
25 proffer date.

1 MR. KETCHEN: Mr. Chairman, I want to make sure I  
2 understand your request.

3 You started out and I understood it to be we were  
4 not limited to the record, and it's my understanding that if  
5 the information comes from without the record, any way we can  
6 get it --

7 CHAIRMAN MILLER: Identify it.

8 MR. KETCHEN: -- to make the situation more  
9 current, as opposed to, say, what it was six months ago, or  
10 a year ago. But you want the current information on some  
11 schedule dates?

12 CHAIRMAN MILLER: Yes.

13 MR. KETCHEN: Thank you.

14 CHAIRMAN MILLER: Current and projected future.  
15 What we're doing is updating, essentially, you see. If it's  
16 in the record, and probably most of it is, that will be fine.  
17 But there may be areas where it's not. Identify it.  
18 You're right, it's a working tool, Mr. McGarry.

19 MR. WILSON: Mr. Chairman, as I understand the  
20 schedule you have been discussing, these do relate -- at  
21 least if my understanding be correct -- basically to alterna-  
22 tives in the selection of these particular methods. And,  
23 of course, that is not one aspect of the State's interest  
24 in these proceedings, to the degree that it is of the other  
25 parties. And at this time I cannot perceive a real interest or

1 need for the State's involvement in this joint effort. I  
2 would simply point that out for the Board's understanding.

3 CHAIRMAN MILLER: Yes, we understand. To the  
4 extent the State may have an interest, fine. If it does not  
5 have one, you are not required to.

6 MR. WILSON: Thank you, Mr. Chairman.

7 CHAIRMAN MILLER: All right, I suppose we're  
8 ready now to proceed. Mr. Keichen, I think you were ready  
9 to start your examination?

10 MR. MC GARRY: Mr. Chairman, excuse me for  
11 not wrapping, but just before the recess I indicated that I  
12 would check on some financial information Mr. Riley had  
13 inquired about, and directed my attention to page 24 of  
14 CISC Exhibit 8.

15 I'm looking at a category entitled, "Number 4,  
16 Long-Term Debt," and a column captioned, "Series," and  
17 another column captioned, "Year Due."

18 The Years Due that I am referring to are 2006,  
19 2007 and 2008.

20 Mr. Riley had inquired as to the date of issuance  
21 of those bonds. The dates are as follows:

22 For the year 2006, the date of issuance was 1976.

23 For the year due 2007, the date of issuance was  
24 1977.

25 For the year due 2008, the date of issuance was

19 7  
1 1978.

2 CHAIRMAN MILLER: Thank you, Mr. McGarry.

3 Any of you who wish to remove your jackets please  
4 feel free to do so. I'm afraid our thermostats are set to  
5 the 71°, or whatever it is.

6 Whereupon,

7 CLAYTON PITTIGLIO

8 and

9 DARREL A. NASH

10 resumed the stand as witnesses on behalf of the NRC Regulatory  
11 Staff and, having been previously duly sworn, were examined  
12 and testified further as follows:

13 REDIRECT EXAMINATION

14 BY MR. KETCHEN:

15 Q Dr. Nash, following the close of yesterday's  
16 hearings, did I call you up on the phone and arrange to  
17 provide you with a copy of yesterday afternoon's transcript  
18 and ask you to review it?

19 A (Witness Nash) Yes, you did.

20 Q And did I indicate to you that I might ask you  
21 some questions on the transcript?

22 A Yes.

23 Q All right. Dr. Nash, do you have a copy of the  
24 transcript with you now of yesterday afternoon?

25 A Yes.

673 034

1 Q All right. And also, if you will, I'll be asking  
2 you some questions about the Environmental Impact Assessment,  
3 if you'll have that available.

4 Okay. Dr. Nash, it's my understanding that you  
5 testified yesterday that you first came -- well, we'll just  
6 repeat again.

7 Will you just repeat again when you first became  
8 involved in any participation in the analysis of the proposed  
9 transshipment action?

10 A It was March or April of 1979.

11 Q Would you explain the circumstances of how you  
12 became involved in the analysis of the proposed transshipment  
13 action?

14 A If I can recall, I believe what I remember is Mr.  
15 Spitalny contacted me about the same time, and indicated that  
16 there was to be a hearing on this matter and that some further  
17 analyses would be required beyond what was contained in the  
18 EIA for purposes of the hearing.

19 Q All right, sir. Would you explain or describe  
20 any information that was given to you at that time?

21 A Let's see. I was given the EIA, and quite a  
22 stack of other material that had been I think received on  
23 discovery, and so forth, that related to this case.

24 Q Did you require additional information?

25 A Yes, I did.

1 Q And how did you obtain that information?

2 A Well, the specific request for my assistance was  
3 that there had been contentions submitted, three, from NREB,  
4 and so I needed information to prepare testimony in answer  
5 to those contentions, which I prepared questions for and sent  
6 to the Applicant, or they were directed to the Applicant.

7 Q And I assume you obtained a response to that  
8 request?

9 A That is correct.

10 Q And is that in this record?

11 A The response itself is not in the record.

12 MR. MC GARRY: Mr. Chairman, may I interrupt here  
13 for a moment? I have discussed the matter of Duke's responses  
14 to Staff's request with counsel.

15 I must admit, I did discuss this with Mr. Blum  
16 and not with Mr. Riley, but with respect, at least, speaking  
17 for Mr. Blum and I think Mr. Riley will agree with this, we  
18 will at the close of today perhaps request that Applicant's  
19 responses to the Staff's request be received into evidence  
20 for the fact that Applicant responded, not for the truth or  
21 accuracy.

22 CHAIRMAN MILLER: All right.

23 MR. KETCHEN: That's all I'm getting at. I'm  
24 trying to get somewhere. These are foundation type things.

25

1 BY MR. KETCHEN:

2 Q Do you have a copy of the information with you  
3 that was furnished in response to your request?

4 A (Witness Nash) Yes, I do.

5 Q Can you identify that by some date? Do you have  
6 it in your possession right now?

7 A Yes.

8 Q Just to help you along, and lead a little bit,  
9 would that be a letter dated April 23rd, 1979 to Mr. William  
10 J. Dircks, Director, Office of Nuclear Material Safety and  
11 Safeguards, signed by William O. Parker, Jr., showing a  
12 service list showing that it was served on all parties, in  
13 this case with an attachment entitled, "Responses to NRC  
14 Questions 1 through 8 (Number 3 withdrawn)"

15 A I don't have the cover letter that you identified.  
16 I have the responses to -- what I have is a document called  
17 "Responses to NRC Questions 1 through 8."

18 MR. MC GARRY: Mr. Chairman, I hate to keep  
19 interrupting, but perhaps it would be easier if right now  
20 I request that the matter I've just discussed be received  
21 in evidence, so that the Board and the parties will have the  
22 documents before them.

23 CHAIRMAN MILLER: Fine. I think that would be  
24 helpful.

25 MR. KETCHEN: Well, before you do that, let's get

we 11

of one too.

CHAIRMAN MILLER: Yes.

(Documents distributed.)

MR. MC GARRY: Mr. Chairman, just for clarity --  
I can go through this very quickly -- Applicant's Exhibit 23--  
and I'd just like them to be marked A through however far we  
go --

The first one is May 10, 1978. That would be  
23A.

April 23, 1978 would be 23B.

September 27, 1978 would be 23C.

October 25, 1978 would be 23D.

October 20, 1978 would be 23E.

October 18, 1978 would be 23F.

June 16, 1978 would be 23G.

June 5, 1978 would be 23H.

And I request they be received into evidence.

CHAIRMAN MILLER: Any objection?

(No response.)

CHAIRMAN MILLER: They will be received in  
evidence.

MR. ROISMAN: Mr. Chairman, for the limited  
purpose offered?

CHAIRMAN MILLER: For the limited purpose offered.

MR. MC GARRY: Thank you, Mr. Chairman.



(The documents referred to were marked for identification as Applicant's Exhibits 23A thru 23 H, and were received in evidence.)

BY MR. KETCHEN:

Q Dr. Nash, do you also have a copy of a document with you entitled -- well, dated May 7, 1979, to Mr. William J. Dircks, submitted by Mr. William O. Parker, Jr., with an attachment --

CHAIRMAN MILLER: What exhibit number would that be, Mr. Ketchen?

MR. KETCHEN: I believe it's 23D of the Applicant.

CHAIRMAN MILLER: Is that correct, Mr. McGarry? May 7, 1979 to Mr. Dircks from Mr. Parker?

MR. RILEY: I think you may have missed the May 7 letter, Mr. McGarry.

MR. WILSON: Mr. Chairman, could we get the dates again of the letters?

CHAIRMAN MILLER: I think perhaps we had better. We're not quite in the same order in which we have them. Therefore, we're not certain.

MR. MC GARRY: It would be 23A'. Thank you, Mr. Riley.

MR. WILSON: Would it be too much trouble to go through those, A through E, just to identify them? Because I think we did have some differences in dates in the order they were in.

CHAIRMAN MILLER: All right. Yes.

MR. MC GARRY: I thought it would be -- I'm sorry to labor the record, I thought it would be speedy.

May 10, 1979 is 23A.

May 7, 1979 is 23A'.

April 23, 1979 is 23B.

November 27, 1978 is 23C.

October 25, 1978 is 23D.

October 20, 1978 is 23E.

October 18, 1978 is 23F.

June 16, 1978 is 23G.

June 5, 1978 is 23H.

MR. ROISMAN: What about August 23?

MR. MC GARRY: And August 23 1978 should be 23F'.

CHAIRMAN MILLER: What is June 5, 1978?

MR. MC GARRY: That's 23H.

CHAIRMAN MILLER: June 16, then, is G?

MR. MC GARRY: That's correct, Mr. Chairman.

CHAIRMAN MILLER: All right. I think we have it

(The additional documents referred to were marked for identification as Applicant's Exhibits 23A<sup>o</sup> and 23F<sup>o</sup> and were received in evidence.)

MR. KETCHEN: Mr. Chairman, I want to talk about what is now 23A and 23A<sup>o</sup>, and I want to make sure the witness-

CHAIRMAN MILLER: All right, show them to him.

(Documents handed to the witness.)

1 (Witness reviewing document.

2 WITNESS NASH: What I have is not an exact  
3 replica, but the wordings are the same for the questions that  
4 I submitted.

5 BY MR. KETCHEN:

6 Q When you say it is not an exact replica, what  
7 do you mean?

8 A (Witness Nash) As I recall, this must have been  
9 the Telefax copy.

10 MR. ROISMAN: Mr. Chairman, let the record show  
11 that in order to speed this up I'm giving the witness my  
12 copy of 23A and 23R'.

13 CHAIRMAN MILLER: Very well.

14 You may proceed.

15 MR. KETCHEN: You want me to give him my copy?

16 MR. ROISMAN: No, I'll give him mine, I just  
17 want you to ask the questions.

18 BY MR. KETCHEN:

19 Q Now Dr. Nash, you've described a pile of informa-  
20 tion here. Is this the type of information that you would  
21 normally have available to you in preparation or in fulfilling  
22 your function as an NRC Staff member in the cost-benefit  
23 section of the agency?

24 A (Witness Nash) Yes. If this information is not  
25 already provided say at the time the effort was begun, then

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we) a)

1 we would request this type of information from the Applicant  
2 and perhaps seek out other sources if we felt it necessary.

3 Q Have you independently examined the information  
4 provided to you and made a judgment about its reliability?

5 A Yes, I have.

6 Q Is the information that you had and have available  
7 to you the type of information that you would customarily  
8 rely on in performing your work?

9 A Well, yes, we keep up with information sources of  
10 this type and when we're making an evaluation we use that  
11 information as well as that from the Applicant, one of the  
12 primary purposes being to verify the validity of information  
13 supplied by Applicants.

14 Q I would like to direct your attention, Dr. Nash,  
15 to page 58, Table 10-1 of the EIA -- Strike that.

16 I would like to direct your attention to page 52  
17 of the EIA, I'm sorry.

18 A All right.

19 Q Under Section 9.4, I would like you to read the  
20 first sentence.

21 A "Two methods exist for expanding the  
22 spent fuel pool capacity at Oconee Nuclear  
23 Station: physical expansion of the pool  
24 and reracking with closer spacing between  
25 assemblies."

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1 Q Okay.

2 I don't want to go through all this, but going  
3 to page 53, would you read the first sentence of the second  
4 paragraph.

5 A "Reracking the spent fuel pools  
6 serving Oconee 1 and 2 would leave a shortage  
7 of storage space for an interim period of time.  
8 The estimated time delay in completing the re-  
9 racking of this pool is 15 months."

10 Q Also on page 53 -- I won't go through that exercise  
11 again, Dr. Nash, but I'd like you to examine the final para-  
12 graph -- I'm sorry, the final paragraph first and second  
13 sentence and, if you want to, the whole page.

14 I'm particularly interested in you being familiar  
15 with the first and second sentence of the last paragraph on  
16 that page, starting with the time required to rerack the  
17 basin.

18 A All right. I've read through most of that para-  
19 graph.

20 Q Okay.

21 Now at this point, Dr. Nash, I would like you to  
22 turn to Table 10-1, page 58 of the EIA.

23 A Yes.

24 Q And I would like you on the benefits column --  
25 One second.

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(Pause.)

Benefits column, fourth paragraph down, I would like you to read the entire paragraph. It's short.

A You're saying Table 10-1?

Q Right. Right-hand column, the far right under the benefits section, column, fourth paragraph down.

A All right.

"Continued operation of Oconee Units 1, 2 and 3 and production of electricity. This option is taken to be viable but does not meet the immediate needs of the Applicant."

Q And did you misread the first sentence?

You said electricity. Does your copy say electrical energy?

A Electrical energy, that's correct.

Q All right.

At this time, Dr. Nash, I would like you to turn to transcript page 3529, lines 10 through 15. The question was asked:

"So that to that extent this cost-benefit analysis, as it appears in Table 10-1 and as it was when you did your review, actually had left out not only a viable alternative but one, in fact, that the Applicant has chosen to pursue? Is that not true?"

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1                    You answered, "Yes."

2                    I would like to ask you at this time if you can  
3 explain or would like to clarify your answer in light of the  
4 material I have directed you to in the previous few minutes.

5                    A            Well when I did my review and prepared testimony  
6 it was my understanding that the reracking was still in  
7 question as to whether it would be completed on time.

8                    I don't recall exactly when -- I think it was  
9 some time in June or perhaps late-May when I was aware that  
10 the reracking option may be more viable than I had understood  
11 earlier.

12                    Q            Okay. I'm not sure that's -- well, I'd like to  
13 ask another question, Dr. Nash.

14                    Let me refer you to line 12 of that page, where  
15 the question said -- well, line 11 and 12 -- or part of the  
16 question was in Table 10-1 and as it was when you did your  
17 review actually had left out not only a viable alternative,  
18 and refer you to Table 10-1 to the material you've just read.

19                    A            Yes.

20                    Q            And ask you if you want to clarify your answer.

21                    A            Okay.

22                    Certainly at the time of the preparation of the EIR  
23 Table I was correct, to the best knowledge of the Staff,  
24 and at that time that option would not have been left out  
25 because it was the Staff's belief that that wasn't an option.



1 And when I reviewed the EIA, I thought that would continue  
2 to be the case.

3 Q Thank you, Dr. Nash.

4 One other question: I'd like to refer you to  
5 page 3562 and also pages 3563 through 65. If you would glance  
6 at those pages for one moment.

7 A Starting with where, on page 3562?

8 Q 3562. I'm particularly interested in the question  
9 on line 19. In that question there is a word or a phrase  
10 "quick look." The whole question reads:

11 "Well tell me something, in light of  
12 the history of this case, why are you placing  
13 so much confidence in the ability of a quick  
14 look to warn you of the possibility of serious  
15 problems?"

16 And that word is also used again on 3563, 3564  
17 and 3565. And I would like to ask you, in the context of  
18 participation in this case, what you understood or what your  
19 definition of the terminology "quick look" meant.

20 (Witness reading document.)

21 Q I'm sorry, let me add something to the question.  
22 Either the words "quick look" or "quick judgment," the terms  
23 are used sort of interchangeably.

24 (Witness continuing to read document.)

25 A Well Mr. Roisman, on page 3564 he says -- well,

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I'll read the part. He says:

"I mean, it's still the case that you have not done -- and by quick judgment, I mean to contrast that to sort of sitting down and doing an at your desk on a piece of paper detailed analysis of such things as whether there really will be a group of viable options available and so forth."

I'm not sure that my previous answers had a real clear understanding of what his use of the word "quick judgment" meant but I believe he had in mind -- well my understanding of his question was that the analysis that appeared in the EIA and perhaps some other subsequent testimony would be categorized as quick judgment and that a more -- something more than has been done now would be required to go beyond what he would characterize as quick judgment.

Q How long was the EIA under preparation by the Staff, do you know?

MR. ROISMAN: Objection. The witness testified yesterday he didn't even get involved with this until four months after the EIA was prepared.

CHAIRMAN MILLER: I believe that is the state of the record, unless the witness wishes to change his testimony. The previous testimony shows he wouldn't know.

MR. KETCHEN: All right.

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BY MR. KETCHEN:

Q One final question, Dr. Nash, on line nine -- or line eight where it says:

"I mean to contrast that" -- that referring back to quick judgment -- "to sort of sitting down and doing an at your desk on a piece of paper detailed analysis of such things...."

Are you with me?

A (Witness Nash) Yes, I am.

Q Which did you do?

A Well it was a detailed analysis, in my evaluation. I think what I did not do -- because, as I testified yesterday I didn't feel that it required going to that extent -- was to seek an overall optimum or at least cost option type -- I attempted to place the options on the equivalent bases but did not take a further step of seeking an optimum solution to either a short-term or a long-term spent fuel storage problem.

MR. KETCHEN: Thank you, Dr. Nash.

That completes my redirect of this panel,  
Mr. Chairman.

CHAIRMAN MILLER: Any further questions?

MR. ROISMAN: No, Mr. Chairman.

MR. MC GARRY: No, Mr. Chairman.

CHAIRMAN MILLER: Apparently not.

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Thank you, gentlemen, you will be excused.

(The witnesses excused.)

CHAIRMAN MILLER: Call your next witness.

MR. KETCHEN: Mr. Chairman, I would like to call Mr. Carter to the witness stand. Mr. Carter has been previously sworn, Mr. Chairman.

Whereupon,

T. JERRELL CARTER

resumed the stand as a witness on behalf of the Regulatory Staff, and, having been previously duly sworn, testified further as follows.

MR. KETCHEN: Mr. Chairman, I've completed my direct of Mr. Carter. His testimony is reflected in Staff Exhibit Number 18A and B, if I recall.

CHAIRMAN MILLER: All right.

Any cross-examination?

MR. ROISMAN: Yes, Mr. Chairman.

I think Mr. Ketchen wants to wait one moment.

(Pause.)

MR. KETCHEN: I might point out that there was a question raised yesterday -- I'm sure Mr. Roisman remembers -- but he had reserved the question that had been asked of Mr. Spitalny about what factual information Mr. Carter had about breaching a spent fuel pool.

At this point, Mr. Chairman, I would like --

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1 that completes my direct and he's available for cross-  
2 examination.

3 MR. ROISMAN: As long as we have that, let's get  
4 it out of the way.

5 CROSS-EXAMINATION

6 BY MR. ROISMAN:

7 Q What was the information that you transmitted to  
8 Mr. Spitalny yesterday on the question of breaching the  
9 containment?--I'm sorry, that'll be another day-- breaching  
10 the spent fuel pool for an addition to that pool?

11 A I indicated to Mr. Spitalny that approximately  
12 15 years ago while working for another organization I was  
13 involved in the decommissioning of a reactor. And at that  
14 time, one consideration was how to remove concrete such as  
15 breaching and cutting open the spent fuel storage pool.

16 We did at that time consider the flame cutting  
17 that we talked about yesterday where you would burn concrete  
18 into segments and could remove it. This was discarded because  
19 of the difficulty in containing dust particles, radioactive,  
20 around the reactor possibly. We did not do it. The burning  
21 technique was used then primarily for thin concrete structural  
22 members.

23 The second point that I mentioned to Mr. Spitalny  
24 was related to a more recent occurrence while I was with NRC.  
25 I'm aware that the utility at the Fitzpatrick reactor did

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2 consider a separate pool with a transfer canal for fuel. They  
3 had a meeting with the Staff where they discussed this.  
4 Subsequently, the concept was dropped. For economics, we did  
5 not go that way.

6 These are the two instances referred to  
7 Mr. Spitalny, that I related to him. The information,  
8 obviously, with my prior working history, is not on the NRC  
9 record, and the Fitzpatrick would be only in the meeting  
10 minutes, there was nothing in the way of an application from  
11 the Licensee.

12 Q Is that now operating or under construction,  
13 what's its status?

14 A Fitzpatrick, operating.

15 Q And this was -- just so we're clear about it,  
16 this was a proposal in which they were giving some considera-  
17 tion to expanding spent fuel storage capacity, is that --

18 A That's correct.

19 Q Looking at Staff Exhibit 18A, Mr. Carter, on  
20 the first page, the very first sentence states what's now  
21 become almost a truism in this area that there is no require-  
22 ment of the Staff that for safety reasons that one must  
23 maintain a full core discharge capability.

24 And then on page four, in the first full paragraph  
25 in the middle of that paragraph, speaking of the advantage of  
maintaining full core discharge capability, you say:

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2 "The benefits from prudent design in  
3 the availability of the facility and reduction of  
4 man-rem exposures for inspections and repairs are  
5 self-evident."

6 Can you tell me, what did you have in mind when  
7 you referred to the reduction of man-rem exposures?"

8 A In this case and as mentioned in the testimony,  
9 there are operational occurrences that may come up at a plant  
10 that would be perhaps done easier if the fuel were unloaded  
11 from the reactor vessel. In not all cases would it be mandatory  
12 for the fuel to be removed nor would it be necessary for it  
13 to be immediately removed, you could wait for the fuel to  
14 decay.

15 I again have thought of the reactor vessel  
16 inspection, you may have repair of piping systems attached  
17 to the reactor vessel.

18 Q You said make it easier. Do you mean have lower  
19 exposures to the workers or do you mean some other kind of  
20 easier?

21 A Lower exposure to the workers in the context of  
22 your earlier question.  
23  
24  
25

1 Q Do you have a general knowledge of how the ALARA  
2 principle works when applied to occupational exposures?

3 A In a general sense.

4 Q Is it true that if one were proposing to conduct  
5 any activity where workers might be exposed to the radia-  
6 tion coming from the core itself that the ALARA principle  
7 would be applicable and that you would look at the ALARA  
8 concept to see what is the best way to accomplish the  
9 particular task in light of the ALARA goals? Is that your  
10 understanding of it?

11 A That's my understanding, yes.

12 Q If you have a facility which does not have a full  
13 core reserve available in its spent fuel pool, and you are  
14 examining a proposed -- let's say in-service inspection  
15 technique to be followed by the workers and your only option  
16 is to either leave the fuel in place and conduct the in-  
17 spection or to remove the fuel, one by one, and transship  
18 it out to wherever you found storage space available, if  
19 those were your two options, in that case would you expect,  
20 just from your general knowledge, that the cost of the  
21 removal and transshipment out to another site would far  
22 exceed any benefits that you might get to the workers in  
23 taking the fuel out for purposes of the in-service inspec-  
24 tion?

25 A I would expect that would be the case but I have



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never been called upon to do that type of an assessment.

Q I understand.

If that is so, then would it be fair to say that the failure to require a utility to retain a full core reserve might then have the utility be in a position where because of the nature of the ALARA balancing factors, workers were exposed to more radiation than they would have been exposed to if the full core reserve had been retained?

A It's possible. It's obviously a question of magnitude of exposure that they have. But your answer is correct.

Q Well, I'm really relying upon your statement about recognizing the benefits to workers on page 4 of Staff Exhibit 18-A, the benefits to workers of the reduction of man-rem exposures by having a full core reserve available. So I'm using whatever you meant there in terms of the benefits.

A That's correct.

Q Okay.

Now you mentioned one of the situations in which you might want to offload a full core. One of the situations is for the inspection of the vessel. Is that correct?

A That's correct.

Q Is that what is known as in-service inspection in the trade?

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1           A       That is a portion of the in-service inspection.  
2       The in-service inspection as I'm referring to it is a larger  
3       program of which the reactor vessel inspection is a portion.

4           Q       Is it your testimony that an in-service inspection  
5       as you understand it, can be conducted within what you would  
6       understand to be permissible limits without removing the  
7       full core from the reactor?

8           A       With some facilities, that is correct.

9           Q       Do you know if that is true for the Oconee  
10       facilities?

11          A       I do not.

12          Q       Did you hear the testimony yesterday from  
13       Mr. Spinalny or maybe even earlier than that, and it is some-  
14       what outlined in Staff Exhibit Number 22, indicating and  
15       operating on the assumption that a full core reserve would  
16       have to be able to be removed at certain specified times in  
17       order to do in-service inspections for the Oconee units? Do  
18       you remember that testimony?

19          A       Yes.

20          Q       Are you suggesting to me now that that testimony  
21       might not be accurate if Oconee is one of the facilities  
22       that does not physically require the removal of the core in  
23       order to conduct the inspection?

24          A       I don't know that I would say it's not accurate.  
25       I don't remember the context of whether or not the core had

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to be unloaded or should be for in service inspection is there or not.

Q Your testimony is, at least based upon your knowledge, it may be that you don't have to unload it in order to do the inspection?

A In some cases that's true.

Q Okay.

On page 2 of Staff Exhibit 18-A you indicate at the end of the paragraph that carries over from the previous page that the current practice appears to be the retention of 1-1/3 core for a single or 1-2/3 core for a dual-unit facility. That is what you start off with in the spent fuel pool, and that:

"The staff believes the above is an appropriate basis for selecting design storage capacity, and has informed applicants to this effect...."

Do you see that?

A Yes.

Q Okay.

Why has the Staff not concluded that it would be appropriate or more appropriate for a unit to have a lifetime storage capability in its spent fuel pool rather than 1-1/3 to 1-2/3rds?

A In the testimony in another location I do mention

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2 that we have had meetings, we have discussed the safety  
3 considerations that would require more than 1-1/2 or more  
4 than whatever in storage capacity.

5 The conclusions reached at that time were that  
6 spent fuel stored in a reactor vessel is stored in a safe  
7 place and that there was no immediate need, from a safety  
8 consideration, to unload the core. And for those two fac-  
9 tors we, the NRC, have taken the position, and as it's  
10 voice in the Standard Review Plan, that the 1-1/3 - 1-2/3  
11 core is an adequate design consideration.

12 The bottom line, as I would see it, is that fuel  
13 can be safely stored in the core.

14 Q Why doesn't the Staff then find that the appro-  
15 priate basis for selecting of the design storage capacity,  
16 looking at a single unit, is 1/3 of a core?

17 A That would be a basis. I don't know that any  
18 licensee has proposed that in the past, nor presently do  
19 they. If they did it would be conjecture whether it would  
20 be approved or not.

21 In all instances that I'm aware of, the proposals  
22 have been in the magnitude of 1-1/3 as opposed to 1/3 of  
23 a core. And the Staff has found that proposed value size  
24 acceptable.

25 If a licensee proposed more or less, it would be  
assessed at that time on its merit. Spent fuel obviously

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is a larger pool proposal. Some newer plants are proposing more. But as I stated here, it is not a requirement and we say this is a basis.

Q So your position is that you would not rule out approving a plant with as little as 1/3 of the core storage capability, or as much as a full lifetime, and all you've done is look at the applications that you've gotten, 1-1/3 being the most frequently seen, and that one is okay for the Staff without passing judgment on the others. Is that it?

A I think that's a true representation.

MR. ROISMAN: I have nothing further for this witness.

CHAIRMAN MILLER: Mr. Riley.

BY MR. RILEY:

Q MR. Carter, you've just testified that in regard to one plant, that underwater cement melting torch work had been considered and rejected.

A Let me clarify that if that was the impression you got.

I said in one plant we considered the flame cutting for a pool. That pool at the time would have been empty of fuel and no water.

Q And what plant was that, and what year?

A That was the Piqua nuclear power facility, and I'm relying on memory, but it was in the time frame

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1 of 1965.

2 Q What had been the history of the use of that fuel  
3 pool?

4 A That fuel pool had been in use for approximately  
5 two years.

6 Q Was the time of construction of that fuel pool  
7 essentially similar to that of the Oconee fuel pool in the  
8 sense of having a stainless steel liner and embedded plates  
9 in the wall, and so forth?

10 A It was not exactly the same. It was a reinforced  
11 concrete pool. That was one of the earliest plants. It did  
12 not use a stainless steel liner. It had an epoxy paint as  
13 a sealer on the pool.

14 Q Was there any evidence that the epoxy liner had  
15 been permeated?

16 A We had had leaks with that pool.

17 Q Would that not be a substantial difference with  
18 respect to a pool where there is a stainless steel liner  
19 which had retained its integrity and the cement had not  
20 become embedded with radioactive materials?

21 (Pause.)

22 A It could have been a difference in the sense that  
23 in one case you had a low-level radioactive water leaking  
24 from the pool with its radioactive particles.

25 In the other case you have a stainless steel

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liner which at times does leak slightly, and it's usually

Landor  
Bloom Fls.

2

collected in the space behind it, and it may or may not be

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drawn off.

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Q Do you know of your own knowledge that there is a drawoff provision in the Oconee fuel pool?

A I have not looked at that.

Q Let us hypothesize then that there is a drawoff provision in the Oconee fuel pool Number 3 and that it functions. This would mean that there was never any appreciable depth of wall wetted by radioactive liquid. Is that correct?

MR. KETCHEN: Mr. Chairman, I'm going to object to the question. This witness was put on for a limited purpose. As I said yesterday, I wanted to make sure that when one of the Staff witnesses answers a question and somebody else on the Staff knows an answer, under the obligation that the Staff has in reporting to the Board, we wanted to report the information we had. And that was the purpose of my coming forth and saying that we do have a person who has information on that.

He has given that information. There is no intent whatsoever to offer him as one who is prepared to discuss or go into all the if's, and's, and why's about Oconee on that. He was to report the information to the Board. He has done that. And I think to go into any line of questioning based on all sorts of hypotheticals is objectionable at this time.

CHAIRMAN MILLER: It is beyond the scope of direct



WRB/ab2

1 examination. The objection will be sustained. He was put on  
2 for a limited purpose, Mr. Riley.

3 MR. ROISMAN: Mr. Chairman, it seems to me he was  
4 put on for a much more generalized purpose, to try to  
5 rehabilitate a piece of testimony that was put in by other  
6 Staff members as to whether there's a basis for concluding  
7 that the breaching of a spent fuel pool wall is or is not a  
8 difficult task, or I think the testimony was "an impossible  
9 task."

10 As the record is left now, although I'm not con-  
11 vinced that this is all that persuasive, but at least it  
12 points in the direction of suggesting that there's some  
13 earlier experience in which doing some of the engineering  
14 things that might be done wasn't deemed to be feasible.

15 It this witness' testimony is allowed to stand and  
16 you can't ask the sort of questions that Mr. Riley is asking,  
17 then you're really insulating the Staff from exploring it.  
18 And consistent with Mr. Ketchen's well-stated principle that  
19 the Staff job is to get the record full, I think the record  
20 needs to know whether what happened at the other facility  
21 is really relevant to Oconee. And I thought that's what  
22 Mr. Riley was trying to find out.

23 MR. KETCHEN: I will agree with that statement  
24 of the premise but that's not where we're going now. Now  
25 we're asking hypotheticals. If he wants to ask about that

1 other situation that's fine, but now we're getting into some-  
2 thing else. I'm not sure this witness knows the answer.

3 CHAIRMAN MILLER: I think that's the basis on which  
4 we sustained the objection, that insofar as the witness has  
5 testified about the other situations at the other plants  
6 and insofar as that was referenced by Mr. Spitalny, and I  
7 believe it was, you may examine.

8 But we think that the purpose was more limited.  
9 The direct examination of the witness itself was limited.  
10 and you should stay within those bounds. He's not an all-  
11 purpose witness.

12 MR. RILEY: Mr. Chairman, I would request a re-  
13 consideration of your ruling. The basis is this:

14 The testimony that this witness has already given  
15 would sustain previous Staff testimony that torch cutting  
16 of a concrete fuel pool wall is not practicable for health  
17 reasons or emissions of dust.

18 What I'm trying to demonstrate is that the case  
19 there and the case here are really quite different.

20 CHAIRMAN MILLER: That may be, but this is the  
21 witness on the case there. That's all he has purported to  
22 know about. You can explore fully the case there, which is  
23 what he has covered, but --

24 MR. RILEY: I think I follow you, Mr. Chairman.

25 CHAIRMAN MILLER: Okay.

1 BY MR. RILEY:

2 Q One of the substantial considerations in the case  
3 that you've referred to is that there was contamination of  
4 the fuel pool concrete wall which seemed to make risky or  
5 infeasible, on the basis of the ignition considerations,  
6 cutting with a torch. Is that correct?

7 A Yes. Not only did we not cut with a torch, we did  
8 not cut with anything as it turned out.

9 Q All right. One moment, please.

10 (Pause.)

11 You are familiar with the fact of course that the  
12 Oconee pool has a different type of fuel pool construction,  
13 that the two cases are different?

14 A Yes, sir, I am aware of that.

15 Q In initially judging that -- and I'm referring to  
16 your testimony, Exhibit 18-A on page 2 -- that a 1-1/3 to  
17 1-2/3 core, full core reserve, whether it was a single or  
18 a dual-unit station, would be prudent, the Staff was making  
19 the judgment that to facilitate the continued operation of  
20 the plant in the most timely way, this would be a good step.  
21 Is that correct?

22 A I missed the last part of what you said.

23 Q I'm sorry.

24 A It was a word I missed.

25 Q I'm afraid I can't supply the word and you can't

WRB/ab5

1 supply it to me.

2 But you are saying that for a dual-unit facility,  
3 though you don't insist on it, it's prudent to have a 1-2/3  
4 core reserve because it will facilitate handling certain  
5 unanticipated events that would require reactor unloading  
6 for examination or repair or something like that. Is  
7 that correct?

8 A That's correct.

9 Q And would you feel it would be desirable for a  
10 plant to maintain that 1-2/3 or so full core reserve through-  
11 out its operating lifetime?

12 A Would it be prudent to do so?

13 Q Yes.

14 A I would say it would be prudent.

15 Q Right.

16 Now the frame of reference in which that ground-  
17 rule was originally laid was one in which reprocessing was  
18 envisaged for the nuclear generating industry. Is that  
19 correct?

20 A That's correct.

21 Q That situation has changed since 1977, has it not?

22 A It has.

23 Q However, it would still be prudent to maintain that  
24 1-2/3 full core reserve, would it not?

25 A Yes.

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WRN/ab6

Q It is conceivable that the means of maintaining a 1-2/3 core full reserve would have changed since 1977 because of a lack of reprocessing. Is that correct?

A You say the means of maintaining it?

Q That's correct.

A I'll have to explain what I understand your question to mean.

Q Would you like me to elaborate?

A If you would.

Q One of the things we talked about is increasing fuel pool capacity, and a number of means have been discussed. Poison racks are one. The possible extension of existing fuel pools is another. And an independent storage facility onsite is another. One in which modules are added economically is still another.

And my question is: Would you not consider it still prudent, by whatever means used, to maintain a convenient and accessible 1-2/3 full core reserve at a dual-unit plant?

A It would be prudent to maintain the full core reserve. The 1-2/3 was the pool size. You would only need a one core reserve for a dual unit.

Q I accept your amendment.

Now when I said "accessible," is it not more convenient in cases necessary to unload a reactor to have the

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1 reserve communicate directly to the fuel pool where the canal  
2 attaches to the reactor, connects to the reactor, then to an  
3 independent facility where the fuel assemblies would have to  
4 be placed in the cask, transported, et cetera?

5 A More accessible, yes.

6 Q So there would be a real advantage then in re-  
7 ducing outage time if, for the specific Oconee plant situa-  
8 tion on reactor 3, the fuel pool could be increased in  
9 capacity by an expandable modular addition. Is that correct?

10 A It would be more convenient. I think I need to  
11 add something that explains this a bit.

12 If the need to unload a core came up and the  
13 licensee decided, for whatever reason, it was to be unloaded  
14 now, obviously it is easier to unload into a convenient  
15 pool located adjacent, such as the original spent fuel storage  
16 pool.

17 However, on the other hand, if it was a planned  
18 discharge that he foresaw at perhaps a refueling some time  
19 off, fuel could be removed from that pool and then space made  
20 available. There is that added step, though.

21 Q All right.

22 Now then, in the event of an unanticipated need to  
23 remove the core from, say, Oconee Unit 1 or 2 at a time when  
24 the full core reserve would hypothetically exist in fuel pool  
25 3, would in terms of this morning's testimony, require

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1 something like 177 days, and the 177 days is approximately  
2 half a year.

3 And in terms of Table 10-A in the EIA the cost  
4 would be half of \$100 million, or \$50 million, so that the  
5 price tag in not having accessible directly a full core  
6 reserve is of the order of \$50 million. Is that essentially  
7 correct?

8 A It could be as much as that.

9 MR. RILEY: Thank you, Mr. Carter.

10 CHAIRMAN MILLER: Thank you, Mr. Riley.

11 MR. WILSON: Mr. Chairman, I have one question  
12 basically.

13 BY MR. WILSON:

14 Q Mr. Carter, in the discussion of the effort that  
15 you were involved in back around 1965, do you recall whether  
16 or not any consideration was given at that time to maintain-  
17 ing the seismic integrity of the pool that had already been  
18 in use?

19 A At the time we looked at Piqua it was for de-  
20 commissioning, and at that point it was no longer to be a  
21 reactor. No seismic consideration at that time.

22 I might also indicate that seismic consideration  
23 during the design was not a major issue then either.

24 Q Was I correct in understanding your earlier  
25 testimony when you indicated you had been involved in some

POOR ORIGINAL

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WRB/eb9

1 discussion on the Fitzpatrick reactor? Is that correct?

2 A I'm aware of those discussions that Fitzpatrick  
3 had with the Staff, yes.

4 Q Do you recall whether or not the seismic integrity  
5 was considered there or not?

6 A I don't remember. I have seen nothing that ex-  
7 plicitly states that. I would assume it was but I don't know  
8 it for a fact.

9 MR. WILSON: That's all I have, Mr. Chairman.  
10 Thank you.

11 CHAIRMAN MILLER: Thank you.

12 Mr. McGarry?

13 MR. MC GARRY: No questions, Mr. Chairman.

14 CHAIRMAN MILLER: Does the Staff have anything  
15 further?

16 MR. KETCHEEN: Mr. Chairman, that completes my  
17 questioning of Mr. Carter with respect to full core reserve  
18 and the other limited matter. So I would like to end that.

19 However, I would like to present Mr. Carter again  
20 before he leaves on another matter.

21 A long time ago, in June, the Board had a ques-  
22 tion and I'm trying to get Mr. Spitalny back in here to get  
23 the precision of the question, but I think it was Dr. Luebke  
24 had a question about poison racks, and Mr. Carter can  
25 respond to that question in a limited sense.

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1 I asked Mr. Spitalny through Mr. Carter to find  
2 someone on the Staff to report back information about the  
3 poison racks. There was, as you'll recall, a gas bubble  
4 problem, and there was some information requested on how  
5 many --

6 DR. LUEBKE: A deterioration.

7 MR. KETCHEN: What was the status of that.

8 DR. LUEBKE: Had it been solved.

9 MR. KETCHEN: Yes, had it been solved, and that  
10 sort of thing. Mr. Carter is not an expert in those areas  
11 but he can report to you what the status of that matter, so  
12 far as the Staff is concerned, is.

13 I know Mr. Carter can paraphrase the question  
14 because he's been primed to answer the question.

15 CHAIRMAN MILLER: You may tell us, Mr. Carter.

16 THE WITNESS: The problem that we allude to with  
17 the poison racks has been a gas generation within the storage  
18 cell. There are two general types of problems. One has  
19 been a radiation-induced problem. The other had nothing to  
20 do with radiation.

21 In the first case we had a boron carbide matrix,  
22 which is the poison, sandwiched between and within a stain-  
23 less steel sealed wall. The organic binder part of the boron  
24 carbide binder decomposed under irradiation. Hydrogen was  
25 given off. That hydrogen became the gas pressure which

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caused the stainless steel wall to bulge.

This was observed when fuel stored in cells with walls made up of this boron carbide material swelled inward and pinched the fuel assembly and removal became difficult. This was observed in the Haddam Neck facility in Connecticut.

Subsequent to that, we observed a gas swelling problem that was caused by Boral which is a boron aluminum matrix. In this case, the boron aluminum matrix was sandwiched between two plates of clean aluminum. There is a significance to the "clean."

Aluminum when in contact with water and not passivated will react with the water and give off hydrogen again. In this case, the aluminum had not been passivated; it was clean. The water leaked into this sealed area. Hydrogen was generated and it in turn caused the walls of the surrounding tube member to swell. Again, the fuel assembly was pinched.

The solution that has been used in both cases and accepted by the Staff has been to drill holes into the can containing the poison material to let the gases be vented. No pressure will build up; no bulging will occur.

Another solution that has been proposed by a utility and is under evaluation to date is to use higher quality fabrication techniques on the boron aluminum matrix material to assure that water does not get in. The belief

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**POOR ORIGINAL**

WRB/eb12

1 is that there will be only a few cases where water may get  
2 in and the swelling be observed, and those cases we have  
3 proven -- or it has been proven by the utilities that drill-  
4 ing will release the pressure.

5 That's the other approach.

6 That's about the substance of what I have. I'll  
7 be glad to try to answer any other questions you may have.

8 FURTHER DIRECT EXAMINATION

9 BY MR. KETCHEN:

10 Q If I may ask one question, that was about past  
11 history. If I may lead, it is my understanding that those  
12 racks are now-- It's not a matter of-- How about for  
13 future racks?

14 A This is history that I've mentioned. Proposals  
15 are in-house and have been approved since then where poison  
16 materials like that have been used and have been found  
17 acceptable. The proposal has been acceptable to the Staff  
18 and they are being installed.

19 Q You said something about boring holes. That had  
20 to do with past racks that are installed. How about the  
21 holes with respect to the Staff's approval of future racks  
22 with those kinds of poison in them?

23 A If there are holes in there to release the gas,  
24 the Staff has approved the proposal that way.

25 CHAIRMAN MILLER: And if there are no holes,

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1 then it's the other technique of a more refined type of  
2 manufacture. Was that the other?

3 THE WITNESS: Yes, that was the other one. It is  
4 the subject of a hearing in the Salem facility at the present  
5 time. The hearing has been terminated, I believe.

12.35  
6 DR. LOEBNER: Very good. Thank you.

7 CHAIRMAN MILLER: Thank you, sir.

8 Does any Counsel have any questions?

9 (No response.)

10 Thank you. The Board is satisfied with the in-  
11 formation and appreciates it.

12 MR. KETCHEN: We have nothing further of this  
13 witness.

14 CHAIRMAN MILLER: Very well.

15 (Witness excused.)

16 MR. KETCHEN: At this time, Mr. Chairman, we  
17 would like to call Mr. William McNeill to the witness stand  
18 to respond to a board question.

19 CHAIRMAN MILLER: Very well.

20 Whereupon,

21 WILLIAM M. MC NEILL

22 was called as a witness on behalf of the NRC Regulatory Staff  
23 and, having been first duly sworn, was examined and testified  
24 as follows:

25 MR. HOEPLING: Mr. Chairman, just to get us to

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where we are, on Tuesday, June 26th, the Staff witnesses were on the stand, testifying about the transportation impacts of cask shipment, and Mr. Wilson of the State of South Carolina posed some questions relative to cask inspections.

A point was reached in the transcript at page 1356 where the panel members could no longer respond with meaningful information, and the Staff indicated it would make a witness available to respond to that line of inquiry. And that is the function of Mr. McNeill.

## DIRECT EXAMINATION

BY MR. BOEFLING:

Q Will you state your full name and present position, please?

A My full name is William Michael McNeill. My present position is that of Contract Inspector for the United States Nuclear Regulatory Commission, Region IV Office.

Q And what do you do in that capacity?

A I'm a member of the Vendor Inspection Branch in Region IV, and in that capacity we inspect manufacturers of components for nuclear power plants.

Q Have you had an opportunity to inspect cask manufacturing operations?

A Yes. Part of my personal assignment is to inspect the cask manufacturing activities currently, that are currently underway.

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Q Are you familiar with the NRC's activities in this area, programs for these types of inspections?

A Yes. If you wish, I'll elaborate on the vendor inspection program.

Q Would you do that, please?

A All right.

12.270  
C10

Approximately five years ago the vendor inspection was formally developed. It provides direct and independent evaluation of manufacturers, particularly of their quality assurances program -- of not only manufacturers, but also architect-engineers and what we call NSSS or nuclear steam supply systems.

The assumption is a proper quality assurance program implemented, assures delivery of a safe component to the power plant.

Approximately in '74, very late in '74, the vendor inspection program was also charged with the responsibility to inspect cask manufacturing. Prior to that point, cask manufacturing had been inspected on a regional level, as opposed to being done by the vendor inspection branch.

The basis of the inspections that I and my compatriots do in Region IV is to assure that Appendix B of 10 CFR 50, in dealing with casks, Appendix E in the case of Part 71, as well as ASME Codes, American Society of Mechanical Engineers--the generic evaluation that we do of these

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wrb/agb2  
1 manufacturers. In the case of the cask manufacturers, we  
2 use Appendix E, we also use the SAR and the certificate of  
3 compliance.

4 MR. HOEFLING: Mr. Chairman, the witness would  
5 now be available for any questions that Mr. Wilson would  
6 like to follow up on.

7 CHAIRMAN MILLER: Mr. Wilson, if you wish to  
8 inquire along the lines you previously suggested, you may do  
9 so.

0 MR. WILSON: Thank you, Mr. Chairman.

1 CROSS-EXAMINATION

2 BY MR. WILSON:

3 Q Mr. McNeill, the certificate of compliance, the  
4 certificate which is issued on each cask, is this something  
5 that is processed through your office, is that correct?

6 A No, the certificates are not issued by my office.  
7 I receive certificates, of course, so that I can use them as  
8 an inspection basis.

9 Q So these, although they're not issued by you,  
10 you are involved in the actual, I guess, comparison of the  
11 certificate conditions and the cask itself for conformity,  
12 is that correct?

13 A Yes. As I've already stated, one of the bases  
14 for inspection is the certificate of compliance.

15 Q In the earlier testimony we had, there was some

wrb/agb3

1 indication which I'd like to get some clarification from you  
2 on, that when a cask was found to be out of compliance with  
3 its certificate that the owner or the lessee as the case may  
4 be of the particular cask certified corrections to the  
5 particular cask to the NRC.

6 Would that be your office that receives that  
7 owner or lessee certification?

8 A If I can qualify an answer before I say yes or  
9 no.

10 First off, we interface primarily with the  
11 manufacturer, not necessarily with the licensee. In some  
12 cases, a licensee may or may not be the manufacturer.

13 Q All right. That, I think, is getting to the core  
14 of my interest here in this particular aspect.

15 I understand, as I did earlier, that the parti-  
16 cular cask as it comes from the manufacturer before it goes  
17 in service does have to meet certain specifications.

18 Now is there an inspection that is done by you  
19 at that point before the cask goes into service, an actual  
20 physical inspection?

21 A Yes, there are inspections done. The inspections  
22 may or may not be for each individual cask at that particular  
23 time frame.

24 Q Will you explain the circumstances under which  
25 an actual inspection would not be required?

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A It's a matter of, just frankly, time frames. We try to inspect through the course of the manufacturing history a sample of events that have occurred. The testing which occurs at the generally terminal end of the manufacturing process is only one of the many things that we attempt to look at.

We may see the testing, we may not see the testing. We may review the records of the testing. We may review the records or procedures that are drafted before the testing.

Q There is, I take it, then, at least a possibility of a cask then going into service prior to your having examined those records, is that correct? It could go into service before you've examined the records?

A Yes. We work on a sampling basis.

Q All right.

So it is, then, not inconceivable that a defective cask could go into service prior to your having an opportunity to either see the records or otherwise become alerted to a problem, either through visual inspection or of the records?

A That remains a possibility.

Q All right, sir.

Let's move on, now, to the point at which a utility has a cask that has already received the certificate

**POOR ORIGINAL**

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wrg/agh5

of compliance and is in-service.

In particular, I would direct your attention to the Duke Power cask that had the extra shielding added. Are you familiar with that circumstance?

A I'm familiar with the circumstances, yes.

Q All right, sir.

And could you briefly relate to us the role which your branch would play or did play in the particular cask circumstances we've just identified?

A Backing up to previous testimony, the cask fabrication of that particular cask was prior to late-'74 and, in fact, it occurred throughout the period of '74, but I believe the ship date on that cask was -- it was postponed appreciably, all fabrication was done before December of '74. Consequently, my branch did not have any interface on that particular problem, it was handled by Region II.

Q The plating that was added on there, as I understand it, had to meet certain specifications which your division either through records or actual inspection would verify, is that correct?

A True.

Q And in the particular cases when you cannot get out and physically inspect the cask itself, what basis is your inspection on? Is that the records alone that are sent by the utility, is that correct?

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wrb/agb6

1           A       Again our inspections are done at the manufacturing  
2 facility, so there would not be records that would be sent by  
3 the licensee or utilities, keeping in mind that the licensee  
4 in this case may not be the utility. Particularly, in this  
5 case, the Nuclear Assurance Corporation of Atlanta, Georgia.

6           Q       All right.

7                   Now farther down the road when a cask, for what-  
8 ever reason, goes out of compliance, as soon as it is out  
9 of compliance with the conditions of its certificate it is,  
10 as I understand it -- and correct me if I'm wrong -- required  
11 to be taken out of service, is that correct?

12          A       Yes, and indeed, that's what occurred with this  
13 particular cask in mind.

14          Q       Right.

15                   The fact that it has been brought back into  
16 compliance, however, is verified in what manner?

17          A       It's kind of difficult to answer that, because  
18 we don't know exactly how that cask is going to be brought  
19 back into compliance.

20                   Presuming, if I may, what you're talking about  
21 is some sort of repair operation --

22          Q       Yes.

23          A       -- the cask would be returned to the fabricator's  
24 shop, and I would be there to inspect the repair operations  
25 that are occurring.

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wrb/agb

1 Q That wouldn't always be necessary, though, would  
2 it, that it be returned to the fabricator's shop?

3 A True.

4 Q In those instances, what verification is made to  
5 your branch of the satisfactory correction of the defect?

6 A The question that you pose, once you preclude  
7 repair, would be to what we call in Quality Assurance a  
8 disposition accept as is. That would be an activity that  
9 would be entirely between the transportation branch and the  
10 Licensee.

11 Q What was the disposition as is?

12 A Accept as is. In other words, presumably if you  
13 had a non-conforming condition and it did not have a con-  
14 sequence of safety -- maybe it cut some of the engineering  
15 safety factors or something like that or perhaps the cask  
16 could be returned to use but with limits on its use -- this  
17 would be something that would be done by the transportation  
18 branch and not by my branch.

19 Q All right, sir.

20 Is there any independent verification, aside  
21 from those instances which you related earlier where a cask  
22 actually has to be returned to the fabricator where you might  
23 become actually involved, is there any independent verifica-  
24 tion of what someone is telling your office, or the NRC  
25 generally, has been corrected?

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wrt/acb8

A Again if the correction is in terms of a repair that is done at a manufacturer's facility, I would inspect. If the correction is of the type where the hardware is physically not changed, perhaps limits are put on the usage of the hardware. That is handled between the Transportation Branch and the Licensee.

Q All right.

Now I'm going to try to get to the heart of this thing because I'm not quite to it yet.

If we have a situation where a cask, for instance, has a shielding defect, and if it were a defect which could be corrected by the individual operator who had the cask in possession at that time, short of sending it back to the fabricator, is there any independent verification device that is available to confirm that the repair has been made in a proper manner?

A If I understand you, Mr. Wilson, what you're saying is if the repair -- and I'm using the word "repair" intentionally -- is done by the Licensee, in that case, we would inspect the repair operation even if it was done by a Licensee.

Q If you could -- I think that's the answer I was looking for, but I would like if you could, please, to lay out for us the actual role that you do perform in inspecting these casks physically. Under what circumstances do you go out there

wrb/agb9

1 and look at them -- I believe now we've got when they're  
2 sent back to the fabricator and when the Licensee performs the  
3 repairs -- and when you do not. I'd like a comparison of those,  
4 please, if you could give us a general explanation.

5 A Part of Part 71 requires that a Licensee notify  
6 the NRC when he commences manufacturing activities on a cask.  
7 At that time --

8 Q Excuse me, before you go on. Manufacturing  
9 activity, does that include corrections to manufacturing  
10 aspects?

11 A I'm frankly not sure. I'd have to go back and  
12 question the people who wrote that part.

13 Q Well, is that really then applicable to what the  
14 scenario is that I just gave you?

15 A About the repair of the 1A cask?

16 Q Yes.

17 A I would suspect strongly there's enough attention  
18 on the repair of the 1A cask that notification will be made  
19 in any event.

20 Q I understand. But I'm looking at procedures and  
21 what is required from your standpoint.

22 A My inspector, as I indicated before, is a generic  
23 quality assurance program inspection. The repair or fabri-  
24 cation is going to take some time frame. I would set up a  
25 framework within that time frame to interrogate as many of the

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18 elements of Appendix E as I could.

Q All right. Now we're speaking generically there, is that right?

A Right.

Q All right.

Now in a specific instance what would be involved, when would you go out and actually see the cask, that's I guess what I'm asking, a particular cask.

A As I indicated before, working on a sampling basis, when you say a particular cask, a particular cask may not be subject to the sample.

Q But in the sample you're taking a generic approach, is that right?

A Right.

Q Is your division then limited to generic assessments?

A Yes.

Q All right.

So is there any other division within NRC which has responsibility for specific assessments?

A Specific assessments?

Q Of casks, that's what we're talking about, and inspecting the casks? A particular cask as opposed to a generic type.

A I would believe that would be the Transportation

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wrb/egb11

Branch.

MRS. WILSON: Might I inquire of the Staff at this point -- that is the aspect I was interested in getting on the record was the specifics, the generic is fine. But the next step is the specific aspects, and I wonder if we do have anybody who could briefly give us that?

MR. HOEFLING: Well I think there may be some semantic question here between generic and specific. This gentleman is the gentleman who conducts the field inspections of casks.

Now I think what he's saying is, in some cases he may not conduct any inspections and in some cases he may, we're operating on a sampling or an audit basis, and I think you may be confused by the use of the word "generic."

He is in a generic program, but he is also the individual that applies that generic program to the specific is my understanding, and he can correct me if I'm wrong.

DR. LUEBKE: As I was listening to the witness, I got the impression that he used the word -- he was inspecting QA programs an awful lot but he wasn't inspecting many casks, and he used the word "sampling" an awful lot. We're not talking about 1000 casks or 100 casks, we're just talking about seven or eight casks.

And I seriously question even that the concept of sampling belongs here, and I think Mr. Wilson is on the



1 track of something that should indeed be pursued.

2 BY MR. WILSON:

3 Q Can you tell us, Mr. McNeill, how many casks there  
4 are involved, do you know?

5 A Currently there are approximately 18 casks that  
6 have been manufactured and there are three in manufacturing.

7 Q That was my next question.

8 The manufacturers are spread where in the country,  
9 can you tell us this?

10 A Currently casks are being manufactured by  
11 EXELCO Development, Incorporated, Silver Creek, New York.  
12 There is also -- I stand corrected. I may have to say four  
13 casks are in manufacturing, three casks that could possibly  
14 be used for the United States that are being manufactured in  
15 Robutel, Ginnus, France, under license to Transnuclear,  
16 White Plains, New York.

17 Q How many manufacturers are there in the country  
18 at this time that you're responsible for running sample  
19 inspections or some kind of quality assurance investigation  
20 on?

21 A There are approximately, unless I forgot one,  
22 there are four people who have manufactured casks in this  
23 country.

24 Q I'm sorry, how many?

25 A Four manufacturers: Sterns-Rogers in Denver,

wrb/agbl3

Colorado; EXELCO Developments, as I mentioned earlier;  
NL Industries in Wilmington, Delaware and, as I mentioned  
earlier, Transnuclear in White Plains, New York.

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12 WRS/abl 1 Q I'm not being critical, but I'm having a little  
2 trouble understanding, with four manufacturers and, at the  
3 most, eighteen casks involved, what the difficulty would be  
4 in conducting the samplings that you go around doing. Could  
5 you give us some illumination in that regard?

6 A Yes. May I respond to Dr. Luebke at the same time?

7 When I say I look at quality assurance programs,  
8 sir, I do also look at the hardware. It is difficult to  
9 assess, for example, the control of special processes such as  
10 welding without looking at the welding of the casks them-  
11 selves. And, indeed, this has been done by myself, and others  
12 before me.

13 CHAIRMAN MILLER: All the casks?

14 THE WITNESS: Of all the casks. We've looked at  
15 the manufacturing of all the casks.

16 CHAIRMAN MILLER: All eighteen have been physically  
17 eyeball examined?

18 THE WITNESS: Yes, sir; all have been inspected  
19 at one point or another in manufacturing.

20 BY MR. WILSON:

21 Q Before they go into service?

22 A Before they go into service.

23 I apologize, Mr. Wilson: you took off in a direc-  
24 tion that led me to the position that you were going to ask  
25 me did we get to see the preoperational testing of all

WRB/wk2 1 eighteen casks. My answer to that has to be no; because we  
2 do not have, you know, manpower and things like that to  
3 witness preoperational testing that is done on all eighteen  
4 casks. We do it on a sampling basis.

10.250 5 I think now you can see why I used the term  
6 "sampling," sir.

7 CHAIRMAN MILLER: What is it that you sample?

8 THE WITNESS: We may sample welding, testing,  
9 procurement activities; how they handle non-conformances;  
10 how they handle corrective action and manufacturing errors;  
11 any one of those subjects; the design.

12 DR. LUEBKE: Do you depend on the vendor to do  
13 the complete inspection?

14 THE WITNESS: That is true.

15 We are on a third tier level here. We have the  
16 vendor who has to have a quality assurance program; and, indeed,  
17 that is what I'm looking at. The licensee also has to have a  
18 quality assurance program. My evaluation of the vendor is  
19 to double check on the evaluation also that is performed of  
20 the licensee, so that we measure the effectiveness of the  
21 licensee in controlling the manufacturing of the cask.

22 CHAIRMAN MILLER: Wait a minute. The effective-  
23 ness of the licensee in controlling the manufacture of the  
24 cask?

25 THE WITNESS: The licensee has the prime

WRB/wb3 1 responsibility here.

2 DR. LUEBKE: In the sense that he wrote the  
3 purchase order with some specifications, and he has to be  
4 sure he gets the product in accordance with what he wrote  
5 in the order?

6 THE WITNESS: Right.

7 He also has a certificate and a safety analysis  
8 report which he has submitted to the Commission.

9 CHAIRMAN MILLER: Yes. But what is his role  
10 vis-a-vis the manufacturer in the production as well as the  
11 testing and checking of this cask?

12 THE WITNESS: Part of Appendix E, which is  
13 applicable to the licensee is--

14 CHAIRMAN MILLER: Never mind that. What does  
15 he do? I'm trying to get the physical real world picture.

16 THE WITNESS: That's what I'm getting at.

17 CHAIRMAN MILLER: Good.

18 THE WITNESS: Part of it is for him to audit to  
19 assure that the manufacturing is done in accordance with his  
20 purchase order specifications and drawings, and things like  
21 that.

22 CHAIRMAN MILLER: How does he do that?

23 THE WITNESS: In the particular case of the cask  
24 in question here, an outside concern was hired by Nuclear  
25 Assurance Corporation, namely, U.S. Testing, of Hoboken,

WRB/wb4

1 New Jersey.

2 CHAIRMAN MILLER: What did he do?

3 THE WITNESS: They went in, witnessed welding,  
4 reviewed radiographs, witnessed testing; much the same sort  
5 of activity that I did; assured that procurement activities  
6 and materials received were proper and correct.

7 DR. LUEBKE: Who signs off?

8 THE WITNESS: I believe U.S. Testing did acknowledge  
9 a sign off. What you mean is, Who releases--

10 DR. LUEBKE: Who certifies that they did the  
11 work?

12 THE WITNESS: The manufacturer writes a release,  
13 and that release is acknowledged and countersigned, if I'm  
14 not mistaken, by U.S. Testing.

15 BY MR. WILSON:

16 Q Mr. McNeill, if I understand this correctly now,  
17 the process is, as the cask is manufactured, the manufacturer  
18 has to provide your department with certain records involved  
19 in its manufacture. That's one step; is that correct? On the  
20 manufacturing side that is its responsibility, at least as  
21 far as you're concerned; is that correct?

22 A Not necessarily provide the records; just make  
23 them available for review.

24 Q All right. That's fine.

25 The recipient of the cask, the licensee, they, if

673 092

WRB/wb5

1 I understand this correctly, must verify what the manufacturer  
2 has already stated or certified to be the cask's condition;  
3 is that correct?

4 A Yes.

5 Q And there may or may not, as I understand it, be  
6 a further verification by your division?

7 A That's right. That's why I say it is a third  
8 level verification.

9 Q Thank you. That's what I thought you meant  
10 before. And that's perfectly consistent.

11 Now what I'm looking at is, on the road, after  
12 someone has -- assuming it has been manufactured, the licensee  
13 has had it in service for some time, and, for some reason,  
14 the cask has gone out of compliance and requires some modifi-  
15 cation to its present condition, there, as I understand it, is  
16 no independent verification of what the licensee certifies  
17 as having been done; is that correct?

18 A I would say that's not correct, sir.

19 Q Would you explain where I am in error? Who does  
20 verify?

21 A Again, if there is a repair operation this would  
22 take it back into a manufacturing situation, and, again, I  
23 would verify in my inspection that the repair was done in ac-  
24 cordance with whatever was agreed to between the licensee and  
25 the Commission, that it was done in conformance with that.

673 093

WRB/wb6

1 Q Well I believe you earlier stated that in every  
2 instance where a licensee makes a modification to a cask  
3 you do inspect; is that correct?

4 A No; because not all-- Pardon me; but not all  
5 modifications to licenses would necessarily involve a manu-  
6 facturing type situation such as I pointed out before.  
7 You could modify your license by modifying the usage of the  
8 cask.

9 Q All right. I understand that.

10 Now what I'm thinking is, where you don't-- I'm  
11 back to the particular instance we talked about with the  
12 shielding again on the Duke Power cask. If you did not change  
13 the license features, and they did have a modification such as  
14 occurred in that instance, isn't it the policy of the NRC  
15 to have you, or someone from your division, go down and  
16 actually lay eyes on the thing and certify in some manner, or  
17 verify, if you will, the compliance with the regulations?

18 A Part of the problem with that particular cask is  
19 that it's a first time event that we have incurred. The cask  
20 is still out of use. The license has not been reinstated on  
21 it.

22 Your questions hinge around some policies that  
23 perhaps have not been really cast in stone so that I could  
24 say yes we would or no we wouldn't.

25 I'm sorry if I can't give you further information



WRB/wb7

beyond that.

Q I understand.

So to the best of your knowledge at this point there could or could not -- you really cannot tell us, if I'm correct, to the best of your knowledge whether or not there indeed is any verification of those kinds of situations; is that correct?

A As I said just a second ago, we're dealing with a one-only situation right now.

Q Well assume for an instant that that's aside, that we today find the cask in the same condition as the one we have just set aside. Now under present circumstances what verification is there to the certification by the licensee that he has made the modifications in compliance with the regulations? What verification is there?

Do you see where I'm going? I'm trying to get some certain verification.

DR. LUEBKE: If I may interrupt.

I think Mr. Wilson is asking, Is there a regulation or a procedure that you're going to use when you finish this one of a kind thing you're in the middle of.

MR. WILSON: That's correct, Dr. Luebke. Thank you.

DR. LUEBKE: And what is that procedure? And we are disturbed that there doesn't seem to be one.

673 095

WRB/wds

1 CHAIRMAN MILLER: Well there isn't one, really,  
2 is there, at the present time? Isn't that the situation?

3 THE WITNESS: I'm afraid I'm going to have to  
4 answer that question that I really don't know.

5 CHAIRMAN MILLER: That's all right. We're  
6 just trying to find out.

7 BY MR. WILSON:

8 Q This is my problem. Who would know? How can we  
9 find an answer to that question? Do you know?

10 A I will have to defer to counsel on that.

11 CHAIRMAN MILLER: Mr. McNeill, I take it it is  
12 not within the area of your knowledge or perception at the  
13 present time. We don't want to get you beyond what you know.

14 THE WITNESS: My bailiwick is the manufacturing  
15 of casks and making sure that they're manufactured within  
16 the conformance with the certificate, the license documents,  
17 the SAR. And you're questioning is getting beyond that  
18 area. And I answered it in terms of repair because that  
19 would come back into my bailiwick. We're dealing with a  
20 one of a kind situation. I don't know where we have an answer.

21 CHAIRMAN MILLER: Mr. McNeill, I gather, I infer  
22 from your testimony that you're a generic cask-checker; is  
23 that right?

24 THE WITNESS: Right.

25 CHAIRMAN MILLER: And we seek to get you beyond

WRE/wbS

1 that. And, of course, you don't have the knowledge. So we  
2 just want to know what you do know, and when we get beyond where  
3 your experience and duties take us, just tell us.

4 Is there anything further you can add to what  
5 you do besides what you've described?

6 THE WITNESS: No, sir.

7 DR. LUEBKE: I think I would comment at this time  
8 that this sort of verifies what I think they were worried  
9 about in this GAO report that was published last May.

10 The other thing I would like to pursue is that  
11 there's a little gap between chairs here as to where the DOT  
12 inspection and verification takes over from the NRC. And  
13 that ought to be clarified.

14 Now is that a difficult problem to get a handle on?  
15 Do we talk with the DOT?

16 CHAIRMAN MILLER: Do you need time to ascertain  
17 this?

18 MR. HOEFLING: I don't know the answer to the  
19 question, Mr. Chairman, as to, you know, what the DOT does in  
20 this area. I suspect they don't do anything in the area of  
21 cask manufacturing type of inspections.

22 DR. LUEBKE: Mr. McNeill sort of identified a  
23 place where the bridge was being crossed. I don't remember  
24 the details, but maybe he could help us.

25 Where is this place where things get to the DOT?

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WRB/wb10

1 It's to do between manufacturing and repairs someplace, and  
2 where it is repaired that it gets to DOT, isn't it?

3 THE WITNESS: To the best of my knowledge, sir,  
4 this morning -- or this afternoon I haven't used the initials  
5 DOT.

6 CHAIRMAN MILLER: I think we misunderstood you.  
7 Is there any other agency that you were referring to, federal  
8 agency?

9 THE WITNESS: The Transportation Branch?

10 CHAIRMAN MILLER: Yes.

11 DR. LUEBKE: Oh, of the NRC. I see. I mis-  
12 interpreted that.

13 THE WITNESS: That was in response to Mr. Wilson's  
14 question.

15 When one makes a license modification that did  
16 not involve a repair, you know, who would be involved in  
17 that; and it's the Transportation Branch.

18 CHAIRMAN MILLER: Thank you, sir.

19 Any further questions?

20 MR. WILSON: Just a couple of more, Mr. Chairman.

21 BY MR. WILSON:

22 Q Mr. McNeill, assuming that a cask is manufactured,  
23 say in 1974, and is issued a certificate of compliance and  
24 goes in service, does NRC ever go back and inspect for  
25 compliance, for continued compliance with that?

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WPB/vdb:1

A Again, that would be outside of my bailiwick, sir. Because the cask would not be in the manufacturing facility, I presume from your question.

Q Do you know whether or not the NRC has a field team to go out and do the inspection in such a manner as I say, just spot verification, or sample verification on a specific basis, as opposed to the generic which you do?

A On a specific basis we have gone back and, indeed, on the LA cask that you're referring to, with the repair, have measured that cask. And I indeed participated in measurements of some similar casks.

Q So your earlier statement that this was out of your bailiwick then is not quite correct; am I right in that?

A No. It was at a specific request that I go witness the dimensional measurements that were made.

Q All right. Aside from that specific request, I mean had that not been received who else in NRC would have done it? Do you know if anyone else has that kind of responsibility?

A No, sir.

Q You do not know or they do not?

A I do not know.

Q All right, sir.

In the particular instance that you just related when you did have a specific request, who was that received

WRB/WBL2

from? Can you tell us that?

A The Transportation Branch, Mr. Cunningham.

MR. WILSON: Mr. Chairman, I believe we're at the end of what this witness can provide us with at this point. I'm afraid I still haven't obtained the assurances I was seeking when we started here. And I would again ask the Staff if we might have some clarification in the area from someone. If it is not Mr. McNeill, perhaps we can gain it from Mr. Spitalny or some other individual who is associated with these things. Because these are areas that do impact on the public health and safety.

CHAIRMAN MILLER: We appreciate your concern. We'll see about getting some information.

We also appreciate Mr. McNeill. He has very candidly told us where his area of knowledge is and where it isn't. That's exactly what we want of the witness.

DR. LUEBKE: In earlier testimony I think I heard about casks which were intended to have a 10 Kw heat dissipation and came out with maybe a 3 Kw heat dissipation. That would show up in a preoperational test perhaps. Is that within your area of interest and responsibility?

THE WITNESS: Perhaps you could straighten me out a little bit.

DR. LUEBKE: If the deficiency were 10 percent, that would be one thing. That the deficiency is a factor of 5

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is remarkable and means that somebody has made a slide rule error of some consequence.

What happens in these cases, and how does it happen? I mean, do you witness this in your work?

THE WITNESS: Again, through the quality assurance requirements, the tests would be done, of course, by the manufacturer. He would be identifying this problem first.

The licensee is also required to have a quality assurance program which would include things such as surveillance, having a gentleman from U.S. Testing perhaps witness the testing. That brings the identification of the problem within the licensee's bailiwick. I may or may not be there and see the same consequences of the test.

Some of the things I would look for would be to see that indeed the test results were documented, the extent of the non-conformity which was identified, that it was properly bumped up the chain, the manufacturer to the licensee, and the licensee on to the--

DR. LUEBKE: Someplace somebody says "No." Where does the buck stop?

THE WITNESS: Unacceptable, or whatever they do with it.

DR. LUEBKE: You're suggesting it's negotiable?

THE WITNESS: Not necessarily. I would presume with that sort of difference you put it on a back shelf and

WRB/vbl4

start again.

1 DR. LUEBKE: I had the impression from the earlier  
2 testimony that there were some motions in the direction of --  
3 what do you call it? reducing the capability or the operating  
4 use of the cask.

5 WITNESS SPITALNY: Reducing the thermal heat  
6 load.

7 DR. LUEBKE: Yes. In other words, it'll be  
8 accepted conditionally.

9 WITNESS SPITALNY: That's correct.

10 DR. LUEBKE: That's what I mean by negotiated.

11 CHAIRMAN MILLER: Is there a situation where you  
12 can either adjust the qualities or qualifications of the  
13 cask or you can leave the qualifications of the cask as-is  
14 and adjust the requirements of the rule, or the criterion  
15 that you're using? I guess those are the two methods, aren't  
16 they, that you alluded to?

17 THE WITNESS: I quality assurance work we talk  
18 about a number of different types of dispositions to a  
19 non-conformity. One is to repair it, or rework it; disposition,  
20 accept as it; or a conditional acceptance.

21 CHAIRMAN MILLER: The condition is lowering the  
22 standard by which it was originally tested or checked.

23 DR. LUEBKE: At what point do you tell the man  
24 to go back and redesign it and rebuild it? Had it been 1 Kw?  
25



WRB/wb15

THE WITNESS: To correct you, sir, I would not tell him.

DR. LUEBKE: You wouldn't?

THE WITNESS: No, sir.

DR. LUEBKE: Someone else does?

THE WITNESS: in a sense I would force the conclusion upon himself.

DR. LUEBKE: Somebody makes a decision.

THE WITNESS: Yes. The manufacturer at that time.

DR. LUEBKE: He has to admit that he has a faulty product?

THE WITNESS: It would have to be the manufacturer at that time, keeping in mind that the title of the cask is in the manufacturer.

DR. LUEBKE: All right. Thank you.

CHAIRMAN MILLER: Any further questions?

MR. HOEPLING: Mr. Chairman, I have a few redirect questions, and I think Mr. Riley has some questions also.

CHAIRMAN MILLER: Mr. Riley.

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CHAIRMAN MILLER: We'll take our afternoon recess now, about 10 minutes.

(Recess.)

CHAIRMAN MILLER: We'll be back on the record.

Mr. Riley?

BY MR. RILEY:

Q Mr. McNeill, you define as working on a sampling basis that is subject to a quantitative translation compared to 100 percent inspection. Could you relate your sampling basis to 100 percent inspection?

A It is not possible to relate in the area of auditing, quality assurance auditing on that parameter that way. It may be done when one is sampling parts, hardware, so many bolts out of the whole population, but when you're on an auditing basis, it cannot be done.

Q Let us assume that the manufacturing time for one of the casks in question is 10,000 hours. How much auditing time could be assigned to that one cask?

A That depends upon the manpower availability at the time.

Q I realize, but what we would like is a sense of quantitatively --

A May I --

Q May I continue the question? We would like an indication quantitatively of how much effort your department

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wrb/sgl

is able to bring to bear upon its mission. In other words, are you understaffed, overstaffed, adequately staffed?

A Could I answer that by pointing out that, for example, recently as EXELCO manufacturing has been in the process of manufacturing one cask, we have spent four man-weeks at the manufacturing facility. That's consistent with the manufacturing cycle that occurred relatively recently at the National Lab -- the NL Industries.

Q Can we use 160 hours as equivalent to four man-weeks?

A Say that again?

Q May I use 160 man-hours as equivalent to four man-weeks?

A Certainly.

Q All right.

Now what is the actual number of man-hours for one of those EXELCO casks, manufacturing time?

A Not being the manufacturer, sir, I cannot answer that question.

Q Do you have an order of magnitude as to it?

A No, sir, because the manufacturing has been a rather disjointed stop-start effort.

Q Are you aware of the selling price to an Applicant of an NAC-1 cask, the current value?

A No, sir.

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wrb/agb3

Q You have not heard that it's of the order of a quarter of a million dollars?

MR. MC GAREY: I want to object to the line of questioning, the cost of the cask, I don't think, is within the --

MR. RILEY: What I'm trying to get is a labor figure here. If we subtract the material cost and the profit cost, we can get a labor figure and an idea of how many man-hours went into it.

CHAIRMAN MILLER: It may be difficult, but we'll let you try.

BY MR. RILEY:

Q Let's hypothetically say that --

CHAIRMAN MILLER: A hypothetical isn't going to help us so much. Can't you see if you can get a little bit more from -- an estimate, at least, from the witness?

MR. RILEY: We have in the record that it is about a quarter of a million dollars.

CHAIRMAN MILLER: Where do you go from there?

BY MR. RILEY:

Q Have you an idea of what the profit margin involved is? --

A No, sir.

Q There are six NAC-1 casks that have emerged and have been in service, is that correct?

wrb/agb6

1 A There are six of that type cask in service  
2 currently.

3 Q Right.

4 A Pending the order to --

5 Q But momentarily grounded?

6 A True.

7 Q Now you pointed out that one defective cask was  
8 made prior to late-1974.

9 A That's true.

10 Q When was it first determined that it was defective?

11 A It had been determined during the manufacturing  
12 process. The problem that the 1A cask has, as I perceive it  
13 and understand the problem, there was an apparent void in the  
14 lead, when the lead was poured in the annulus between the  
15 inner shell and the outer shell of the cask.

16 There was some repair that was done at the time,  
17 a repair that was sanctioned by both manufacturer and the  
18 Licensee, and that was to add additional copper plates to  
19 make up for the deficiency in the shielding.

20 Q Where were the copper plates added?

21 A On the outer shell, sir.

22 Q On the neutron shield, the outer shell?

23 A I'm referring to the outer shell of the cask,  
24 not the outer shell of the neutron shield.

25 Q Which means that the neutron shield was thinner

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wrb/agh5

in that region? The neutron shield is a 4.5 inch gap that contains borated anti-freeze solution.

A To the extent that the width of the copper plates -- which I'm not sure what the width was, I'm sure it was approximately 3/4 of an inch or less.

Q The cask was placed in service, yet within the last year it was withdrawn from service. What was the basis for withdrawing it from service?

A The basis for withdrawal of that particular cask was twofold, in my understanding. But I would think that it would be best to put that question to the Transportation Branch people who did the withdrawal from service.

Q In your judgment, can you say that the process as it was in place prior to late-1974 worked, if it did indeed permit not one but three casks to go into use without meeting the functional compliance standard?

3.080 A Which process are you talking about, the inspection process of the NRC?

19 Q That is right, the inspection process.

20 In other words, regulation, in a broad sense.

21 A Would you rephrase your question again, please?  
22 It was rather long.

23 Q Can we conclude that the inspection process or  
24 regulation failed vis-a-vis the operation of three non-  
25 compliance casks being permitted to occur over a period of

wrb? gbs

something like four years?

A I would not conclude that, sir.

Q Would you give your reasons, sir?

A Namely, as I've already identified, that the non-conformance that you're talking about when a cask was identified at the time of manufacture, it was handled as a non-conformance by the manufacturer which shows that the quality assurance program that is required by Appendix E, that was required by the SAR, was indeed in place and being implemented by the manufacturer.

Q That cask has subsequently been declared, in effect, out of compliance with the functional requirements of the certification, is that correct?

A You say functional requirements of the certification. I would like you to clarify.

Q Yes. There are certain requirements with respect to uniformity of radiation field specifying a given source. There are dimensional requirements with respect to freedom from interference on insertion of the charge which is a defined mass and that sort of thing.

A Given that I understand that the casks are, you know, they have been pulled out of service because of failure to comply with the certificate, yes.

Q We can say then that the cask was used for four years in a condition of not complying with the certificate?

wrb/agh/

MR. MC GARRY: I object to that question.

CHAIRMAN MILLER: Let me inquire, was the cask subsequently pulled out for non-compliance in use for four years?

THE WITNESS: I can't really address the use of the cask.

CHAIRMAN MILLER: What do you use a cask of this kind for, what's its purpose, what's its function?

THE WITNESS: It's to ship spent fuel, sir.

CHAIRMAN MILLER: Was it used to ship spent fuel during some portion of the four years prior to its being taken out of service?

THE WITNESS: I understand it has, but I really am not the best person to ask about the use of the cask.

CHAIRMAN MILLER: You're the only one we have. Such as you are, we must do with you.

Go ahead.

BY MR. RILEY:

Q Can you say in view of the fact that the cask which was not in compliance and was used four years represented satisfactory operation of the regulation process, as intended?

MR. MC GARRY: Mr. Chairman, let me just note again my objection. The question is premised upon the fact that from the date that the cask went into service that it



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was defective and had then been used for four years in a defective state. That has not been established, so I think the premise of the question is fallacious.

CHAIRMAN MILLER: The witness can indicate whether that's a fact, whether it's something he doesn't know or whether he knows it isn't so, we'll just let the witness give us the facts as he knows them on that score.

THE WITNESS: Let me answer the question then this way: the four-year time period that the cask was in use, presumably in use, it was not acknowledged by the Licensee that it was in a non-conforming condition.

The problem is that the repair that was done is different from the certificate, particularly different from the drawings referenced on the certificate. And the problem that we have here is we have a repair condition that brought the cask out of the certificate condition, that it didn't look like the drawing after they put the copper plates on.

However, the Licensee did not identify this to the Commission, he did not see the need to. He did not understand that he was in non-compliance with the conditions, as I understand the situation.

BY MR. RILEY:

Q As the Licensee then is a link in the regulatory process -- and this would be in accord, I assume, with the regulations -- can you not say that the regulatory process in

WRD/agb9

1 this instance failed?

2 A Again I'd say no, sir, because you know the  
3 conditions were being handled in accordance with the program  
4 that had been established.

5 CHAIRMAN MILLER: We think that's about as far  
6 as you could go without getting argumentative. The facts,  
7 I think, are clear of record.

8 BY MR. RILEY:

9 Q Is part of the final inspection process which  
10 you attested to in an example you gave by U.S. testing,  
11 et cetera, is part of it concerned with the dimensional  
12 compliance of the interior of the cask, the inner chamber  
13 which I think is of 1/2-inch or 5/8-inch steel, that those  
14 dimensions comply with the drawings?

15 A Yes. It is not done necessarily at the final  
16 manufacturing process, because that dimension is determined  
17 long before that.

18 Q But there would be a date of end of process  
19 established?

20 A Yes, sir.

21 Q Is it true that among these three casks now  
22 found in non-compliance, that a problem was encountered in  
23 inserting the load, the basket into the cask?

24 A I'm not aware of any problems of insertion of  
25 the fuel bundles into the cask.

wrb/agb

Q Are you familiar with the problems encountered with one of these casks in the LaCrosse Nuclear Station?

A No, sir.

Q I have here a document which is entitled, "Investigative Report Concerning Shipment of Radioactive Material by Darien Power Cooperative, Genoa, Wisconsin."

I will show you this document and ask you if you are familiar with it.

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WRB3a2 ebl

1 CHAIRMAN MILLER: Has that been identified as an  
2 exhibit?

3 MR. RILEY: That will have to be identified as  
4 CESC Number 9.

5 CHAIRMAN MILLER: All right. Let's have it marked  
6 then.

7 (Whereupon, the document  
8 referred to was marked  
9 as CESC Exhibit 9  
10 for identification.)

11 CHAIRMAN MILLER: Describe it for the record so we  
12 know what you're talking about.

13 MR. HOEFLING: Mr. Chairman, I would object at  
14 this point to Mr. Riley's effort to have the witness become  
15 familiar with this document. The witness has indicated he  
16 is not familiar with it, and I don't really know what pur-  
17 pose would be served by having him become familiar with it  
18 since his reason for being here is to testify to the  
19 Commission's program in the area of cask inspection.

20 CHAIRMAN MILLER: I haven't heard him say whether  
21 he's familiar with it or not. We've just had it marked for  
22 identification. We don't even know what it is, so we'll  
23 let him go forward, at least to that extent.

24 You may answer. Are you familiar with the document?

25 THE WITNESS: No, sir. I thought I had answered

WRB/eb2  
1 that question before.

2 CHAIRMAN MILLER: I'm sorry, if you did I didn't  
3 hear you.

4 MR. ROISMAN: No, he did not, Mr. Chairman. He  
5 said he was not familiar with some incident. The document  
6 and the incident have not necessarily been related by any-  
7 one.

8 CHAIRMAN MILLER: That was my recollection, but I  
9 could have been wrong.

10 At any rate, take a look at the document which has  
11 now been identified as CESH Exhibit Number 9. You look at it.

12 Let me have a copy of it. Do you only have one?

13 I want to have it described for the record so I  
14 know what Exhibit 9 is, first of all.

15 THE WITNESS: The document is entitled "Investi-  
16 gative Report Concerning Shipment of Radioactive Material  
17 by Darien Power Cooperative." There is no date on it. And  
18 it has an addenda on the last two pages that compares three  
19 pages, a total of five pages.

20 CHAIRMAN MILLER: Thank you.

21 Now have you seen that document before or can you  
22 identify it, sir?

23 THE WITNESS: No, sir, I've not seen that document  
24 before.

25 CHAIRMAN MILLER: Now then, let me inquire:

WRB/eb3

1                   What's the nature of the document and what is its  
2 relationship to your interrogation of the witness?

3                   MR. RILEY: It is an inspection report which is  
4 an attachment to a Nuclear Regulatory Commission document  
5 which I now would like to introduce into the record, and I  
6 will identify it as CESC Number 10.

7                   CHAIRMAN MILLER: And what is CESC Number 10 for  
8 identification?

9                   MR. RILEY: It is titled "U. S. Nuclear Regulatory  
10 Commission - Office of Inspection and Enforcement - Region  
11 Number III - Report Number 50-409/79-06 - Docket Number  
12 50-409 - License Number DPR-45 - Licensee: Darien Power  
13 Cooperative, 2650 East Avenue, South LaCrosse, Wisconsin."  
14 And the title, under "Further Information" on the document,  
15 which is signed by Inspector Ridgeway and approved by R. F.  
16 Warnock, Chief for Reactor Project Section Number 2, dated  
17 April 20, 1979, is "Inspection Summary."

18                   And it is my understanding that the document that  
19 I introduced as CESC Number 9 is that investigative report.

20                   CHAIRMAN MILLER: And what does that have to do  
21 with this witness' interrogation?

22                   MR. RILEY: It has to do with inspections of this  
23 type of cask, presumably one of the three defective ones in  
24 which it was found there were dimensional non-conformities  
25 or irregularities inside the cask. And it relates of course

WRB/eb/

to my line of questioning about how the dimensional integrity of the cask is evaluated and confirmed.

CHAIRMAN MILLER: Well, we'll have to find out if this witness has any knowledge.

(Whereupon, the document referred to was marked as CESG Exhibit 10 for identification.)

CHAIRMAN MILLER: What was your objection, Mr. Hoefling?

MR. HOEFLING: I'm objecting that the witness is unfamiliar with the documents, and that this inquiry is not related to his purpose in being here, which is to describe the types of activities related to cask inspection which the Commission conducts.

CHAIRMAN MILLER: You may inquire, Mr. Riley, to what extent it is within this witness' knowledge, responsibility and the like insofar as the dimensional problem concerned, or matters of that kind. We'll find out first what the state of the witness' knowledge is, before you go too deeply into it.

You may ask.

BY MR. RILEY:

Q Are you familiar with the content of either CESG Number 9 or Number 10?

WRE, ab5

A No, sir.

MR. RILEY: I don't think we can proceed then,  
Mr. Chairman.

CHAIRMAN MILLER: Apparently not. He apparently  
doesn't have the information that you seek.

BY MR. RILEY:

Q Mr. McNeill, in terms of your job function in the  
Nuclear Regulatory Commission, would one not expect that you  
would be familiar with such material in the normal course of  
your work, communication about a cask problem, the same type  
of cask at another facility?

A Sir, did I do not -- or have no awareness of the  
contents of those reports, I cannot answer that question  
again.

Q Would it help you to again inspect CESC Number 10  
to decide if it is a valid agency document?

CHAIRMAN MILLER: Yes, you may show it to the  
witness.

Mr. McNeill, you may examine these exhibits and  
satisfy yourself as to what they are at any rate, and let  
us know whether or not it's within the scope of any of your  
responsibilities, knowledge, information, and the like. We'll  
leave it to your judgment, but we want you to tell us how  
it fits, if it does fit, within your own area of either  
responsibility or information that one could reasonably



WRE/eb6

expect you to have.

THE WITNESS: Would you like to take a break here?

CHAIRMAN MILLER: Yes. How about ten minutes,

or five?

THE WITNESS: Preferably ten, sir.

CHAIRMAN MILLER: All right.

(Recess.)

25

CHAIRMAN MILLER: On the record.

MR. ROISMAN: Mr. Chairman, we have discussed the question of the motions to strike. As I understand it, Mr. McGarry and Mr. Ketchen are amenable to the process by which I will file within a week the motions to strike that I would have otherwise presented orally here based upon whatever the same legal standard would have been if you had not ruled on the admissibility of -- otherwise ruled on the admissibility of the evidence. They will respond under the rules for response to motions, whatever those times are that are specified in the rules. And that will be the end of it, unless I make a request which you would then have to rule on under the rules for an opportunity to reply.

CHAIRMAN MILLER: All right. We'll construe that to be a stipulation.

Is that agreed to by all counsel?

MR. MC GARRY: Yes, sir.

CHAIRMAN MILLER: It will be so indicated in the record.

What's next.

MR. KETCHEN: Maybe we should hear from Mr. Riley on a similar request he may have.

CHAIRMAN MILLER: Mr. Riley.

MR. RILEY: At this time I'm not in a position to make a similar request. Might I reserve the right to use a

WRB/wb:  
corresponding procedure if, on re-examining the transcript,  
which I do not have, I find myself in a similar position to  
Mr. Roisman?

CHAIRMAN MILLER: Yes. In other words, you will  
make whatever motions you deem appropriate, and counsel will  
have the time provided by the rules, and you wish to respond  
appropriately; is that what you have in mind?

MR. RILEY: Yes.

MR. KETCHEN: I have one reservation. With  
Mr. Roisman I had the sense that this would happen within a  
week and then we would respond very promptly. I would like  
maybe the same indication from Mr. Riley.

CHAIRMAN MILLER: Well I think we'll do it; except  
we've got to be fair. Now we are loaning a copy of the  
transcript, one of the Board members, to Mr. Roisman, which  
I think necessarily is a cogent part of his week. Now are  
you going to make available for the use of Mr. Riley one  
set of the transcripts? If so, we'll have the same rule.  
If not, we'll have to think about it.

We sacrificed. Now let's see if the Staff is  
prepared to sacrifice.

If counsel can provide copies of the transcript  
we will ask Mr. Riley to observe the same time period, one  
week from the time he receives the copies of the transcript.

MR. KETCHEN: I'm hesitating because it's really

WRB/wc3

an imposition. There is the Public Document Room available here in Charlotte and elsewhere.

I would agree to submit copies of the transcript which deal with the material that has not been admitted into evidence, which is basically Staff -- the part of the hearing covering the exhibits after Staff Exhibit No. 12, I believe. And that would-- And if that's agreeable I could do that.

MR. RILEY: I would have no problem on that.

CHAIRMAN MILLER: All right.

MR. KETCHEN: We, of course, would regard this as a loan. We would like to get them back.

CHAIRMAN MILLER: In that event the Staff will make the transcript described, Mr. Riley says that will be agreeable to him. We will therefore give Mr. Riley the same opportunity, and ask that he file within one week of the time he receives the copies.

Agreed?

MR. RILEY: Yes.

CHAIRMAN MILLER: It is so stipulated.

Anything else?

Are we through with the witness, now?

MR. RILEY: No.

CHAIRMAN MILLER: He doesn't have to sit here if you don't have any more questions for him.

MR. RILEY: No, sir.

WRB/wb4

1 THE WITNESS: I thought I had a little task before  
2 I left.

3 CHAIRMAN MILLER: You were reading something,  
4 weren't you?

5 THE WITNESS: Yes.

6 CHAIRMAN MILLER: All right. Proceed.

7 BY MR. RILEY:

8 Q Mr. McNeill, normally in the course of your work  
9 would such documents cross your desk?

10 A No, sir. I see no need to.

11 With the Chairman's permission, may I describe  
12 the documents and elaborate on their content?

13 CHAIRMAN MILLER: Well, first of all describe  
14 them. And, since you don't see them, let's find out what  
15 you know about their contents. Give us a description.  
16 Yes, we'd like that for the record.

17 THE WITNESS: CESH No. 10 is what we call a  
18 standard inspection report. CESH No. 9 is an investigative  
19 report to an allegation. They are indeed redundant. And,  
20 indeed, one was the attachment to the report. The investiga-  
21 tive report was probably an attachment. It is not an uncommon  
22 practice in our office file system.

23 The report, I would like to point out, since it  
24 involves a concern that the State had, is an inspection of,  
25 if I can read the summary--

WRB/vms

CHAIRMAN MILLER: Well, do you know anything about this, or does it come within the scope of your responsibilities?

THE WITNESS: May I elaborate just a little bit?

CHAIRMAN MILLER: Yes. But I don't want to get into it unless you're going to go all the way. Don't dip your toe in it and then have to pull back when we start asking you questions. That's what I'm really trying to find out.

THE WITNESS: One of the concerns the State had was, what happens after my inspections at the fabricators.

CHAIRMAN MILLER: You're getting warm. Go ahead.

THE WITNESS: This inspection report is an example of what happens afterwards. We do indeed have people who go out and inspect the use of the casks.

CHAIRMAN MILLER: You may tell Mr. Riley about it. We think he's entitled to know. Go ahead.

1 WITNESS MC NEILL: This is indeed what this report  
2 is about. It is a report about the inspection of the use of  
3 the cask at Dairyland Power Cooperative, LaCrosse reactor site.

4 The dimensional problem you're referring to was  
5 that the canisters which are used inside the cask, which are  
6 outside, generally, the scope of the cask manufacturers, by  
7 the way, were too big. And, as pointed out in the investiga-  
8 tive report, that's hardly a safety-significant item, when  
9 you can't put the lid on.

10 Now, on the basis of the conclusion of the report,  
11 I see no need why I would ever have to be aware of the  
12 report. It would be totally useless information.

13 BY MR. RILEY:

14 Q Now, Mr. McNeill, in one instance the basket was  
15 too long, and in the other the interior of the cask did not  
16 permit unhindered insertion of the basket?

17 A No, sir. They're talking about insertion of the  
18 fuel assemblies into the basket.

19 CHAIRMAN MILLER: Refer to the portion that Mr.  
20 Riley is asking about.

21 THE WITNESS: The basket in the NAC-1D was  
22 pushed to one side, or bowed slightly.

23 May I go back to the beginning of that sentence?

24 "The basket." It's not referring to the interior  
25 of the cask, sir. That is the portion that you're talking

wal 2

1 about, right?

2 BY MR. RILEY:

3 Q That is the portion I'm talking about.

4 Is there some means of interoffice communication  
5 whereby there would come to your attention the facts that did  
6 bear on the cask, as distinguished from the basket?

7 A Yes, sir.

8 Q Are you familiar, then, with the deficiencies in  
9 the other two NAC-1 casks?

10 A Yes, I am aware of some deficiencies that are  
11 still under review, and I don't think it's appropriate to  
12 refer to them necessarily as deficiencies.

13 CHAIRMAN MILLER: How would you characterize them?

14 THE WITNESS: They're discrepancies from the  
15 drawing at this time.

16 CHAIRMAN MILLER: Please call them discrepancies  
17 in the drawing then, and you may inquire.

18 BY MR. RILEY:

19 Q What is the nature of these discrepancies?

20 A There is an ovality condition and a bowed  
21 condition.

22 Q The second condition?

23 A A bow.

24 Q Does bow mean that the inside of the cask is not  
25 symmetrical to the cask axis?



A That's true.

Q Would that not interfere with the insertion of a properly dimensioned basket?

A No, sir. The amount of bow is not sufficient to provide interference with the basket.

Q Could you give us an idea of the order of magnitude of the bow?

A The approximate clearance between the basket and the I.D. of the cask is a half inch. The amount of differences we're talking about in bow is in the neighborhood of about 100 mills, .10.

Q .10 inches?

A Over drawing tolerances, yes, sir. Maybe 150.

MR. RILEY: That completes my questions. Thank you, Mr. McNeill.

CHAIRMAN MILLER: Any thing further from the witness?

MR. HOEFLING: Yes, Mr. Chairman.

CHAIRMAN MILLER: Proceed.

REDIRECT EXAMINATION

BY MR. HOEFLING:

Q Mr. McNeill, with regard to the manufacture of the casks, is the manufacturer required to have a quality assurance program?

A Yes. The manufacturer is required by Part 71,

1 Appendix E.

2 Prior to the existence of Part 71, Appendix U, it  
3 was still required, as is the case with the NAC cask, by the  
4 mechanism of the Safety Analysis Report.

5 Q Now, is the licensee required to have a quality  
6 assurance program?

7 A Yes. The same Safety Analysis Report details the  
8 licensee's quality assurance program. As a matter of fact,  
9 the manufacturer's quality assurance program also detailed  
10 out the role of U. S. Testing.

11 Q Now, would the licensee's quality assurance  
12 program call for auditing of the manufacturer?

13 A Something just clicked in the back of my head.

14 May I go back to the last question and correct  
15 something? I said the Safety Analysis Report. It's addendas  
16 to the Certificate of Compliance that have that information,  
17 such as the Excelco quality assurance program, U. S. Testing,  
18 and the NAC quality assurance program.

19 Q Thank you.

20 The pending question is: Would the licensee's  
21 quality assurance program call for auditing of the manufac-  
22 turers?

23 A Yes, indeed, it does.

24 Q Now, does the NRC practice a program of periodic  
25 audits of either the licensee or the manufacturer?

1 A We do not particularly audit the licensees. We  
2 do audit the manufacturers as a check on the quality effort  
3 of the licensee.

4 Q Fine.

5 Now, I want to go to the situation where we have  
6 what is -- well, let us call it a repair situation of a cask.

7 A All right.

8 Q Would the repair of the cask be the subject of a  
9 quality assurance program?

10 A Certainly.

11 Q Would that program call for auditing of the repair  
12 activities?

13 A It would most certainly.

14 One of the criterions of Appendix E is titled  
15 Non-Conformances, and another criterion as Corrective Action.  
16 Between these two it would detail out such things as we  
17 mentioned before, identification of the disposition of the  
18 cask, condition, to rework it, to repair it, or accept as is.

19 Q Now, if the repair were performed by a group  
20 other than the licensee, would the licensee be required to  
21 have a quality assurance program in place to cover that  
22 repair activity conducted by, let's say, a subcontractor?

23 A Certainly. There would be a quality assurance  
24 program established to pass on the applicable elements of  
25 Appendix E, so that those doing the repair would have a

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1 requirement to meet Appendix E, in whole or in part.

2 The repair activity itself, would again, much like  
3 the manufacturing, be done by someone with an established  
4 quality program. The procurement activities, the surveillance,  
5 would also be done by the licensees.

6 Q Now, if the disposition of a problem cask is to  
7 use as is, who within the NRC, if you know, would approve of  
8 that disposition?

9 A In that case, the license would have to be  
10 amended. The licensee would address this question to the  
11 Transportation Branch. They'd say we no longer have "x"  
12 amount of shielding, or something like that, identify that  
13 as an amendment to their license, where they said they had  
14 something else.

15 And this condition would be reviewed by the  
16 Transportation Branch, and either accepted or rejected by  
17 them.

18 Q Can you tell us what, if you know, what the  
19 basis of their review would be, the types of information,  
20 if you know?

21 A Their review would be much like the review that  
22 they do with an original cask application. They would look  
23 at it structurally, they would look at it radiologically,  
24 and things like that, keeping in mind the premises that they  
25 must always work with at protecting the health and safety

of the public.

MR. HOEFLING: That's all I have, Mr. Chairman.

CHAIRMAN MILLER: Any further questions?

MR. RILEY: A little recross, Mr. Chairman?

CHAIRMAN MILLER: Yes.

RECCROSS-EXAMINATION

BY MR. RILEY:

Q Why is the sort of review on a repair operation not done on a sampling basis as the manufacturing is?

A Could you rephrase that question once again?

Q Yes. Why isn't the inspection process on repair jobs done on the sampling basis that cask manufacture is done? We found out that we didn't have 100 percent inspection there, and if I interpret your remark correctly you're saying you do have 100 percent inspection on repair work. And I'm saying why not on a sampling basis?

A I did not, to the best of my knowledge, nor did I mean to imply such, that we would inspect repairs 100 percent.

Q Thank you.

A Does that answer your question?

MR. RILEY: It does.

CHAIRMAN MILLER: Anything further? Very well, you may be excused, Mr. McNeill.

MR. HOEFLING: Mr. Chairman, may I raise a matter?

1                   CHAIRMAN MILLER: Now.

2                   MR. HORNUNG: This has to do with the hearing  
3                   question that we dealt with, and the confidentiality of that  
4                   working information.

5                   I see a problem here along the following lines:

6                   The Staff would venture to file some testimony  
7                   with this Board in this area prior to the September hearings,  
8                   and that testimony could conceivably contain the type of  
9                   information that we have discussed here that the Staff has  
10                  urged should be confidential.

11                  The Staff may take an appeal from the Board's  
12                  determination, in which event the Staff would still wish to  
13                  file that testimony with this Board so that we could go  
14                  forward in September while that appeal would be pending.

15                  I've inquired of the parties whether they would  
16                  agree to treat that testimony as confidential in the event  
17                  that the Staff does appeal during the term, or during the  
18                  pendency of that appeal, and they have so agreed.

19                  I would like to put this agreement before the  
20                  Board for its endorsement so that we could get this testimony  
21                  out to Mr. Roisman, Mr. Riley, Mr. Wilson and Mr. McGarry  
22                  and the Board Members, and be prepared to go forward in  
23                  September, given the possibility that the State might pursue  
24                  this, too, to the Appeal Board.

25                  CHAIRMAN MILLER: Well, let's hear from other

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1 counsel first. Who wishes to be heard?

2 MR. ROISMAN: Well, Mr. Chairman, let me make  
3 clear what my position is on this:

4 Number 1, if the Staff provides us with the  
5 information, the only person at the Natural Resources  
6 Defense Council that will look at it under any agreement such  
7 as this will be myself. Drs. Goffman and Tamplin, who would  
8 be the ones who would have to analyze it, would not do so  
9 until such time as they could see it unrestrained.

10 So that its early receipt by us would enable me  
11 to look at it, but I would not be able to consult with my  
12 experts. That might mean that at the time of the hearing  
13 if the issue came up the very first day, as we propose it to,  
14 to accommodate Mr. Wilson, I might want to take the issue  
15 back up again in a day or two after my people have had a  
16 chance to look at it.

17 I've not worked out when the 30 days might expire.

18 Number two, it is my understanding that if the  
19 30 day stay expires without it having been reinstated by  
20 a higher board or by this Board, that the document in my  
21 hands would immediately become a publicly available document  
22 that I could show to my witnesses, and that I am not agreeing  
23 to some de facto extension of the stay beyond the 30 days  
24 the Board has granted, absent the Staff getting somebody else  
25 to give them more of a stay.

wsl 10

1 Third, I just want to note that I have not looked  
2 at the regulations, so I don't know what the rules are that  
3 are applicable here. The Board, as I understand its ruling,  
4 has neither granted an interlocutory appeal, nor certified the  
5 question. It's left that as an issue that the Staff would  
6 have to fight out for itself.

7 I don't know what, if any, time limits are  
8 applicable to the Staff taking an appeal from the Board's  
9 order, but I would just note on a non legal basis my objection  
10 to the Staff waiting until the end of the 30-day period to  
11 file any pieces of paper with regard to it. I think it would  
12 do two things if they did that:

13 One, it might force me, at the very time that I'm  
14 trying to be ready for the hearing on the 10th, to also be  
15 trying to respond to a motion and, two, it would seem almost  
16 certainly to postpone the conclusion of the hearings well  
17 beyond the week of the 10th.

18 It would be my hope that the Staff would move  
19 almost immediately upon its return to Washington either to  
20 file an appeal, or to notify the parties that it was not  
21 going to file an appeal, and that the Board could dissolve  
22 the stay.

23 CHAIRMAN MILLER: Mr. McGarry?

24 MR. MC GARRY: I think counsel have summed up our  
25 understanding of the situation, Mr. Chairman.



CHAIRMAN MILLER: Mr. Wilson?

MR. WILSON: That essentially is our understanding too, Mr. Chairman. We would also concur in the effort to have the Staff notify us, one way or the other, as soon as possible of their decision on how to proceed.

At the proceeding in September we're going to make every effort to have at least another half a day, if at all possible, available if need be. So I could leave sometime the middle of Tuesday and still get back into Columbia in time to make my other commitments.

In the meantime, we're perfectly amenable to treating this material in a confidential manner. My technical assistant and the other members of the Department of Health and Environmental Control in the State, the Radiological Health Division which is concerned with this, we consider them bound through my office in this respect, and certain members of that staff would be reviewing it too, but they would certainly treat it in the same manner of confidentiality that we have agreed to here.

CHAIRMAN MILLER: Mr. Riley?

MR. RILEY: We would have no difficulty in accepting the proposal. It would not go beyond myself until the stay on confidentiality was released. We would join with Mr. Roisman in expressing a desire for an early decision by the Staff on whether or not it would appeal, and notification of the parties of their action.

WTL/ebf

(The Board conferring.)

CHAIRMAN MILLER: Well, the Board has certainly no objection inasmuch as Counsel and the parties have agreed to receive this material upon a confidential basis which has been described and I believe stipulated to by all Counsel and all parties. As far as the Board is concerned, we would prefer not to have it filed because we don't really need it. We'd prefer not to have it filed until the matter of in camera or non-in camera proceedings is determined, which won't handicap anyone because the Staff will be free to take their appeal. And we would want it to be sealed and remain sealed until the matter is disposed of one way or the other.

But the Board wishes to indicate its position in the matter. We don't wish to have anything filed with us until -- if it's in camera or subject to any inhibitions upon the Board for use of it.

MR. MC GARRY: Mr. Chairman, as I understand it, that would not prohibit the Staff to serve it on the parties or provide it to the parties?

CHAIRMAN MILLER: That's correct. Staff and the parties are free to do as they have agreed and stipulated. And you're on your own in that respect. We're certain you will all heed the limitation that you have imposed upon yourselves, but it is not Board action. The Board has, however, no objection.

WEL/cb2 1 I think that's probably all that you require of  
2 the Board, is it not, at this time? You've been requested,  
3 and I'm sure it's your own intention, as far as the Staff is  
4 concerned, to seek an early determination or at least some  
5 action, whatever the Staff decision is, in order to accommo-  
6 date the parties.

7 Our stay was for 30 days. We think that expires  
8 on September 6th, somewhat in advance of the September  
9 resumption of the hearing, thereby giving time for everyone  
10 to determine what he or she wishes to do.

11 Anything further? Or does this pose problems for  
12 any of you?

13 All right. We'll consider then that that takes  
14 care of the status at the moment of the transportation matters  
15 and you will keep each other and the Board informed I'm sure.

16 Is there anything else that you want to take up  
17 now at this time?

18 MR. KETCHEN: Yes, sir. I think it's an appro-  
19 priate time to mention a corollary matter that comes to mind  
20 which is we are going, according to the stipulation, around  
21 September 4th on this physical security plan matter, which  
22 is different, the physical security plan at McGuire.

23 We're going to have the report completed, as I  
24 understand it, based on everything I've said in that stipula-  
25 tion. However, we haven't faced the problem in that matter

WELL, eb3

1 there are no contentions. The parties want to look at the  
2 physical security report that we're going to file. That's  
3 probably going to be different than the physical security  
4 plan. In other words, it, too, will create problems with  
5 confidentiality.

6 I just want to mention that to the Board. There's  
7 no problem yet because we haven't the report. And I don't  
8 know whether anyone wants to talk about it at the hearing  
9 or not at this point. But I don't think it's premature to  
10 raise it. I just want to indicate that it could create a  
11 problem in the future.

12 DR. LUEBKE: I'd like to ask, Mr. Ketchen, is this  
13 a matter in controversy?

14 MR. KETCHEN: Not at the present time. But based  
15 on things I've heard, it could come up at some time.

16 CHAIRMAN MILLER: Well, that is a separate and  
17 distinct matter covered by existing regulations and those  
18 matters have been adjudicated by the Appeal Board, have they  
19 not?

20 MR. KETCHEN: Yes, sir.

21 CHAIRMAN MILLER: So we have an outline procedure  
22 that you're all familiar with and that does not impinge in  
23 any way upon the other matter which is sub judice.

24 MR. KETCHEN: No, sir, it doesn't.

25 CHAIRMAN MILLER: Thank you.

WEL/stc

Does anyone have any problem or question regarding the plant security that Mr. Ketchen has alerted us to?

(No response.)

I take it that will proceed then on course, and no problem is anticipated. And if the matter is filed, you'll take appropriate action and we'll be convening for the week of September 10th in Washington, D. C., that is to say in Bethesda where the offices are located on the fifth floor of the East-West Towers which is the courtroom that's shared by the Licensing Board and the Appeal Board that you are all familiar with.

Is there anything further?

MR. KETCHEN: Yes, sir. We would like to recall Mr. Spitalny to the witness stand to respond to Mr. Roizman's question asked yesterday about, I believe, when would the date have been to make a decision about poison racks.

CHRISTIAN MILLER: All right, Mr. Spitalny. Would you come forward, please?

Whereupon,

BRETT S. SPITALNY

resumed the stand on behalf of the Regulatory Staff and, having been previously duly sworn, was examined and testified farther as follows:

MR. KETCHEN: Mr. Spitalny also has a package of documents with him. I'll just go ahead and indicate to

WEL/abb

1 the Board that he is also up there in response to Mr. Roisman's  
2 request about cross-examination on the Freedom of Information  
3 Act materials that Mr. Roisman obtained from the Staff.

4 On that issue, the Staff has recalled him over  
5 objection. We think it's inappropriate, based on the earlier  
6 grounds. But over that objection, he is there.

7 We attempted to contact Mr. Glenn. I wasn't  
8 aware personally that he had been released to go to take care  
9 of other business and then to return to Washington State,  
10 and he got away from me, and we're attempting to get head  
11 him off at the airport. So far we've been unsuccessful.

12 CHAIRMAN MILLER: I think you'd better let him go  
13 home.

14 MR. KETCHEN: Well, he can if necessary-- If there  
15 are any questions that Mr. Spitalny can't handle, he will  
16 be at the September 10th hearing.

17 CHAIRMAN MILLER: That will be sufficient, I think.

18 Mr. Roisman, do you wish to proceed?

19 MR. ROISMAN: Yes, but I want to get something  
20 clarified.

21 Is it my understanding that these documents that  
22 I had flown down from Washington and didn't get here until  
23 last night after the hearing had closed that caused the  
24 subject of all this controversy had been in your possession  
25 down here at the hearing this week?

WEL, ab6

1 MR. KETCHEN: I haven't had them.

2 MR. ROISMAN: They were in the Staff's possession?

3 MR. KETCHEN: They were in the Staff's possession,  
4 yes.

5 MR. ROISMAN: Mr. Chairman, I really want to object  
6 to that. That is, in my judgment, extremely unethical con-  
7 duct when I made crystal clear that I was waiting for the  
8 documents. I mean this whole thing now, the dispute as to  
9 whether the witness should be back or not, Mr. Glenn has  
10 gone away-- The documents were here. I could have seen them.

11 The Staff made a big noise about being in favor  
12 of volunteering information. No one volunteered that the  
13 FOI materials were down here in Charlotte already. I could  
14 have read them. I could have looked at them. I didn't have  
15 to wait to have this thing flown down at \$25.

16 MR. KETCHEN: Mr. Chairman, I resent the remark  
17 about unethical.

18 CHAIRMAN MILLER: Well, strike the "unethical"  
19 but what are the facts.

20 Now did the Staff have those documents?

21 MR. KETCHEN: We did have them. I assumed  
22 Mr. Roisman got them. How do I know?

23 CHAIRMAN MILLER: He made a statement here before  
24 us that he was expecting them and had just received them, as  
25 I recall.

WEL/eb7

1 When was that statement made?

2 MR. ROISMAN: Well, it was made during the early  
3 part of the day yesterday; at least then. I don't know if  
4 it was made earlier than that or not.

5 What I identified was the problem I had had be-  
6 cause the FOI requested documents had not actually physically  
7 been made available to me until after the close of business  
8 on Friday.

9 CHAIRMAN MILLER: That is correct. We recall that.

10 Mr. Ketchen, we think that the Staff should have  
11 been forthright and should have produced them.

12 You may ask Mr. Spitalny to step down and please  
13 have him and the other witness available on September 10th.  
14 And let Mr. Roisman have in the meantime whatever documents  
15 there are, without any fooling around.

16 MR. KETCHEN: I understand he has the documents  
17 now.

18 CHAIRMAN MILLER: He has them now, but he should  
19 have had them sooner. The Staff should not play games.

20 MR. KETCHEN: We weren't playing -- in any way  
21 trying to play games, Mr. Chairman. We were --

22 CHAIRMAN MILLER: It was clear to the Board that  
23 there was a problem about when he was receiving the Freedom  
24 of Information requested documents. Certainly we did not know  
25 as a Board that the Staff at that very time had them, and



WEL, 408

1 we think you should have disclosed it.

2 We don't want to make a federal case out of it, but  
3 we think you were wrong, just as we previously told Mr. Roisman  
4 we thought he was wrong on a better matter that you raised.  
5 Let's let it rest there.

6 But have whatever documents in the meantime, and  
7 have the two witnesses available, by agreement if necessary,  
8 for September 10th.

9 You may step down, Mr. Spitalny.

10 (Witness excuse.)

11 CHAIRMAN MILLER: Is there anything further?

12 MR. KETCHEN: Mr. Chairman, may I make a comment?

13 CHAIRMAN MILLER: Yes.

14 MR. KETCHEN: I want to be clear that,  
15 Mr. Chairman, when I received the request for the Freedom --  
16 I didn't receive it. When the Commission received the Freedom  
17 of Information Act materials, I didn't personally handle it  
18 but I contacted the people on the Staff who handle those  
19 type of matters every day.

20 And we followed the procedures and policies  
21 established in the Staff to respond to Freedom of Information  
22 Act requests.

23 CHAIRMAN MILLER: We'll accept that. You will  
24 note that what we said was "Staff." We did not say you, sir.  
25 We do not think that the Staff, however proceeded properly.

WEL/eb9

1 at least in the sense of not being forthright and assisting  
2 this and any Board by a prompt supplying of documents rather  
3 than what appeared to us as being some unnecessary dilatori-  
4 ness.

5 And so we're talking now about the Staff, we are  
6 not castigating you as such, because we are assuming that  
7 you, as a member of the legal staff, are complying with what-  
8 ever rules you are governed by, which are, of course, dis-  
9 tinct and separate from what this Board is governed by.

10 We'll leave the matter there. We're not pleased  
11 with it but we're not blaming you personally. Is that clear?

12 MR. KETCHEN: That's clear.

13 If on the other hand I made a mistake in not  
14 volunteering the documents I'll take the blame, but I never  
15 understood my obligation to do so. With that, I'm prepared  
16 to drop the matter.

17 CHAIRMAN MILLER: All right.

18 MR. MC GARRY: Mr. Chairman, two observations.

19 One, I think there's another open matter concern-  
20 ing Mr. Spitalny. Perhaps we can take that up.

21 CHAIRMAN MILLER: All right, if there is, tell us.

22 MR. MC GARRY: And then maybe I'll just inquire  
23 of Mr. Roisman if he feels that he can cross-examine  
24 Mr. Spitalny on the Freedom of Information Act material at  
25 this time.

WEL/eb10 1 MR. ROISMAN: It will be substantially easier  
2 with Mr. Glenn. Part of it relates to materials written by  
3 Mr. Glenn. Some of it is his handwriting which appears, but  
4 I can't tell for sure.

5 CHAIRMAN MILLER: Rather than have any confusion  
6 then, we'll take care of it on the 10th.

7 What is the other matter, Mr. McGarry?

8 MR. MC GARRY: I believe there was a number there  
9 that --

10 MR. ROISMAN: It's the Oconee Number 3 number,  
11 Mr. Chairman, on that reracking question.

12 CHAIRMAN MILLER: Mr. Spitalny, come forward,  
13 please.

14 Whereupon,

15 BRETT S. SPITALNY

16 resumed the stand on behalf of the NRC Regulatory Staff and,  
17 having been previously duly sworn, was examined and testified  
18 further as follows:

19 FURTHER CROSS-EXAMINATION

20 BY MR. ROISMAN:

21 Q Mr. Spitalny, I think the question on the table  
22 is: If we assume that Oconee 3 cannot be reracked without  
23 draining the pool and effectively removing all the spent  
24 fuel, and if we assume that that is something for which there  
25 is not available storage space on the site now and could

WEL/eb11

1 not be made available short of building an independent spent  
2 fuel storage facility on the site, what was the date on  
3 which, if there was such a date, one could have reracked  
4 Oconee Unit 3 with the poison racks?

5 A There is such a date. To calculate that date  
6 requires you to look at when the number of spent fuel  
7 assemblies at the Oconee site was less than 336, which was  
8 the total number of spaces available in the Unit 1 and 2 pool.

9 In September of 1976 there were 233 assemblies  
10 onsite. Of these, 56 had just been recently discharged into  
11 the Number 3 pool. It would require moving those 56 out of  
12 that pool.

13 To move those assemblies, first of all it would  
14 require them to decay for a period of 120 days, then begin  
15 the transfer process at the average rate of one per day,  
16 which would take approximately two months.

17 That then puts us at the time frame of March '77.

18 In May of '77 there would be another discharge  
19 from the Unit 2 pool, and also August of '77, there would be  
20 a second discharge from the Unit Number 1 pool. At the end  
21 of those two discharges the total number of assemblies would  
22 be 345, which would be in excess of that of the Unit Number  
23 1 and 2 pool, which means prior to the August 1977 discharge,  
24 you would have to complete reracking of the Oconee 3 pool.

25 Backing up, if that was the completion date and

1 we allow four months to install the racks, we would have had  
2 to have started at about April of 1977. The decision to in-  
3 stall poison racks would back up approximately 15 months from  
4 that time, which puts us at about May of 1976. That would be  
5 the actual decision date.

6 At that particular time, May of '76, the Applicant  
7 was under the understanding that reprocessing would take care  
8 of their spent fuel and was not necessarily faced with a  
9 storage problem that they knew of.

10 Additionally, in May of 1976, the use of poison  
11 racks was not a widely acceptable alternative. At that time,  
12 May of '76, there had been one installation of poison racks  
13 and two other applications on file with the Staff. So that  
14 experience to draw on at that time was also limited.

15 MR. ROISMAN: Mr. Chairman, may I move to strike  
16 the portion of the answer that speculated on what the  
17 Applicant knew about the existence of the reprocessing in  
18 May of 1976.

19 CHAIRMAN MILLER: Yes, that portion may be stricken.

20 BY MR. ROISMAN:

21 Q Mr. Spitalny, let me just ask you a couple of  
22 questions.

23 As of May, 1976, what was the status of the Oconee  
24 3 pool? Had it yet been reracked? It has been reracked once  
25 I know, but was that reracking done at that time or was it --

WEL/eh 3

A If I recall the dates -- they're spelled out in the Environmental Impact Appraisal -- it was the end of 1974 that they had filed, and it was the beginning of 1975-- It was during the time frame of 1974 when they were anticipating reracking and filing the application.

End 8

The completion of it I believe took place in 1975.

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1 A I could verify that by looking at the EIA.

2 Q That's all right, if it's in there. We will  
3 assume that whatever is in there is what you meant to testify  
4 to, and if there was a slight difference we'll understand  
5 that.

6 A That's exactly right.

7 Q Why do you feel so hesitant about the acceptabil-  
8 ity of the poison racks, given that the Staff had already  
9 actually approved the installation of poison racks as of  
10 May of 1976 in at least one reactor?

11 A Why do I feel so hesitant?

12 Q Why did you feel that it might be questionable  
13 as to whether someone would be willing to go for poison  
14 racks, given that the Staff apparently had completed a  
15 review and found poison racks essentially acceptable in a  
16 reactor as of May of 1976?

17 A There were two applications that were on file  
18 with the Staff which had not been completed. The one that  
19 you referred to, I believe, that had been completed was  
20 installed in 1965, and there had been a number -- a numerous  
21 amount of changes -- well, I don't know that for a fact, the  
22 exact amount of changes. But it was quite a period of time,  
23 where the type of racks may have changed.

24 I don't know what had happened between 1965 and  
25 the period 1976.

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Q To the best of your knowledge, did Duke approach the Staff at any time in 1975 or 1976 to inquire as to the regulatory attitude with respect to the use of poison racks?

A I have no knowledge of that.

MR. ROISMAN: That's all, Mr. Chairman.

CHAIRMAN MILLER: Very well. Does anyone else wish to interrogate along the same subject?

MR. MC GARRY: No, Mr. Chairman.

CHAIRMAN MILLER: Thank you, Mr. Spitalay, you may step down.

I assume you had no further --

MR. KETCHEN: I was going to ask one quick question.

CHAIRMAN MILLER: Go right ahead.

REDIRECT EXAMINATION

BY MR. KETCHEN:

Q What was the status of reprocessing in 1976?

A At that time reprocessing was assumed to be a viable -- was assumed to be coming around, and there had been no actions to defer or do anything to delay reprocessing at that time.

MR. ROISMAN: I'm going to object and ask that the answer be struck. If the witness wants to give us the whole status of reprocessing as of May of 1976, I assume he'd like to mention that organizations which I consider of some



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1 stature, such as the Natural Resources Defense Council, were  
2 adamantly opposed to it and had published a substantial number  
3 of papers on it.

4 There was a GESMO hearing going on investigating  
5 the wisdom of reprocessing at that time, and I believe there  
6 was a Second Circuit Court decision effectively staying any  
7 reprocessing activity, as a result of the absence of completion  
8 of GESMO.

9 I don't think the witness has given us a complete  
10 answer on all of this, and I have no reason to believe that  
11 he is qualified to do so. I'd like the answer struck.

12 Mr. FETCHEN: Can he give his understanding?

13 CHAIRMAN MILLER: I'm sorry, I missed the  
14 reference to reprocessing. What was it?

15 What did you say about that, Mr. Spitalny?

16 THE WITNESS: I stated in May of 1976 that the  
17 utilities -- I may have stated the Applicant -- was under the  
18 impression that reprocessing would become available. There  
19 were no --

20 CHAIRMAN MILLER: This statement has been made  
21 three or four times in the course of the hearing. We don't  
22 take it as being probative of anything in particular, but if  
23 that's the --

24 MR. ROISMAN: No, I hadn't objected before but  
25 what I believe he said was that it was generally assumed. And

1 I wanted to speak for this organization, for the Second  
2 Circuit Court of Appeals, for the witnesses in the GESMO  
3 process, and so forth.

4 I mean if he's limiting it generally to say that  
5 it's his understanding that this utility thought that, or --

6 CHAIRMAN MILLER: All right. I get your point  
7 now.

8 Is it your testimony that utilities generally,  
9 and perhaps Duke, were under a certain impression regarding  
10 reprocessing, without attempting to get into the merits of  
11 it or the extent of dissent on that point?

12 THE WITNESS: It is my testimony that reprocessing  
13 had not been indefinitely deferred.

14 CHAIRMAN MILLER: In May of 1976?

15 THE WITNESS: That's correct.

16 CHAIRMAN MILLER: All right. That's neutral, I  
17 think. We'll let it stand.

18 That was prior to the election of 1976. We  
19 can take official notice of that.

20 MR. ROISMAN: That's right. And one could  
21 interpret the Court of Appeals decision in the Second Circuit  
22 as having indefinitely deferred it, but I will leave that to  
23 legal argument.

24 CHAIRMAN MILLER: All right. Fair enough.

25 MR. KETCHEN: Mr. Chairznan, I have an additional

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1 matter to take up.

2 CHAIRMAN MILLER: Does it involve Mr. Spitalny?

3 MR. KETCHEN: No, it doesn't.

4 CHAIRMAN MILLER: Is everyone through with Mr.  
5 Spitalny?

6 (Laughter.)

7 MR. ROISMAN: Are you kidding?

8 (Laughter.)

9 CHAIRMAN MILLER: On this round? Mr. Spitalny's  
10 round will end now. You may step down, and I thank you, sir.

11 (Witness excused.)

12 MR. KETCHEN: May he go to Miami now?

13 CHAIRMAN MILLER: Have a nice trip to Miami, Mr.  
14 Spitalny.

15 All right. What was the other matter?

16 MR. KETCHEN: Mr. Chairman, I would like to at  
17 this time -- Staff has no more witnesses to present at this  
18 point. However, I would like to take up the matter of the  
19 Staff evidence and its status, and what I would like to do  
20 is move the admission of Staff evidence and ask that it be  
21 bound in the record as though read.

22 Some of the evidence is, I don't think, going to  
23 be objected to. Some is. I would move that it be bound into  
24 the record as though read, subject to the motions to strike.

25 The purpose is it would, I think, get it into the

1 record in one place and at least for the Staff would save  
2 having to carry documents back and forth. Once we get it into  
3 the transcript it becomes very helpful.

4 I would propose to run through the exhibits and  
5 list the ones that I would request be bound in.

6 CHAIRMAN MILLER: Let me see, first of all, is  
7 there any objection, with the limitations stated by counsel?

8 MR. ROISMAN: As long as it's not the Safety  
9 Evaluation Report or the Environmental Impact Appraisal, which  
10 we know are subject to subsequent amendment, and if it's  
11 limited to these things which we've essentially completed our  
12 cross-examination on, I have no problem, subject to the  
13 understanding of the motions to strike.

14 CHAIRMAN MILLER: All right.

15 Mr. Riley, Mr. McGarry, Mr. Wilson? So say you  
16 all?

17 MR. RILEY: Yes.

18 MR. KETCHEN: Mr. Chairman, my motion was to  
19 include the Environmental Impact Statement, the Safety  
20 Evaluation Report and the errata sheets.

21 CHAIRMAN MILLER: Well, the errata sheets pertain  
22 to what? What errata?

23 MR. KETCHEN: I'm sorry. The exhibits, for  
24 example, like 24, which was a second errata to the Environ-  
25 mental Impact Statement, which was handed out yesterday or

1 the day before.

2 CHAIRMAN MILLER: You realize, do you not, the  
3 Board has never seen the so-called errata sheet that you keep  
4 telling us you passed around? All right, we'll accept your  
5 description. We've never seen it.

6 Let me indicate, in response to your motion, we  
7 will certainly permit the introduction, the offer, of having  
8 bound in the record the proffered written testimony as to  
9 which there's been cross-examination, or any documents that  
10 relate thereto.

11 We do not wish to have bound into the record at  
12 this time the -- what do you have, a Safety Evaluation Report?

13 MR. KETCHEN: We have a Safety Evaluation Report,  
14 the Environmental Impact Appraisal, and Exhibit 24, which I  
15 believe you've just been handed. That would be Staff Exhibit  
16 24 for identification, which was --

17 CHAIRMAN MILLER: For which there are amendments  
18 or errata to both of those documents?

19 MR. KETCHEN: That one was -- yes, that's to  
20 both.

21 CHAIRMAN MILLER: You say this is the second  
22 errata sheet? Is there a first one?

23 MR. KETCHEN: The first one was Exhibit 7, I  
24 believe.

25 CHAIRMAN MILLER: Hasn't that been admitted in

evidence?

MR. KETCHEN: No.

CHAIRMAN MILLER: All right, we'll admit 7 into evidence, and we'll deny the admission at this time of the second errata sheet, or of the Safety Evaluation Report.

(The document heretofore marked for identification as Staff Exhibit 7 was received in evidence.)

We will also deny admission at this time of the Environmental Impact Appraisal, or any supplements thereto.

We will defer ruling until -- we understand from previous remarks that you will have or may have some additional supplements thereto, so we'll take these matters up at the September hearing.

The others may be bound into the transcript, and some of them are subject to motions, some not. But since they've been presented and the witnesses cross-examined, they may be bound into the record, although without prejudice to the rights of counsel to file whatever objections they want and have appropriate rulings from the Board.

Any questions?

MR. KETCHEN: You're saying you're not allowing the SER and the EIA to be bound in the record at this time?

CHAIRMAN MILLER: That's correct. Not only to be

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1 bound in the record, we're deferring any ruling thereon, and  
2 part of the basis of our ruling, anyway, is the fact that  
3 we expect that you will be filing amendments or supplements,  
4 as you previously indicated, to those documents, or at least  
5 there is that possibility.

6 MR. KETCHEN: All right.

7 Then may I run through the numbers, then?

8 CHAIRMAN MILLER: Yes.

9 MR. KETCHEN: The testimony I'm referring to is  
10 Number 13, Number 15, Number 16A, Number 16B, Number 17A,  
11 Number 17B, Number 17C, Number 18A, Number 18B, Number 18C --

12 MR. ROISMAN: One of those C's is --

13 MR. KETCHEN: 18C was withdrawn. Not 18C.

14 Number 19A, Number 19B, Number 19C, Number 19D.  
15 Number 22, which were the notes of Mr. Spitalny. Number 26A,  
16 Number 26B, Number 27A, Number 27B.

17 And that completes that list.

18 (The documents heretofore marked  
19 for identification as Staff  
20 Exhibits 13, 15, 16A, 16B,  
21 17A, 17B, 17C, 18A, 18B, 19A,  
22 19B, 19C, 19D, 22, 26A, 26B,  
23 27A and 27B were received in  
24 evidence.)

25 (The foregoing documents inserted at the end  
of this transcript.)

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1 MR. KETCHEN: I do have a request. Going through  
2 the transcript notes, I noticed that there were two I.D.  
3 numbers given in this hearing for Number 20. Number 20  
4 admitted into the record already, was Dr. Nehemias' testimony.  
5 Earlier on, the number 20 was assigned to the SER.

6 At this point I would like to withdraw the  
7 number 20 for the SER, and have that reidentified, if I may,  
8 as Staff Exhibit Number 28.

9 CHAIRMAN MILLER: All right, it may be so  
10 identified.

11 (The SER, previously marked for  
12 identification as Staff  
13 Exhibit 20, was re-marked as  
14 Staff Exhibit 28.)

15 MR. KETCHEN: And, Mr. Chairman, just for the  
16 record, may I identify at least the Safety Evaluation Report,  
17 or have it marked as Staff Exhibit Number 29?

18 MR. ROISMAN: The Safety Evaluation Report? I  
19 thought you just called it 28?

20 MR. KETCHEN: I'm sorry, did I make a mistake?  
21 Okay. Number 28 will be -- I would like marked  
22 for identification, is the SER. That's number 28.

23 The BIA has already been identified as Staff  
24 Exhibit Number 3.

25 CHAIRMAN MILLER: Yes. The document may be so



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1 identified, or in the case of the SER, re-identified.

2 MR. FETCHEN: That completes my offer, and I  
3 guess that completes at least this portion of Staff's case  
4 for this proceeding.

5 CHAIRMAN MILLER: Thank you, Mr. Ketchen.

6 Do counsel or parties have any other matters that  
7 they feel should appropriately be considered at this session?

8 MR. MC GARRY: The only comment I would have, Mr.  
9 Chairman, is that based upon a number of items that have come  
10 up this week, it seems we're going to have a busy session the  
11 week of the 10th, and I would suggest that we start Monday  
12 at 8:00 o'clock.

13 CHAIRMAN MILLER: Well, you know, we live there.  
14 We have no objection. I get to work at 7:15, as I think you  
15 know.

16 MR. MC GARRY: I'll amend that to 7:30.

17 MR. ROISMAN: Mr. Chairman, I would rather not.  
18 I commute out to Bethesda. If I go by any sort of public  
19 transportation, which is at least a possibility, that's  
20 really stiff. I would like to start at 9:00. I don't mind  
21 going a little later in the evenings.

22 CHAIRMAN MILLER: Well, how about 8:30? Let's  
23 try 8:30.

24 MR. ROISMAN: Knowing your compromises, I should  
25 have asked for 10:00.

wel 12

1 CHAIRMAN MILLER: Then I'd have given you 7:15.

2 (Laughter.)

3 CHAIRMAN MILLER: All right, we'll start at 8:30  
4 and see how it is. If it's too difficult for counsel, we'll  
5 take it into consideration. But you're right, there is a good  
6 deal to be done, and we would like to use our time profitably.

7 Thank you.

8 Anything further?

9 If not, ladies and gentlemen, thank you for  
10 meeting with us, and have pleasant trips home, those of you  
11 who are traveling, and we'll see you in Bethesda.

12 We stand adjourned.

13 (Whereupon, at 5:10 p.m., the hearing was  
14 adjourned, to reconvene at 8:30 a.m., Monday, 10 September 1979.)

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COMPARISON OF ALTERNATIVES

| <u>Alternative 1</u>   |                         | <u>Exposure Man-rem/yr</u> |              | <u>Cost</u>     |                  |
|--|-------------------------|----------------------------|--------------|-----------------|------------------|
|  |                         | <u>Per Assy</u>            | <u>Total</u> | <u>Per Assy</u> | <u>Total</u>     |
| Transshipment (300 Assys)  |                         |                            |              |                 |                  |
| Applicant  | Handling                | 0.1 (a)                    | 30           |                 |                  |
|  | Drivers (2)             | .052                       | 15.6         |                 |                  |
|  | Public                  | .0003                      | 0.1          |                 |                  |
|  |                         |                            | <u>45.7</u>  | 2461            | 708,000          |
| Staff (a)  | Handling                | 0.24                       | 72           |                 |                  |
|  | Drivers (2)             | .053                       | 16           |                 |                  |
|  | Public                  | .0003                      | 0.1          |                 |                  |
|  |                         |                            | <u>88.1</u>  | 3500            | 750,000          |
| <u>Alternative 2</u>   |                         |                            |              |                 |                  |
| Rerack (high density stainless steel-750-336-414 additional spaces)  |                         |                            |              |                 |                  |
| Applicant  | Handling                | .18                        | 76           |                 |                  |
|  | Drivers                 | (c)                        |              |                 |                  |
|  | Public                  | (c)                        |              |                 |                  |
|  |                         |                            | <u>76</u>    | 8300            | 2,490,000        |
| Staff  | Handling                | .05                        | 20 (d)       |                 |                  |
|  | Drivers                 | (c)                        |              |                 |                  |
|  | Public                  | (c)                        |              |                 |                  |
|  |                         |                            | <u>20</u>    | 5500            | 1,550,000        |
| <u>Alternative 3 (e)</u>   |                         |                            |              |                 |                  |
| Rerack (Poison Racks - (1239-336 = 983 additional spaces) assuming no prior rerack)                            |                         |                            |              |                 |                  |
| Applicant  | Handling (racks)        | .08                        | 76           | 4000            | 3,812,000        |
|  | trans                   | .1                         | 24 (g)       | 640(h)          | 610,000          |
|  | Drivers (trans)         | .052                       | 12 (g)       |                 |                  |
|  | Public (trans)          | .0003                      | 0.1 (g)      |                 |                  |
|  |                         |                            | <u>112.6</u> | <u>4640</u>     | <u>4,422,000</u> |
| Staff  | Handling (racks)        | .08                        | 20 (d)       | 3000            | 2,859,000        |
|  | trans                   | .04                        | 39 (g)       | 650             | 620,000          |
|  | Drivers (trans)         | .053                       | 19 (g)       |                 |                  |
|  | Public (trans)          | .0003                      | 0.1 (g)      |                 |                  |
|  |                         |                            | <u>68.7</u>  | <u>3850</u>     | <u>3,479,000</u> |
| <u>Alternative 4</u>   |                         |                            |              |                 |                  |
| Rerack (Poison racks (1289 - 750 = 539 additional spaces) assuming prior reracking with stainless steel racks) |                         |                            |              |                 |                  |
| Applicant  | Handling (poison racks) | .08                        | 76           | 4000            | 3,812,000        |
|  | stainless steel racks   | .08                        | 76           | 2612            | 3,490,000        |
|  | Drivers                 | (c)                        |              |                 |                  |
|  | Public                  | (c)                        |              |                 |                  |
|  |                         |                            | <u>152</u>   | <u>6612</u>     | <u>7,302,000</u> |
| Staff  | Handling (poison racks) | .08                        | 20 (d)       | 3000            | 2,859,000        |
|  | (stainless steel) racks | .08                        | 20 (d)       | 1730            | 1,650,000        |
|  | Drivers                 | (c)                        |              |                 |                  |
|  | Public                  | (c)                        |              |                 |                  |
|  |                         |                            | <u>40</u>    | <u>4730</u>     | <u>4,509,000</u> |

**POOR ORIGINAL**

COMPARISON OF ALTERNATIVES

|   |          | Exposure Man-rem (g) |                   | Cost     |            |
|---|----------|----------------------|-------------------|----------|------------|
|   |          | Per Assy             | Total             | Per Assy | Total      |
| <u>Alternative A</u>  |          |                      |                   |          |            |
| Independent spent fuel storage<br>Installation - onsite<br>(1000 assemblies)  |          |                      |                   |          |            |
| Applicant   | Handling | 0.1                  | 30 <sup>(a)</sup> |          |            |
|   | Drivers  | negligible           |                   |          |            |
|   | Public   | 0                    |                   |          |            |
|   |          |                      | <hr/>             | 34,800   | 51,750,000 |
| Staff   | Handling | 0.24                 | 72                |          |            |
|   | Drivers  | negligible           |                   |          |            |
|   | Public   | 0                    |                   |          |            |
|   |          |                      | <hr/>             | 28,000   | 37,800,000 |
| <u>Alternative B</u>  |          |                      |                   |          |            |
| Independent spent fuel storage<br>Installation - offsite<br>(1000 assemblies) |          |                      |                   |          |            |
| Applicant   | Handling | 0.1                  | 30 <sup>(a)</sup> | 34,800   | 51,750,000 |
|   | Drivers  | .032                 | 16.0              | 2,461    | 738,000    |
|   | Public   | 0.0003               | 0.1               |          |            |
|   |          |                      | <hr/>             | 36,961   | 52,488,000 |
| Staff   | Handling | 0.24                 | 72.0              | 28,000   | 37,800,000 |
|   | Drivers  | .032                 | 16.0              | 2,500    | 750,000    |
|   | Public   | 0.0003               | 0.1               |          |            |
|   |          |                      | <hr/>             | 27,800   | 38,550,000 |

- a) Staff estimates are based on comparable experience and do not necessarily reflect conditions within the Duke system.
- b) Applicant's original estimate of 3.4 man-rem/shipment was lowered based on averages of 2 years of fuel handling experience.
- c) Driver and public estimates are not provided for the disposition of the racks.
- d) Staff estimate 40 - 60 man-rem for Duke Power reracking.
- e) Transshipment is required to accommodate working space (248 assemblies).
- f) For comparison purposes, doses are for the movement of 300 assemblies.
- g) Radiation dose as a result of pool operation has not been included.
- h) Costs for transshipment are averaged over total additional spaces gained.

**POOR ORIGINAL**

STATEMENT OF PROFESSIONAL QUALIFICATIONS

BRETT S. SPITALNY

I have been employed as a Process Licensing Engineer by the U. S. Nuclear Regulatory Commission since January 1978. This position is in the Fuel Reprocessing and Recycle Branch of the Division of Fuel Cycle and Material Safety of the Office of Nuclear Material Safety and Safeguards. This branch is responsible for licensing actions for irradiated fuels including licensing facilities for spent reactor fuel storage, facilities for spent fuel processing, and facilities for processing of materials recovered from spent fuel.

I am the NRC Project Manager for the Duke Power Company proposal of transporting spent fuel, and in this capacity am directly responsible for the health, safety and environmental reviews of this action. My responsibilities also include that of environmental project manager for the proposed expansion and license renewal of General Electric's Morris Operation Fuel Storage Facility.

Prior to my assignment at NRC, I was employed by the Department of the Navy. My affiliation with the Navy for 3 1/2 years was separated into two major capacities. From November 1976 until January 1978, while located with the Naval Ship Engineering Center

in Washington, D. C., I was employed as a General Engineer for a maintenance and reliability group for the extended operation of Polaris/Poseidon SSBN Nuclear Submarines. Responsibilities included evaluating system performance and response to maintenance and testing. The ultimate goal was to improve system reliability and extend the operating cycle of the systems and subsequently the ships.

From 1974 until October 1976, I was employed at Norfolk Naval Shipyard as a Mechanical Engineer in the Nuclear Production Department. I was assigned as a Nuclear Ship Superintendent. Responsibilities included scheduling, authorizing and overseeing all nuclear production on the overhaul of the ships. I became qualified to work on SSN 637 class nuclear submarines, and CVN-68 class nuclear aircraft carriers. This position required extensive training on Westinghouse and General Electric design (submarine) reactor power plants, and Westinghouse (carrier) plants. Qualifications also included successful completion of the eight week U. S. Navy Nuclear Ship Superintendent School at Puget Sound Naval Shipyard, Bremerton, Washington. I was also assigned the man-rem reduction program for Norfolk Naval Shipyard under direct control from Naval Reactors.

Prior to joining the Department of the Navy, I was employed by Cessna Aircraft Company through 1973 and 1974. I was employed as a Structural Engineer, and analyzed T-37 aircraft for structural damage and fatigue.

I received a Bachelor of Aeronautical Engineering Degree from Embry-Riddle Aeronautical University in 1973 and have done graduate work in Business Administration and Thermal Engineering at Wichita State University and Old Dominion University.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
DUKE POWER COMPANY )  
(Amendment to Materials License )  
SNM-1773 for Oconee Nuclear Station )  
Spent Fuel Transportation and Storage )  
at McGuire Nuclear Station )

Affidavit of Brett S. Spitalny  
and John P. Roberts

1. Our names are Brett S. Spitalny and John P. Roberts. We have prepared statements of professional qualifications which are attached to this affidavit.

2. This affidavit addresses Natural Resources Defense Council (NRDC) Contention 1 which reads as follows:

1. The proposed action is a step in the proposed program to handle the shortage of spent fuel storage space by shipping and storing spent fuel away from the reactor where it was generated. The proposed action has no independent value in solving the spent fuel storage problem and is inherently premised on the near-term construction of an interim away-from-reactor storage facility. The proposed action, if taken, will bias the final decision on whether to approve the program by foreclosing at-reactors options at both Oconee and McGuire. The proposed action is therefore inconsistent with the conditions 1 and 2 laid down by the NRC in promulgating the criteria for approval of interim spent fuel storage. (40 Fed. Reg. 42801). Thus, the proposed action cannot be acted upon until completion of impact statements on the proposed program now being conducted by DOE (Storage of U.S. Spent Power Reactor Fuel (DOE/EIS-0015-D) August 1978, and Supplement, December 1978; Storage of Foreign Spent Power Reactor Fuel (DOE/EIS-0040-D) December 1978; Preliminary Estimates of the Charge for Spent-Fuel Storage and Disposal Services (DOE/ET-0055) July 1978; Charge for Spent Fuel Storage (DOE/EIS-0041-D) December 1978; and NRC (Draft Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel (NUREG-0404)).

In addressing this contention, our response does not include consideration of the proposed program (identified as a DOE initiative) cited in the contention, or any national policy which may or may not be developed by the Federal Government. Our response rather follows the decision of the Commission that licensing actions such as the proposed be considered on a case by case basis on their individual merits. [Spent Fuel Storage, Intent to Prepare Statement on Handling and Storage of Spent Light Water Power Reactor Fuel, (40 Fed. Reg. 42801; September 16, 1975) (Commission Statement)] We adopt as part of the basis for our affidavit the analysis contained in the Environmental Impact Appraisal (EIA) (December 1978).

Proceeding on this basis we examined whether the action considered has independent utility pursuant to Factor 1 of the Commission Statement. The Commission's statement of Factor 1 is:

"It is likely that each individual licensing action of this type would have a utility that is independent of the utility of other licensing actions of this type."

Of the three reactors at the Oconee Nuclear Station, Units 1 and 2 are presently going to an 18 month fuel cycle, while Unit 3 will remain on an annual cycle. Units 1 and 2 will be discharging fuel assemblies at the rate of 72 every 18 months; and Unit 3 at the rate of 56 assemblies every 12 months.

The amount of space presently remaining in the reactor basins at Oconee will provide storage for 209 assemblies. Post irradiation examination (PIE) equipment and piping is installed in the Oconee 1 and 2 basin

occupying the equivalent of 51 assemblies of this available space. Therefore, after the Oconee 3 discharge in May 1979, the facility will operate with 158 readily available spaces. A full core load at each of the Oconee Units is equal to 177 assemblies. If for some reason, conditions dictated an unplanned core off-load, the "PIE" equipment could be removed to accommodate the discharge. This option, however, will be eliminated at the time of the next scheduled discharge in November, 1979. At the conclusion of that refueling, only 141 locations will exist, including those presently allocated for the "PIE" equipment.

The transfer of 300 assemblies as proposed in this licensing action would alleviate the immediate shortfall of storage capacity at Oconee. This action requires no other action on the part of the applicant either prior to or subsequent to transfer of the Oconee spent fuel to storage at McGuire to ensure its utility, nor do other licensing applications need to be made to ensure such utility. This action would provide 2-1/3 years of continued operation of the plants, and subsequent continued electrical power generation. Thus, this action, stand alone, has an independent utility regardless of any other actions of this type that the applicant may or may not pursue to provide additional future alleviation of storage capacity shortfall.

This contention continues to suggest that this action is inconsistent with the Commission's second . . . . That factor reads:

"It is not likely that the taking of any particular licensing action of this type during the time frame under consideration would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing action of this type."

With respect to the proposed licensing action, we have considered commitment of both material and nonmaterial resources, and our analysis is based on the fact that impacts from the proposed action are negligibly small, and, therefore insignificant (EIA, p. 59). The material resources considered are those to be utilized to ship Oconee spent fuel to McGuire. The nonmaterial resources are primarily the labor and talent needed to accomplish the proposed action and the available storage capacity which exists in the McGuire Unit 1 basin. Since the spent fuel storage capacity of the Duke system provides for sufficient total capacity to the mid-1990's, there does not appear a potential for impact on the capacity to provide for storage of McGuire spent fuel from this action. Additionally, a suitable spent fuel cask is available to the applicant. Hence, these resources were considered to be nonmaterial in nature. The only consumable material resource would be that of the diesel fuel used during the 340 mile round trip for each spent fuel assembly. Use of the amount of diesel fuel is really inconsequential when considering the proposed action or any other action to alleviate the spent fuel storage problem. The proposed action in simple terms is movement of spent fuel and storage in available space. Thus, it does not involve commitment of resources such as men and materials, and use of space and environmental resources (a

aquatic, and terrestrial resources); expensive equipment modifications; or construction and operation of fixed based facilities as do other suggested options. Thus, the proposed action is unique in the physical sense in that it would commit little, if any, material resources to a commitment that cannot be reversed. The Oconee spent fuel can always be moved at a later time from the available McGuire space if such a decision requires it.

Accordingly, based on our consideration of these factors, the proposed transshipment action does not constitute a commitment of resources that would tend to significantly foreclose other actions to ameliorate Duke Power Company's spent fuel storage space shortage at the Oconee facility.

The staff has concluded in the Environmental Impact Appraisal that this action has no significant impact on the quality of the human environment. In conclusion, the implementation of this action does not foreclose the applicant from installing additional storage capacity at Oconee, which on February 2, 1979, Duke applied for, nor does this action foreclose Duke from other alternative actions involving transfer of either the spent fuel involved in this action or other Oconee spent

fuel to additional storage capacity as it may become available at Ocone or elsewhere. Consequently, we conclude that this action is in accordance with the Commission's second factor.

Although this contention raises questions concerning only factors 1 and 2 of the Commission's notice (40 FR 42801), the Commission requires the staff to consider all five factors in examining license actions of this type.

The Staff's Environmental Impact Appraisal (EIA) addresses all of the five factors. The Staff has applied, balanced, and weighed all of these factors (EIA pp 61-64) and has determined that the proposed license amendment will not significantly affect the quality of the human environment and that there will be no significant environmental impact attributable to the proposed action.

As a result of this consideration of the five factors and this determination, the Staff has concluded that this is an appropriate action and should be allowed to proceed.

I hereby certify that the above statements are true and correct to the best of my knowledge and belief.

Brett S. Spitalny  
Brett S. Spitalny

John P. Roberts  
John P. Roberts

Subscribed and sworn to  
before me this 11<sup>TH</sup> day  
of May, 1979

Nadine C. Liden  
Notary Public

## STATEMENT OF PROFESSIONAL QUALIFICATIONS

JOHN P. ROBERTS

My name is John P. Roberts. I am Section Leader for Spent Fuel Storage Installations in the Fuel Reprocessing and Recycle Branch in the Division of Fuel Cycle and Material Safety in the Office of Nuclear Material Safety and Safeguards, United States Nuclear Regulatory Commission. I have been employed as a project manager for spent fuel storage licensing with title of Process Licensing Engineer since November 1976 and assumed the responsibility of section leader in October 1977. I am presently project manager for the Stone and Webster proposed spent fuel storage standard design review as well as project manager for the generic environmental impact statement on the Handling and Storage of Spent Light Water Power Reactor Fuel.

I have been employed by the Nuclear Regulatory Commission since December 1974 (when it was the Atomic Energy Commission). I was initially employed as a Criticality and Shielding Engineer to evaluate the safety of packaging designs for shipment of fuel and other radioactive materials. In October 1975 I was assigned to assist in the preparation of the Generic Environmental Statement on Mixed Oxide Fuel (GESMO). My duties included preparing an Integrated Environmental Impact Table for the nuclear fuel cycle and testifying in the GESMO proceedings.

Subsequently I was assigned to the Task Force for the Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle performing similar work.

Before joining the Commission I was employed by Harry Diamond Laboratories as a research physicist (nuclear) and then as a nuclear engineer performing radiation transport and effects studies from 1966-1974 with two years off for graduate study at the Catholic University of America.

From the Catholic University I received a Bachelor of Electrical Engineering degree (cum laude) in 1962 and a Master of Nuclear Science and Engineering Degree in 1965. While an undergraduate I was employed as an Engineering Aid at David Taylor Model Basin (now U.S. Naval Ship

Research and Development Center) in the summers of 1960 and 1961. I returned as an Electronics Engineer in the Summer of 1962. I served as a Graduate Teaching Assistant in the Catholic University, Nuclear Science and Engineering Division from 1962 to 1963 and in the Summer of 1963 was employed as an Electronic Engineer at the U.S. Army Nuclear Power Field Office at Fort Belvoir, Virginia. I am a member of the American Nuclear Society and of the Institute of Electrical and Electronic Engineers.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

DUKE POWER COMPANY

(Amendment to Materials License  
SNM-1773 for Oconee Nuclear Station  
Spent Fuel Transportation and Storage  
at McGuire Nuclear Station)

Docket No. 70-2623

TESTIMONY OF DARREL A. NASH<sup>a/</sup>

I, Darrel A. Nash, am employed by the Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Cost-Benefit Analysis Branch, as the Section Leader in Technology Assessment. I have reviewed the NRC Staff's "Environmental Impact Appraisal Related to Spent Fuel Storage of Oconee Spent Fuel at McGuire Nuclear Station - Unit 1 Spent Fuel Pool", Docket No. 70-2623, dated December, 1978, and will be available to offer background cost-benefit information regarding contentions 3 and 5 in this proceeding.

<sup>a/</sup> A copy of my professional qualifications has been previously filed in this proceeding.



The applicant uses a computerized probabilistic simulation production costing model to allocate load among units on their system and to make intersystem transfers.<sup>b/</sup>

In order to obtain cost estimates to reduced output of Oconee, the staff requested the applicant to assume Oconee was reduced to one-half its capability and compare this system cost estimate to that case where Oconee is operated at its rated capacity. As a result of this assumed restriction on the production model, the more efficient fossil units produce more energy, but are not sufficient to replace all of the reduced output of Oconee. Thus, several additional units are called on to meet demand.

The applicant ran the computer model for the period of June 1979 to December 1980. The cost of restricting Oconee to one-half the rated capacity is \$168 million for this period.

Other amounts of derating would affect cost, but probably not linearly. For example, a lower derating would not require as much production from high-cost units. The cost estimates provided, however, show the general magnitude of costs of operating Oconee at a lower capacity.

The staff has examined the computer runs provided by the applicant and finds the data and results comparable to other information. We monitor trade and information from applicant/licensees on a need basis, and perform economic-engineering studies. We therefore conclude that \$168 million is a reasonable

<sup>b/</sup> In addition to cost impacts of changing the loading order, DPC, in response to a staff question notes that the Oconee units are not designed for routine cycling operation. Potentially shortened life of the turbine rotor due to transient thermal conditions, and the availability of Xenon in the reactor core due to cyclical operation are problems of cycling operation.

cost estimate for a derating to 50% capacity for the period June 1979 to December 1980.

The applicant was also asked to provide the cost of completely shutting down Oconee for a year, so that the staff could better understand these impacts. The same production costing model was used to supply this response. For the period June 3, 1979 to May 31, 1980, the increase in cost to the system is \$258 million which consists of increase in variable operating and maintenance costs, increased fuel costs, and increase in emergency power cost. The staff has compared this estimate to other available information and believes it is reasonable.

In addition to increased operating costs, including purchased power, the applicant may have to contract for capacity to replace Oconee if it is derated or shut down. This is estimated to be between \$3.25 and \$3.75 per kW-month. This cost is comparable to other information. This cost would be about \$4.5 million per month if Oconee is derated to one-half of capacity and \$9 million if completely shutdown. If the firm purchase of capacity is over a long term basis, i.e., one year or longer, rather than a monthly basis, then capacity purchase costs would occur each month, not just the months when insufficient capacity is available on the applicant's system. Thus, if they are unable to contract for capacity for less than a year, at several times during the year DPC would be buying capacity it may not need.

We have considered NRDC Contention 3a and 3b and conclude it would be unreasonable to operate Oconee in the manner suggested from an economic viewpoint.

REFERENCES

1. Coal and Nuclear: A Comparison of the Cost of Generating Baseload Electricity by Region, by J. O. Roberts, S. M. Davis, and D. A. Nash, U. S. Nuclear Regulatory Commission, NUREG-0480, December 1978.
2. Cost and Quality of Fuels for Electric Utility Plants, U. S. Department of Energy, DOE/EIH-0075/12(78), April 1979.
3. Official Correspondence from Maine Yankee Atomic Power Co. to Mr. Paul Fine, U. S. Nuclear Regulatory Commission, ONRR, March 22, 1979
4. Steam-Electric Plant Construction Cost and Annual Production Expenses, 1976, U. S. Department of Energy, EIA, August 1978.
5. Steam-Electric Generating Plant Statistics, (preliminary copy), U. S. Department of Energy/EIA, December 31, 1978.
6. Operating Units Status Report, Licensed Operating Reactors, (Grey Book), U. S. Nuclear Regulatory Commission, U. S. Department of Energy, NUREG-0200, January 1979 and April 1979.
7. Southeastern Electric Reliability Council, Coordinated Bulk Power Supply Program, 1979-1998, April 1, 1979.

STATEMENT OF QUALIFICATIONS OF DARREL A. NASH

I am employed as a Senior Cost-Benefit Specialist with the Cost-Benefit Analysis Branch, Division of Site Safety and Environmental Analysis, Office of Nuclear Reactor Regulation, located in Bethesda, Maryland. My educational and professional qualifications are set forth below.

Education

|                              |                                |
|------------------------------|--------------------------------|
| B.S. Agricultural Economics  | Colorado State University 1958 |
| M.S. Agricultural Economics  | Montana State University 1960  |
| Ph.D. Agricultural Economics | University of Illinois 1964    |

In addition, I have taken advanced courses in econometrics. My formal educational program has encompassed, and emphasized, studies in micro-economics, mathematics, and statistics as they relate to land and water resources and agricultural production.

Experience

I joined the Regulatory Staff of the Atomic Energy Commission in August 1973, being assigned to the Cost-Benefit Analysis Branch. As a Senior Analyst, I am responsible for reviewing and analyzing environmental reports and preparing cost-benefit portions of environmental statements. I am responsible for developing the criteria for analysis of alternative sites, alternative fuels and alternative cooling systems to be used in environmental statements. In addition, I conduct generic economic research on topics related to environmental impacts of nuclear power plants. I prepare testimony and participate in three to five environmental hearings per year regarding cost-benefit analysis and need for

power, in particular, cost analysis of alternative fuels, land use impacts of power plant siting, recreational impacts of power plant siting, regional income impacts, and the need for the facility.

Other activities include review and propose revisions of Regulatory Guides, in particular Regulatory Guide 4.2 which pertains to preparation of Environmental Reports.

From April 1965 to August 1973, I was with the National Oceanic and Atmospheric Administration in the U. S. Department of Commerce and its predecessor agencies. This position began with responsibility for research and research supervision in fishery marketing, including estimating consumer demand for fishery products and distribution of fishery products. A major project was to conduct a cost-benefit analysis of preservation of fishery products by low level ionizing radiation. Consumer and marketing studies culminated in a study making long-range projections of the demand and supply of fishery products on a worldwide basis.

During the later period of this appointment, my primary responsibility was in fishery management wherein social, economic, and biological studies were conducted to determine needed institutional changes to better allocate the utilization of fishery resources. Studies were also supervised on the economic conditions of fishing vessel owners and environmental analysis of marine fisheries habitats.

Specialized assignments in the NOAA position included work on establishing the PPBS system for Federal commercial fisheries programs.

Also, under loan to the U. S. Agency for International Development (AID), I have traveled to eight countries to evaluate potential for producing and distributing fish protein concentrate within these countries.

During 1964 and 1965, I was employed as a resource economist by the Bureau of Land Management in the U. S. Department of Interior and developed models for determining optimum multiple use of public lands for such activities as grazing, watershed management, recreation, and forestry. My duties there emphasized development and analysis of the economic consequences of different land uses.

From 1969 to 1973, I had an appointment as Visiting Assistant Professor in the Agricultural and Resource Economics Department at the University of Maryland and have taught graduate courses in Industrial Organization and Economics of Marketing in that Department.

I have authored or coauthored about 15 publications, more important areas being (1) optimum land use patterns, (2) cost-benefit analyses of food preservation by low level ionized radiation, (3) long-range projections of demand and supply of fishery products, and (4) demographic patterns of fishery product purchases. Numerous unpublished papers have also been written on these and related areas such as cost-benefit analysis of public land use and analyses of financial assistance programs for marine fishing vessels.

I am a member of the American Agricultural Economics Association and the Society of Government Economists.





Contention #5 Applicant overstates the need for action at this time by using the one-core discharge capacity reserve standard as if it were a requirement where in fact it is not a requirement of NRC regulations.

- (a) Either Applicant should be bound to comply with the one-core discharge capacity standard [as a license condition] or it should have to demonstrate on a cost/benefit basis that holding that capability is more valuable than the costs of shipment off-site of one core of spent fuel (Tr. 85-127).

There is no regulatory requirement for any particular spent fuel storage capacity nor is the regulatory staff aware of any compelling safety basis for requiring maintenance of a full core discharge capability.

The lack of a spent fuel storage capability can be costly in terms of extended reactor outage time, however, the benefits from prudent reactor plant design, in availability of the facility and reduction of man-rem exposures for inspections and repairs, are self evident. Therefore, the licensing staff plans to continue its past practice of pointing out these benefits to applicants and licensees. This testimony is based in part on general conclusions reached as a result of numerous spent fuel storage reviews and associated evaluations of alternatives. The specific alternatives and conclusions relative to the proposed shipment of spent fuel from the Oconee station to McGuire will be covered by others.

Historically, power reactor facilities have been designed and built with storage pools for irradiated fuel assemblies that could store the fuel discharged during the refueling, plus some additional space.

Generally, utilities have followed the practice of providing additional space for a full core, so that if a need to unload the core should occur, space would be available to permit immediate unloading. The staff has endorsed and encouraged this design philosophy. Our present practice, as described in the Standard Review Plan is to require applicants to state the basis for the spent fuel storage capacity provided in the design. (The Standard Review Plan is guidance for the staff which presents a well defined base for reviewers and a statement of regulatory policy.) For example, the safety analysis reports for some recent light water reactor applications state that the storage space provided is consistent with the maximum number of spent fuel assemblies unloaded from the core, during the refueling cycle, plus the fuel contained in a full core load (e.g., 1-1/3 core for a single unit plant and 1-2/3 core for a dual unit facility). The staff believes the above is an appropriate basis for selecting design storage capacity, and has informed applicants to this effect, but we have no guides or regulations that require any specific basis for selecting design capacity.

The Oconee station consists of 3 reactors. Two reactors share one pool and the third reactor has a separate pool. The shared pool had an original capacity slightly greater than 1 2/3 cores and single unit pool had a capacity slightly less than 1 1/2 cores. This was consistent with the then prevailing design practice. Since then the license has

requested and received approval to increase the storage capacity of the single unit pool to about 2.7 cores. Therefore the license has a total station storage capacity for the three units of about 4.5 cores. Presently there is available storage for 265 fuel assemblies; each of the three units has a core that consists of 177 fuel assemblies.

The staff has previously (1975) considered the possible need for establishing requirements for design capacity of spent fuel storage pools and for the maintenance of available space sufficient to permit storage of a full reactor core in the event the need should arise to unload the reactor (full core reserve). The staff considered various postulated situations that illustrate the benefits of being able to completely unload the reactor, such as the need to perform repairs or modifications (e.g. repair pipe cracks or replace steam generator tubes) or to reduce the accumulated man-rem dose to workers during certain maintenance or inspection activities ( e.g. inspect the reactor belt-line welds or reactor fuel). In all cases, however, the conditions that might require unloading the core could be permitted to exist and the unloading put off or delayed until space was made available by shipping stored fuel to some other location. No postulated event or safety consideration required immediate core unloading. The core cooling system with its redundancy and the

reactor vessel with its integrity provide assurance that the reactor vessel is a safe location in which to keep fuel already in the core for an indefinite period, following shutdown of the reactor.

None of the postulated situations presented any compelling safety basis for requiring maintenance of a full core reserve; however, lack of such capability can be costly in terms of extended outage time. The benefits from prudent design, in availability of the facility and reduction of man-rem exposures for inspections and repairs, are self evident. Therefore, the licensing staff points out these benefits to applicants and licensees, but has not established a basis for imposing a requirement to maintain full core reserve fuel storage capability.

Licensees recognize the benefits of being able to unload the reactor but not all licensees have taken steps to assure that a full core reserve is available. Possibly because there is no requirement for a particular spent fuel storage capability, the steps taken by licensees have not all been the same. In the past some utilities requested increases in storage capacity of only a fraction of a core although most requested increases were for more than one core of storage capability.. Today only 2 reactor stations, with one or more reactors, are operating without a full core reserve (FCR). But during the past four years, numerous other stations also have operated without a FCR. These actions show that not all licensees believe that full core reserve is necessary.

The contention, simply stated, would require a licensee to demonstrate that it is better to rely on a full core storage capability than to rely on shipment of spent fuel. Fuel may have to be discharged from the reactor to permit reactor vessel inspections or certain repairs. The contention presupposes that shipment of spent fuel to another location is a viable option. In the particular case involving Duke Power, the McGuire spent fuel storage pool does exist and it could be used to receive spent fuel from the Oconee station. In most proposals reviewed to date the option of shipping spent fuel between reactor sites did not exist; therefore, increasing the on-site storage pool capacity was the proposed option. (The NRC assessment of case specific alternatives available to Duke Power is discussed in the Environmental Impact Appraisal and Staff affidavits with respect to Natural Resources Defense Council Contention No. 3 on Alternatives and Carolina Environmental Study Group and Carolina Action Contention No. 1.) Assessments of cost benefit for those proposals that have been approved to date show that shutting down the plant is less desirable than either increasing on-site storage capability or shipping spent fuel to another reactor pool with space.

The Commission stated on September 10, 1975, in the Federal Register that approvals for pool modifications can be granted, pending issuance of the generic environmental impact statement, provided that they are consistent with consideration of five specific factors. One of the

factors specifically covers the need for the increased storage capability. It and other factors have been considered in an Environmental Impact Appraisal issued by the NRC in support of every licensing action on a storage pool modification. We have approved on a case-by-case basis, approximately 40 proposals to increase on-site spent fuel storage capacity. In these cases it was found that the cost associated with the reactor being unable to operate for a short time because of a lack of storage capability is far greater than either increasing on-site storage capability or shipping fuel to another site for storage if it were available.

NRC has been authorizing on-site spent fuel storage expansive well before the necessity to preclude a reactor shutdown. Our reasons include: (1) modifications to increase spent fuel storage capability can be done with less personnel exposure to radiation when the pool has no spent fuel in it or less than a full complement of spent fuel and (2) regardless of the amount of storage available the added storage capability will not be used until the need for storage exists - storage capability does not cause a utility to generate either a larger quantity of spent fuel or spent fuel at a faster rate just to fill the pool. Modifications to on-site pool storage capability can be most easily done before spent fuel has been discharged from the reactor to the pool. All work can be done with the pool dry since water does not need to be in the pool.

When spent fuel is in the pool, water is required for shielding and cooling. Keeping the amount of spent fuel in the pool to a minimum reduces the radiation field strength and increases the distance between the workers and the spent fuel. It may also reduce the amount of fuel handling, simplify the modification procedures and thereby minimize the time that personnel are exposed.

Thus, although there is no regulatory requirement for any particular spent fuel storage capacity, providing increased storage capability does not increase the rate at which spent fuel is discharged from the reactor to the pool, but will instead provide the licensee with operational flexibility which the NRC staff encourages. NRC will review each proposed option and give approval, when necessary and appropriate.

I hereby certify that the above statements are true and accurate to the best of my knowledge and belief.

*T. Derrell Carter, Jr.*  
\_\_\_\_\_  
T. Derrell Carter, Jr.

Subscribed and sworn to  
before me this 10 day of  
July, 1979.

*Michael D. Hoff*  
Notary Public  
*My Commission expires July 1, 1982.*



PROFESSIONAL QUALIFICATIONS

OF

T. JERRELL CARTER, JR.

I serve as technical expert in the nuclear engineering field as advisor and assistant to the Assistant Director for Engineering and Projects, Division of Operating Reactors. I coordinate technical reviews within the division. As such I have been involved with spent fuel storage increases since 1975. I have authored a paper on spent fuel storage given at the 9th Annual National Conference on Radiation Control in 1977 and another updated paper to be given to the June 1979 Meeting of the American Nuclear Society. I have also participated in a joint NRC/IAEA Seminar on Spent Fuel Storage in 1978.

Prior to coming to the Commission in 1969, I was with Atomics International in California for 11 years. I worked as a process design engineer for a power reactor. As such I performed safety studies in support of a Safety Analysis Report, evaluated system designs and prepared system design descriptions and equipment specifications. I also designed and specified equipment for experimental loops installed in domestic and Canadian reactors. I assisted loop operation and evaluated the performance. In addition, two years were spent at a reactor site during preoperational testing and initial operation of a power reactor. I was responsible for evaluating system performance and designing modifications that would improve performance. Included were spent fuel storage pool systems including water purification.

I received a Bachelor of Arts from Amherst College and a Bachelor of Science in Chemical Engineering from Massachusetts Insititute of Technology in 1957 and a Master of Science in Chemical Engineering from Massachusetts Institute of Technology in 1958. My master's degree included work at the MIT Practice School in Oak Ridge, Tennessee. I am a Registered Professional Engineer in Nuclear Engineering in the State of California.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
DUKE POWER COMPANY )  
(Amendment to Materials License )  
SNM-1773 for Oconee Nuclear Station )  
Spent Fuel Transportation and Storage )  
at McGuire Nuclear Station) )

Affidavit of Brett S. Spitalny

I, Brett S. Spitalny, being duly sworn to depose and state:

1. I am the Project Manager for the McGuire/Oconee spent fuel transportation and storage proposal, Office of Nuclear Material Safety and Safeguards.

2. I have prepared a statement of professional qualifications which is attached to this affidavit.

3. This affidavit addresses Natural Resources Defense Council (NRDC) Contention 2 which reads as follows:

The proposed action is a major federal action significantly affecting the quality of the human environment and cannot be acted upon until preparation of a final environmental impact statement.

The contention suggests that the staff should have prepared an Environmental Impact Statement in lieu of an Environmental Impact Appraisal (EIA). The natural Resources Defense Council (NRDC) bases for this statement is that the proposed action is a major federal action significantly affecting the quality of the human environment. The contention does not

suggest, however, those areas of concern in which the EIA falls short of its intent, i.e., of evaluating the proposed action to allow a determination to be made with respect to significant impacts, if any, of the proposed action.

Resolution of NRDC contention 2, therefore, is necessarily ~~dependent~~ directly on the resolution of NRDC contentions 3, 4, 5 and 6. (See NRDC response of April 16, 1979, P. 14, to applicant's interrogatory No. 51 of March 28, 1979.) My affidavit and the affidavits of R. Daniel Glenn, Dr. M. Parsont, Dr. J. Nehemias and T. Jerrell Carter as well as the Environmental Impact Appraisal (EIA) (December, 1978) show that (1) the environmental impacts are negligibly small, and, therefore insignificant, and (2) there are no preferred alternatives to the applicant's request to ship Oconee spent fuel to McGuire for storage if alternatives to the proposed action are evaluated. I adopt the material set forth in the EIA pertinent to the NRDC contentions 3, 4, 5 and 6\* as part of my testimony and affidavit in this case.

Although Duke Power Company has applied for an amendment to modify the Oconee spent fuel capacity by reracking, modification of the existing Oconee spent fuel pools to provide additional storage capacity is less preferred on an economic basis. Modification of the Oconee pool is roughly comparable to the request to transship Oconee fuel to McGuire

\* The motion for summary disposition is not being sought with respect to contention 6. Further explanation will be supplied at the upcoming hearing, reaffirming the staff's conclusion in the EIA that related impacts are not significant.

with respect to normal radiation exposure, although neither activity has other than a negligibly small environmental impact including the impacts of radiation dose. Transshipment and storage of Ocone fuel at McGuire has negligible or no measureable environmental impacts, and certainly no significant environmental impacts.

As the NRC Project Manager of this licensing action, I have directed and taken part in the preparation of the Environmental Impact Appraisal (EIA) in support of the staff's negative declaration (43 FR 61057). The staff's EIA has considered all facts that are material to this issue and concludes there are no significant impacts from the proposed action.

I have prepared testimony with respect to NRDC Contention 3, alternatives and CESC Contention 1, alternatives. My affidavits, those of other staff affiants which I have examined, and the EIA clearly demonstrate that the proposed action will result in negligibly small and, therefore, insignificant impacts with respect to air, aquatic, and terrestrial environs. Impacts from occupational exposure and the dose to the general public are negligibly small and therefore, insignificant. The affidavits of Messrs. Hodge, Glenn and Lake confirm that the burden of radiation dose as a result of routine and non-routine operations (CESG and CA Contention 2) are also negligibly small, and, therefore, insignificant.

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In addition, the Natural Resources Defense Council (NRDC) in its response to discovery requests of the staff and of the applicant, has failed to point out substantively where the Environmental Impact Appraisal (EIA) is in error, or if those impacts noted in the EIA are other than negligibly small, and, therefore, insignificant.

Based on my analysis, which has considered the EIA and the evidence offered in evaluation of the factors described in NRDC Contentions 3, 4, 5 and 6, I have determined with respect to NRDC Contention 2 that the environmental impacts from the proposed action will be insignificant and, therefore, constitutes an insignificant effect on the quality of the human environment.

I hereby certify that the above statements are true and accurate to the best of my belief.

Brett S. Spitalny  
Brett S. Spitalny

Subscribed and sworn to  
before me this 11<sup>th</sup> day  
of May, 1979

Madeline C. Sides  
Notary Public

My Commission expires July 1, 1982

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

DUKE POWER COMPANY

(Amendment to Materials License  
SNM-1773 for Oconee Nuclear Station  
Spent Fuel Transportation and Storage  
at McGuire Nuclear Station

Docket No. 70-2623

Testimony of Brett S. Spitalny  
and R. Daniel Glenn

This testimony addresses Carolina Environmental Study Group  
(CESG) Contention 1 and Carolina Action Contention 1 which reads as follows:

Shipment of Oconee spent fuel to McGuire for storage is  
unacceptable as compared to other alternatives:

- a. Modification of the existing Oconee spent fuel pools  
to provide additional storage capacity.
- b. Construction of a new separate spent fuel storage  
facility at the Oconee site.
- c. Construction of a new and separate spent fuel storage  
facility away from the Oconee site, but other than McGuire.

The contention by Carolina Environmental Study Group (CESG) and  
Carolina Action (CA) suggests that the staff did not adequately examine  
the alternatives to the proposed action. The contention focuses on two



options available to Duke Power: 1) the modification of the existing pools at Oconee, and 2) the construction of a new facility either on or away from the Oconee site. We adopt as part of the basis for our affidavit, the analysis contained in the Environmental Impact Appraisal (EIA), (December, 1978).

The first alternative, that of modification of the existing pool may be accomplished by three means, a) physical expansion of the pool, b) reracking with high density stainless steel racks, and c) reracking with neutron absorbing materials (poison racks).

The physical expansion of the Oconee pools is not possible (EIA p. 52). The existing pools, both the Unit 1 and 2 shared pool and the Unit 3 pool, were not constructed with the intent of expansion and therefore there is no capability to breach the integrity of the pools. Since the Oconee 1 and 2, and Oconee 3 pools contain spent fuel, such an action is not feasible (EIA p. 52).

Another means of increasing capacity in the existing pools is to install high density stainless steel racks. Again, as evaluated in the staff's EIA, this action was one of two viable alternatives available to the applicant (EIA p. 52). Experience had indicated that the time required to design, contract and procure the racks coupled with the time to license the action, made this alternative less attractive than its counterpart, transshipment (EIA, Chapter 9). Subsequently however, the applicant has requested, and received, an expedited delivery date from Combustion Engineering for the acquisition of these racks.

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On February 2, 1979, Duke Power submitted an application to the NRC staff for the approval to install high density stainless steel racks in the Oconee Units 1 and 2 shared pool. The staff is trying to accommodate the expedited schedule requested by Duke and provide Duke Power with a completed review by early June 1979, as presently scheduled. This licensing action (reracking) will increase the storage capacity of the Oconee 1 and 2 basin from 336 to 750 assemblies. This increase of 414 assemblies will provide some relief to the immediate problem of a spent fuel storage shortage capacity at Oconee. However, it will not solve Duke Power Company's fuel storage problem. An additional measure is still needed. Duke has indicated that it still envisions transshipment as the preferable alternative (Duke Power Application to rerack Oconee 1 and 2, February 2, 1979). The staff has indicated that both alternatives, transshipment or reracking, were feasible, and that neither alternative imposed any undue risk or significant impact on the quality of the human environment.

As evidenced by the application of February 2, 1979 from Duke Power to rerack the Oconee Units 1 and 2 spent fuel pool, the consideration of reracking as an alternative to transshipment has become an additional measure actively being pursued by the applicant to ameliorate the shortage of spent fuel capacity.

The last option open to Duke for modifying the pools, is one of incorporating neutron absorbing materials (poison racks) to increase

the density of assemblies. This alternative was considered in detail in the Natural Resources Defense Council (NRDC) Contention 3c and 3d (B. Spitalny and R. Glenn testimony).

In general, the staff would agree that the use of poison racks might be considered a reasonable means of ameliorating the shortfall of storage space, but in this situation is not considered cost-effective. Due to the timing required in procuring and licensing this option and assuming that Duke does not install stainless steel racks as presently being pursued, the shipment of spent fuel will still be required to accommodate the installation of poison racks. Assuming Duke does install the stainless steel racks, ample space will exist for their installation, however, the added costs related to this licensing action (dollars and man-rem) must be added to the costs for poison racks. The method of contending with the shortage of storage space at Oconee by transshipment and reracking as proposed by the applicant, has been shown to be cost-effective and results in negligibly small, and therefore insignificant impacts on the quality of the human environment.

The alternative of constructing a new and separate storage facility has also been addressed by the contention as being inadequately evaluated. The economic consequences of constructing a new and separate storage facility remain constant regardless of whether the site is at Oconee, or at some other location. Speaking independently of site selection, the construction of an Independent Spent Fuel Storage Installation (ISFSI) by the applicant was evaluated in this licensing action's Environmental Impact Appraisal (EIA pp. 50-52). That evaluation concluded that the delays associated with licensing, construction and testing of such a facility would not allow completion in time to solve the immediate storage needs at Oconee. Additionally,

the financial burden potentially passed on to the ratepayers is of proportion as not to be overlooked as an incidental cost. In comparison, transshipment to McGuire and reracking Oconee Basin 1 and 2 with stainless steel racks would meet these immediate storage needs.

The installation of poison racks, would, however, allow sufficient time to construct a separate facility before Oconee again gets to a point that spent fuel storage space would be a problem. This alternative, assuming no prior (stainless steel) reracking, will not preclude the shipment of fuel however, and subsequently does not result in an option advantageous to the one chosen by the applicant. Assuming Duke does rerack with stainless steel racks, will add to the ultimate costs, as mentioned earlier, of installing poison racks. (Spitalny and Glenn testimony, NRDC 3c & d)

Use of an onsite, but separate spent fuel storage installation would not significantly reduce the total dose received from similar shipments to offsite storage installations such as McGuire Nuclear Station. The transshipment of one spent fuel assembly from Oconee to McGuire is estimated to result in an occupational dose from 0.1 to 0.25 man-rem. This total, due to loading and unloading of the shipping cask makes up approximately 75% of the overall dose. Since an onsite storage installation at Oconee could not be connected to the existing basins, it would still be necessary to make similar transfers using a shipping cask. (Spitalny and Glenn testimony, NRDC 3c and d, and NRDC 4).

Recent studies by utilities and confirmed by the Department of Energy have indicated that costs for constructing and operating a facility of this type range upward to approximately \$30,000 per assembly. This is sharply contrasted by the approximate cost of shipment at \$2,000 per assembly. (EIA, Table 10-1, P.58; DOE/EIS-0041-D, p.II-27.) To assure adequate spent fuel storage capacity for its operating reactors, the applicant has increased the size of spent fuel storage basins at those reactors it has presently under construction.

The potentially small reduction of exposure achievable by building separate storage facilities at Oconee coupled with the large additional costs involved do not support construction of such facilities as in the best interest of the applicant or its ratepayers at this time. (EIA pp. 30-52; Spitalny and Glenn affidavit, NRDC 3c and d.)

In regard to a new and separate facility at a site other than Oconee or McGuire Nuclear Stations, little or nothing is to be gained over transshipment to McGuire. In fact, the proposal suggested in CESG's and CA's Contention 1(c) would result in requiring the shipment of spent fuel in a manner identical to that of shipping to McGuire. The intervenors have suggested an option which they oppose as presented in their Contention 2. This action could most likely also result in greater environmental impacts due to construction of such a facility offsite and the development of land which presumably would have to be acquired by Duke Power. This would result most likely in additional increased costs to the utility and ratepayers. An indirect cost would also be incurred

in that the construction of a new facility fails to take advantage of economic commitments already made by the applicant.

Duke's proposal, on the other hand, takes advantage of storage capacity at McGuire for which monetary commitments have been made.

In summary, for the foregoing reasons, we have determined that the proposal to transship is an environmentally sound option, with negligibly small, and, therefore insignificant impacts. In general, the use of neutron absorbing (poison) racks is an accepted practice. However, in this case it may not be the optimum alternative.

Additionally, the construction of a new facility either on or away from the Oconee site has been shown, like poison racks, to not be cost-effective. Although we find these alternatives technologically feasible, they are not preferred alternatives when compared to the proposed action to transship and store Oconee spent fuel at McGuire.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )

DUKE POWER COMPANY )

(Amendment to Materials License  
SNM-1773 for Oconee Nuclear Station  
Spent Fuel Transportation and Storage  
at McGuire Nuclear Station) )

Docket No. 70-2623

Affidavit of Brett S. Spitalny

I, Brett S. Spitalny, being duly sworn to depose and state:

1. I am the Project Manager for the McGuire/Oconee spent fuel transportation and storage proposal, Office of Nuclear Material Safety and Safeguards.

2. I have prepared a statement of professional qualifications which is attached to this affidavit.

3 This affidavit addresses Carolina Environmental Study Group (CESG) Contention 3 and Carolina Action (CA) Contention 3 (CESG and CA Contention 3) which reads as follows:

Factors set forth in items 1 [CESG-Contention 1 & Carolina Action-Contention 1] and 2 [CESG-Contention 2 & Carolina Action-Contention 2] above require the preparation of an Environmental Impact Statement because the proposed action is a major federal action of the Commission significantly affecting the quality of the human environment.

CESG and CA Contention 3 states that the Staff should have prepared an Environmental Impact Statement in lieu of an Environmental Impact Appraisal because the proposed action will have a significant adverse effect

on the quality of the human environment. CESG's and CA's stated basis is that the impacts from transportation will impose an unacceptable burden of radiation dose to the public as a result of routine and non-routine operation, and that the Staff has not properly evaluated specified alternatives to the proposed action.

This affidavit further addresses CESG and CA Contention 3 with respect to the factors set forth in CESG Contention 1 and CA Contention 1 and whether those factors demonstrate that the proposed action is a major federal action of the Commission significantly affecting the quality of the human environment such that preparation of an environmental impact statement is required.

Resolution of this contention is necessarily dependent directly on the resolution of CESG Contention 1 and CA Contention 1. My affidavit and the affidavits of R. Daniel Glenn, Dr. M. Parsont, and Dr. J. Nehemias, as well as the Environmental Impact Appraisal (EIA (December, 1978) show (1) that the environmental impacts from the proposed action are negligibly small and therefore insignificant and, 2) that there are no preferred alternatives to the Applicant's request to ship Ocone spent fuel to McGuire for storage when compared to other alternatives. I adopt the material set forth in the EIA pertinent to the CESG Contentions 1 and 2 and CA Contentions 1 and 2 as part of my testimony and affidavit in this case.



Although Duke Power Company has applied for an amendment to modify the Oconee spent fuel capacity by re-racking, modification of the existing Oconee spent fuel pools to provide additional storage capacity is less preferred on an economic basis. Modification of the Oconee pool is roughly comparable to the request to transship Oconee fuel to McGuire with respect to radiation exposure from routine operations, although neither activity has other than a negligible environmental impact including the impacts of radiation dose.

Transshipment and storage of Oconee fuel at McGuire has negligible or no measureable environmental impact, and, therefore, certainly no significant environmental impact and far outweighs the construction of a new and separate spent fuel storage facility at or away from the Oconee site from a time, cost, and environmental impact standpoint. This conclusion is based on several factors.

The radiation doses from transshipment and storage at McGuire, although extremely low, would be comparable to transshipment to a new and separate spent fuel pool if constructed at the Oconee site. The economic costs of such a new, separate pool at the Oconee site would exceed many times the transshipment proposal. (EIA, p 49-59, EIA, Ch. 5) The time required to design, license and construct such a new, separate spent fuel facility exceeds the time available to Duke by a number of years. (EIA, pp 49-59) Construction of such a new, separate spent fuel facility at either the Oconee site or at another site other than the McGuire site most likely would result in greater environmental impacts from construction, where the transshipment

option has been shown to have negligibly small, and therefore, insignificant environmental impacts. Environmental impacts of such construction of a new, separate spent fuel pool facility at the Oconee site or at another site other than at McGuire, since the impacts of the proposed action are insignificant and construction of such a separate spent fuel pool is not a reasonable alternative, have not been, and are not required to be evaluated in this case other than in a general sense for purposes of this affidavit.

As the NRC Project Manager of this licensing action, I have directed and taken part in the preparation of the Environmental Impact Appraisal (EIA) in support of the Staff's negative declaration (43 FED. Reg. 61057). The Staff's EIA has considered all facts that are material to this issue and concludes there are no significant impacts from the proposed action.

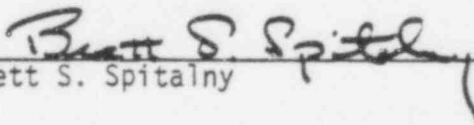
I have prepared testimony with respect to CESG Contention 1, alternatives, and CA Contention 1, alternatives. The EIA clearly demonstrates that the proposed action will result in negligible or insignificant impacts with respect to air, aquatic, and terrestrial environs. Impacts from occupational exposure and the dose to the general public are insignificant. (EIA, pp 29-32) The affidavits of Messrs. Hodge, Glenn and Lake confirm that the burden of radiation dose as a result of routine and non-routine operations (CESG and CA Contention 2) is also insignificant.

In addition, the Carolina Environmental Study Group (CESG) and Carolina Action (CA) have failed to point out where the Environmental Impact Appraisal (EIA) is in error, or how the matters described in the document constitute

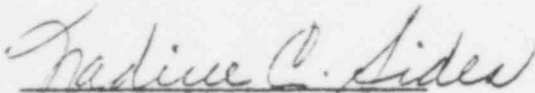
(1) significant impacts or (2) a major Federal action of proportions significantly affecting the quality of the human environment. Indeed, Carolina Action has failed to provide any supporting factual basis for its Contentions 1 and 2 in response to discovery requests of the parties.

Based on my analysis, which has considered the EIA and the evidence offered in evaluation of the factors described in CESG Contentions 1 and 2 and Carolina Action Contentions 1 and 2, I have determined with respect to CESG Contention 3 and CA Contention 3 that the impacts from the proposed action will be negligibly small, and therefore, insignificant; and, consequently, the proposed action to transport and store 300-270 day old Ocone spent fuel assemblies at McGuire constitutes an insignificant effect on the quality of the human environment.

I hereby certify that the above statements are true and correct to the best of my knowledge and belief.

  
Brett S. Spitalny

Subscribed and sworn to  
before me this 11<sup>TH</sup> day of May, 1979

  
Notary Public

My Commission expires: July 1, 1982.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )

DUKE POWER COMPANY )

(Amendment to Materials License )  
SNM-173 for Oconee Nuclear Station )  
Spent Fuel Transportation and Storage )  
at McGuire Nuclear Station) )

Docket No. 70-2623

TESTIMONY OF DARREL A. NASH

Question: Are there economic advantages to building an ISFSI as soon as possible to avoid the effects of future inflation?

Answer: If the facility is not needed at the time it is available, it is almost never advantageous to have it sooner than needed.

Question: What do you mean by the word "needed" as used in the context of this case?

Answer: The need is for a means of storing spent fuel as it is discharged from the three Oconee units. Need is not to be confused with alternative solutions available to meet that need.

Question: Are there exceptions to your statement that it is almost never advantageous to have a facility sooner than needed?

Answer: Yes, one case is where the time of need is highly uncertain and the consequences of not having the facility when needed are great.

Question: Why is it not economically advantageous to build a facility early?

Answer: The reason for this is that cost of money (i.e., in the case of an electrical utility this consists of bonds, preferred stocks and common stocks), almost always exceeds the rate of inflation. The

staff has found a nearly constant spread over more than 20 years between inflation and the weighted average cost of money to utilities of about 3 percentage points. Thus, investing now for the sole purpose of avoiding inflation later results in added costs.

Question: Why is the weighted cost of money to utilities important to the comparison?

Answer: In order to compare dollar costs which occur at different points in time, all costs must be adjusted (or, technically, discounted) to a common point in time because of the time value of money. A dollar is worth more now than a dollar to be received next year. The weighted cost of money is used as the discount rate. Future dollars discounted to the present time are called the present value of this sum of dollars.

Question: What is an example of the comparative costs of constructing a facility before it is needed versus constructing the same facility to be available at the time of need?

Answer: The following is an example where an ISFSI is built to become available in 4 or 5 years, assume 1983, versus delaying construction for 3 years. Using the cost of an ISFSI of \$51,750,000, the comparative costs are shown below.

The cost is increased by 8% to adjust it to a 1979 dollar, (assuming 8% inflation). The 1979 level cost is \$55,890,000. This is the cost of completion of a facility which is started in 1979 and completed in 1983. A facility started 3 years later and completed in 1986 would continue to inflate by 8% per year. However, to express the cost on a common time basis, the 1983 present value cost

must be used. The present value of \$55,890,000 using an 8% annual inflation and 11% discount rate for 3 years is \$51,479,750. Thus, in this example, there is about an 8.5% cost increase by constructing the ISFSI earlier than needed.

The delayed facility would always have a lower present value cost, regardless of the spread between the inflation rate and discount rate, as long as the interest rate is greater.

Question: Are there any other reasons why such an ISFSI should not be built before it is needed?

Answer: Yes, one reason, especially with the continually developing options for handling spent fuel, immediate construction may tend to foreclose technological development which could reduce cost or improve public health and safety. Secondly, at some future time NRC or other regulatory bodies may conclude that protection of the public health and safety requires modifications in the design or construction of spent fuel pools. These changes likely would be lower cost and more effective if done before design and construction rather than to retrofit. Finally, national policy may change at some time and spent fuel could be reprocessed, in which case the requirements for long term storage of spent fuel would diminish.

Question: What are the cost comparisons of building an ISFSI at Oconee versus other feasible means of handling Oconee spent fuel?

Answer: Since an ISFSI will only be available in 4 years, optimistically, the comparison should be made on that timeframe when the ISFSI can receive spent fuel. This will be from 1983 to 1995. By then the 2300 assembly

facility will be filled. The cost of this facility in the 1983 timeframe is \$55,890,000.

A feasible alternative is to transship spent fuel first to McGuire, 300 assemblies, and then to transship to Catawba and Perkins the remaining 2000 assemblies. The alternative presented below assumes poison racks are installed at Oconee in 1991 rather than shipping to Perkins. This is done for illustrative purposes only, as it is quite uncertain which set of feasible alternatives, may ultimately be selected.

Question: What are the costs of this alternative?

Answer: First of all there is a cost of \$2,500 per assembly to transship in 1978 \$. Using the 8% escalation rate, by 1983 this will have risen to \$3967 per assembly. The following analysis uses \$4000 per assembly in 1983 dollars. Thus in 1983 the transshipment of 177 assemblies at \$4000 per assembly results in a total cost of \$708,000. Each year thereafter, costs of transshipment are assumed to increase at 8% per year. Cost of installing poison racks is \$3650 per assembly. The following analysis assumes \$4000 per assembly. By 1991, at 8% escalation for 12 years, this cost reaches \$10,072.

Question: Are there other adjustments needed to obtain the cost comparison of the two alternatives?

Answer: Yes, as presented in the response to an earlier question, flows of costs over time must be expressed on a present value basis. The 1983 present value of transshipping/poison racks as described above is \$5,970,428 (approximately \$6 million). The 1983 present value cost of an ISFSI is over 9 times greater.

Question: What conclusions do you draw from this analysis?

Answer: Building an ISFSI for near term storage will be a much more expensive means of providing for the need to store Ocone spent fuel. This is partly because one option is a complete new facility, and the other is simply equipment modification and transportation costs, including costs of preparing the spent fuel for transportation. Another important reason is that the ISFSI requires a large cost at the beginning of the project and results in a large amount of unused space during several years, (13 years are required to fill the facility). The other option enables expenditures to be made much closer to the time of need, thus lowering present value costs. There are lower cost alternatives available which allow an indefinite delay in need for an ISFSI. There is a cost penalty in building a facility early just to avoid inflation when properly expressed on a present value basis.



Question: What are the cost comparisons of building an ISFSI at Oconee versus other feasible means of handling Oconee spent fuel?

Answer: Since an ISFSI will only be available in 4 years, optimistically, the comparison should be made on that timeframe when the ISFSI can receive spent fuel. This will be from 1983 to 1991. By then the 1,500 assembly facility will be filled. The cost of this facility in the 1983 timeframe is \$55,890,000. A feasible alternative is to transship spent fuel first to McGuire, 300 assemblies, and then to transship to Catawba and Perkins the remaining 1,200 assemblies. This is done for illustrative purposes only, as it is quite uncertain which set of feasible alternatives may ultimately be selected.

Question: What are the costs of this alternative?

Answer: First of all there is a cost of \$2,500 per assembly to transship in 1979 \$. Using the 8% escalation rate, by 1983 this will have risen to \$3,401 per assembly. The following analysis uses \$3,400 per assembly in 1983 \$. Thus in 1983 the transshipment of 177 assemblies at \$3,400 per assembly results in a total cost of \$601,800. Each year thereafter, costs of transshipment are assumed to increase at 8% per year.

Question: Are there other adjustments needed to obtain the cost comparison of the two alternatives?

Answer: Yes, as presented in the response to an earlier question, flows of costs over time must be expressed on a present value basis. The 1983 present value of transshipping/poison racks as described above is \$4,263,800 (approximately \$4 million). The 1983 present value cost of an ISFSI is nearly 14 times greater.



Question (1)

During the course of the hearing different cost estimates have been given for the construction of an Independent Spent Fuel Storage Installation (ISFSI). These estimates have ranged from a low of \$10,000/assembly to a high of \$34,500/assembly. Could you explain why there is a disparity in the numbers?

RESPONSE

The variations in cost are as a result of a difference in scope of the estimates, and not inconsistencies in the construction costs of the structure and equipment. For example, in the applicant's Exhibit # 7 (April 23, 1979 letter to the Staff), Duke Power Company's cost estimate for an ISFSI is \$51,750,000 (escalated to 1978 dollars at an escalation rate of 8%/year) for a 1500 assembly storage facility. This cost is broken down as follows:

|                                |                     |
|--------------------------------|---------------------|
| Structure                      | \$ 5,964,000        |
| Equipment                      | <u>\$17,106,000</u> |
| Subtotal                       | \$22,070,000        |
| Engineering Labor and Overhead | \$14,384,000        |
| Contingencies & Interest       | <u>\$14,235,000</u> |
|                                | \$51,689,000        |

Duke's cost estimate includes engineering, labor and overhead as well as contingencies and interest. Natural Resources Defense Council (NRDC), Exhibit # 10, (letter to Duke Power from Stone and Webster Engineering Corporation dated September 6, 1978), estimated \$29,000,000 to \$34,000,000 as the cost of the structure and equipment for a facility capable of storing 2300 PWR assemblies. This cost does not include engineering, labor, overhead nor contingencies and interest.

Comparing these two facilities, the total cost for structure and equipment of the Duke Facility is \$23,070,000 or \$15,380 per assembly, and the Stone Webster Facility ranges from \$29,000,000 to \$34,000,000 or \$12,600 to \$14,800 per assembly.

As shown by these costs, the estimates represent consistent cost figures. Additionally, the Environmental Impact Appraisal presents a cost figure as a result of independent studies done at an earlier date of \$10,000 per assembly. This figure escalated to 1978 costs at 8% per year results is a cost of \$12,600 per assembly. The DOE cost estimate, when put into proper perspective, results in similar expenditures. Therefore, it can be concluded that the Duke Power Company estimate is very much in line with the other estimates which have been provided.

Question (2)

Are there any other differences between Duke's proposed facility and the Stone and Webster design?

RESPONSE

Yes, the Duke Facility is a totally independent facility, while the Stone and Webster design is not a completely independent facility. The Stone and Webster design relies on an interface with the parent facility. The following systems are not included in the cost estimate: solid radwaste; liquid radwaste; fire protection; make-up water; electrical; communications and security. If the Stone and Webster design was a totally independent facility, cost would increase.

Question (3)

Would it be advantageous for Duke Power Company to physically expand the Oconee 3 Pool as suggested by Carolina Environmental Study Group (CESG)?

RESPONSE

The physical layout of the existing structure prohibits expansion of the pool in the manner posed by CESG. There is available space however, to proceed at a right angle to the existing pool.

The Oconee 3 Pool was not originally constructed with the capability for a later expansion. The pool does not have an expansion gate or canal which could be used for the transfer of assemblies to the new pool. Therefore, the movement of assemblies would have to be accomplished by the use of a cask as presently done between the Oconee 1 and 2 Pool and the Oconee 3 Pool.

The existing support systems needed to operate the Oconee 3 Pool have not been sized large enough to accommodate the increased capacity of spent fuel. That is the logic behind the need for a building to accommodate the new auxiliary systems, and their associated cost. The construction of such a pool would still require the majority of expense that would be required for a separate pool on the Oconee site. The only gain of such an undertaking would be the distance traveled by each spent fuel cask. However, a major drawback from this type of expansion would be the limited size of the pool, 650 assemblies, as testified to by S. Hager of Duke Power on Friday, June 22, 1979. (Tr. 1105 and 1181).

In light of the limited size and lack of substantial cost saving, there is no advantage for Duke Power to pursue an additional pool adjacent to the present Oconee C Pool.

Question (4a)

The remaining costs associated with Duke Power Company's estimate of \$34,500 per assembly, for the construction of an ISFSI, are attributed to engineering, labor and overhead, contingencies and interest. Would these costs be added to those cited by Stone and Webster?

RESPONSE

The Stone & Webster costs, as well as costs estimated by the other studies, were only for structure and equipment and did not include engineering, labor, overhead, contingencies or interest. These costs must be included to determine the capital cost of I.S.F.S.I.

Question (4b)

Based on your experience, do you have an opinion as to whether those costs cited by Duke Power Company are reasonable?

RESPONSE

Yes

Question (4c)

What is your opinion?

RESPONSE

Duke has the capability of being their own architect/engineer and constructor for this facility. Their charges for engineering, labor and overhead, contingencies, and interest are based on past experience from the construction of their own nuclear facilities. The Duke's estimate for contingency is 25%. This is not an unreasonable contingency for a new facility of this type.



STATEMENT OF PROFESSIONAL QUALIFICATIONS OF  
CLAYTON L. PITTIGLIO, JR.

Education

B.S. Civil Engineering University of Maryland 1969

Professional Engineering License  
State of Maryland P.E. 9249  
District of Columbia P.E. 6962

George Washington University - Master's of Engineering Administration Program,  
Current Registration - 2 courses for completion

Summary

My formal education has encompassed all phases of engineering and engineering management. The technical and management programs placed special emphasis on all phases of the nuclear and coal industry.

Experience

I have been employed by the U.S. Nuclear Regulatory Commission in Bethesda, Maryland as a Cost-Benefit Analyst since August 1978. During my employment, I have participated in review and evaluation of environmental impacts and economics of proposed nuclear generating facilities with respect to cost-benefit analysis. I have provided specialized input to NRC environmental impact statements pursuant to Appendix D, 10 CFR Part 51. I have evaluated construction cost estimates for modifications to new and existing facilities resulting from regulatory requirements along with supplying cost estimates for systems to mitigate adverse environmental impacts of nuclear generating facilities. I have worked in economic and environmental comparisons of alternate generating systems.

May 1970-August 1978

Prior to my experience with the U.S. Nuclear Regulatory Commission, I was employed by Bechtel Power Corporation for 8-1/2 years. During my employment with Bechtel, I worked on many different phases of design, construction cost estimating, bid evaluation, and construction of nuclear and coal generating facilities.

Generally, while with Bechtel Power Corporation, I was responsible for analysis, design, construction detail, and sequencing for the spent fuel building foundation for the SNUPPS - Standardized Nuclear Power Plant. My responsibilities on the SNUPPS project included review of the existing design, interface design for construction problems, including determination of appropriate material quantities for concrete and steel. I also coordinated with the designer of the exterior walls and designed the roof structure for the SNUPPS spent fuel building. Construction drawings for the SNUPPS project were issued by Bechtel Power Corporation. I signed the drawings as the responsible engineer.

From November 1, 1977 to August 7, 1978, while at Bechtel Power Corporation as a senior engineer, I was responsible for the analysis, seismic and non-seismic, as well as the design of support systems for electrical conduits which supply power for safe shut down during accident conditions. I was responsible for supplying construction input to the job site and for checking construction drawings.

From June 1, 1977 to November 1, 1977, as a senior engineer at Bechtel Power Corporation, I engaged in engineering foundation work on a nuclear fuel building massive concrete structure. I was directly responsible for seismic and structural design, detailing, scheduling, cost analysis, and erection sequence, as well as related management and administrative duties. (See above, para. 2 -- May 1970-August 1978).

From February 1, 1976 to June 1, 1977, as a senior engineer with Bechtel Power Corporation, I was responsible for the review of the existing design of an industrial nuclear turbine generator building for construction and engineering problems. After reviewing the design, I made the necessary changes and additions as required. Along with these duties, I reviewed and approved structural steel shop drawings.

From December 1, 1975 to June 1, 1976, as a senior engineer with Bechtel Power Corporation, I was responsible for neutron shielding modification work to an existing commercial nuclear power facility, undertaken by Bechtel. This project consisted of design modifications, construction scheduling, cost analysis, and preparation of specifications, and bid evaluations.

From April 1, 1975 to December 1, 1975, as a design engineer with Bechtel Power Corporation, I was responsible for preparation of analysis of construction modifications. I worked on cost estimates and construction schedules for those modifications. I was responsible for the entire civil engineering input for a bid package for construction of a power plant modification. Particular construction contract was awarded to Bechtel based on the bid package I had prepared.

From May 1, 1970 to April 1, 1975, as an engineer with Bechtel Power Corporation, I worked on various aspects of the analysis and design of both nuclear and conventional power plants.