ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:	DOCKET NO:
SHEARON HARRIS NUCLEAR	50-400-OL
POWER PLANT	50-401-OL

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the matter of:	
CAROLINA POWER AND LIGHT COMPANY and NORTH CAROLINA EASTERN MUNICIPAL POWER AGENCY	Docket Nos. 50-400-OL 50-401-OL
Shearon Harris Nuclear Power Plant, Units 1 and 2	

Bankruptcy Court,
500 Fayetteville Street Mall,
Raleigh, North Carolina.

Thursday, October 18, 1984.

The hearing in the above-entitled matter was reconvened, pursuant to adjournment, at 9:00 a.m.

BEFORE:

JAMES L. KELLEY, Esq., Chairman,
Atomic Safety and Licensing Board.

DR. JAMES H. CARPENTER, Member.

DR. GLENN O. BRIGHT, Member.

APPEARANCES:

(As heretofore noted.)

agb

C O N T E N T S

P R O C E E D I N G S

JUDGE KELLEY: Good morning.

Whereupon,

MARGARETA SERBANESCU

and

DAVID WATERS

resumed the stand and, having been previously duly sworn, were examined and testified further as follows:

JUDGE KELLEY: I have found a non sequitur in the transcript at page 4500, lines 16 through 19, which, in and of itself, is not surprising. The unfortunate thing is that it's attributed to me.

I don't want to take time on a small point but when I said yesterday, Mr. Eddleman,-- We were talking about time for cross and I walked you through a certain calculus and came to a bottom line, and my mistake was when I did the subtraction and then I took your statement that you were about half through, something in my head said you needed only 50 percent more time. What you meant was you needed twice as much time, so that that does not compute, and that is where the non sequitur is.

What I want to make clear though is I always keep track of time for cross, just to know where we have been and where we are going, and so forth. It is just a habit, whether we're under a time limit or not. And I don't want to

convey the impression that I've got some kind of magic sliderule up here that tells me, based on that, exactly when cross ought to be over. That is not the way that we do it.

When we feel that we should set a limit on it, we basically do it on the basis of what is in the prepared testimony, how long is it, how complicated is it, and how things have been going so far, if it is an ad hoc type limit that we impose well into the process of the cross.

It was by that kind of judgmental determination that we thought late yesterday you should finish this morning around 11:00, not by my subtracting this and adding that, and so forth, although I keep track of that, too, just to get a gross amount of time that's been spent.

We would like to just take a minute or two on the general subject of time limits to put you on notice -- not you, Mr. Eddleman, personally, but all the parties on notice that we're thinking about whether we might not come to a point pretty soon where we should consider some kind of a limit system.

We had not used any limits so far in the case and that has been because in our judgment it just hasn't been necessary, the case is moving along pretty well.

We are beginning to think as we look at this case in front of us and the time in front of us that some sort of system of limits might be advisable when we look, for example,

at the next contention which has all these different panels, and other contentions stretching out over a period of two or three weeks from now perhaps.

We also think that in general when we are operating under a time limit system of some sort, it tends to improve the case. It tends to improve the cross, and not just the cross. But we're not speaking just of the Intervenors' cross, we are speaking of everybody's time except for the Board's, and we have allowed some time for Board questions, too, time for redirect, time for Staff questions, and the like.

There are basically two different kinds of time limit approaches one can take. One is a purely ad hoc case-by-case sort of thing such as we're doing this morning on this particular panel. We haven't had prior time limits and we don't have one for the next panel, and we don't plan to try to figure one out in advance.

There again we simply look at the particular testimony that is involved, the exhibits that are involved, and make a judgment based typically on how the case has gone so far. I have never been in a case where we start to do these things right off the bat. It is usually done somewhere toward well into the middle of the case when we try to do this.

Apart from an ad hoc system -- and this is something that I'll ask you all to think about -- it is quite feasible to adopt a series of time limits for a series of

witnesses, a series of panels of witnesses, again including not just Intervenor cross, although under the system we have that inherently takes the most time, but questioning by others.

That kind of approach can amount to a schedule for bringing the whole case to a conclusion. In that connection we will plan to return to this topic the first of next week, on Tuesday. That will give us the benefit of this contention and some segment of Number 9, which I think is the one that we are thinking about most, with all those different panels coming up, and talk more about whether we ought to take such an approach.

Let me just give an example.

When we say a time limit we do not mean any rigid time which says at eleven o'clock today you will finish. It isn't that rigid. There is always a possibility that a party or Counsel questioning on a particular contention can run out of initially allotted time and make some brief good-cause showing why more time ought to be granted. And those are frequently, in my experience, granted to some point.

So there is sort of an escape valve at the end if we think the cross has gone pretty expeditiously and there really is a basis for allotting more time.

Another approach that seems to work pretty well, if you have a series of allocations of time, let's say five

panels, -- I'll just give you an example -- five panels, one day each, to include all questioning, maybe two-thirds of the time for Intervenor cross. You can also authorize a party to bank their time, so to speak, whereby if you have been given a half a day on Panel A and a half a day on Panel B, if you are really much more interested in Panel B than Panel A, you can spend an hour on Panel A and four or five hours on Panel B, as long as the aggregate time works out.

That is just another example of the kind of flexibility that we might build into any system that we decide to adopt.

I will mention one other thing. There is a discussion of this general area of time limits on examination in the Catawba decision of last June 22nd, and I even had some copies of that that I brought to the management hearing and I forgot to bring any down here. I can bring you the relevant section, Mr. Eddleman. It is just a few pages I'm talking about, and you can look that over.

But I'll mention it to the other parties. You will see it next Monday and have a chance to look at it. It is on page 10 or somewhere in there, three or four pages which go into the practicalities and also that Board's view on its authority to impose time limits at all.

You won't find much in the way of Appeal Board authority sustaining this. It is our view that we do have

the authority emanating from a couple of NRC rules and also the NRC policy statement where we are enjoined by the Commission to bring these cases along and finish them in a timely manner. As this is applied to hearings, if you can't control the time for questioning, you really can't control anything, and that's what the hearing is all about. But I won't elaborate on that beyond just alluding to it.

So I think we can pass on from that. We wanted to mention it this morning and we will, as I mentioned a minute ago, bring up the topic again the first thing next week and get the parties' views on whether we ought to do something along that line and if so, what.

At the end of yesterday's session we had had a question or maybe questions from Mr. Eddleman to the panel which went generally to the question of cost, cost of systems, and whether cost influenced their analyses or their decisions on what to recommend. And we had objections from both the Applicants and the Staff to those questions on the ground that cost was not relevant.

And the basic argument is that we are here to litigate safety and either the systems that are being proposed here are safe or they are not safe, and the question is whether they meet NRC acceptance criteria, NRC standards, and not how much they cost.

And Mr. Eddleman argued that there was a

relationship, that people might take into account cost and that might cause them to hedge on recommendations and lead toward a cheaper system if that were an option; assuming that you could get two systems that could meet NRC criteria, you might lean toward the cheaper one, all things considered.

We have considered your arguments and we are going to sustain the objections to those questions in that general line of questioning, the cost line.

We believe that the point that it is NRC standards that are at stake and whether or not these systems meet them that really count, and that it is at least largely irrelevant how much they cost.

I might just add one other consideration:

You can make an argument that cost bears on decisions and that bears on safety. I am not saying that there isn't anything to it. It is a matter of commonsense and experience. Perhaps that's so. We do have to weigh relevance, however, against how far it is going to get us.

It seems to us that the relevance here is rather slight and the opportunities for getting off into collateral issues once you admit cost as an admissible litigation factor are quite large. Who is to say what is more expensive? Should we be getting into witnesses from the Cost Accounting Department, or safety witnesses? And we think our major emphasis here is on safety.

For those reasons we are going to sustain the objection to those questions.

Right at the end there where there were some broader objections on relevance grounds, in noting the transcript again this morning the Board had ruled on some-- I think, Mr. O'Neill, to some extent your objection on broader relevance grounds toward the end had a sort of a retroactive flavor, and I think it would be best if we simply pick up at this point with the ruling on the cost point, and turn to Mr. Eddleman and ask him to proceed.

I will note also that we said 11:00, and we've spent a little time on other matters, so we will say 11:20 instead.

Go ahead.

MR. EDDLEMAN: Thank you, Judge.

I believe there was a slight misstatement in your summary there of my position where I thought that cost considerations could cause them to seek deviations and exemptions that would weaken compliance with the NRC requirements.

But I just want to note that for the record and say that this will probably be something to tell my grandchildren about, that I have witnessed the achievement of having the consideration of cost outlawed in Bankruptcy Court.

JUDGE KELLEY: They will love it. Okay.

CROSS-EXAMINATION (Continued)

BY MR. EDDLEMAN:

Q I would like to refer the panel to Applicants' Exhibit 7, please. This, as I understand it, is the Safe Shutdown Analysis summary and description with any changes that were made recently typed in it.

A (Witness Serbanescu) I'm sorry, Mr. Eddleman, please repeat the question.

Q I just said do you have Applicants' Exhibit 7?

A Yes.

Q Now in that exhibit, I believe it is page 3, the legend of abbreviations.

A Yes.

Q Down at the bottom there is a note that says:

"Asterisk indicates redundant safe shutdown equipment located in the fire or safe shutdown analysis area."

Correct?

A Yes.

Q Okay.

So in looking through this document if we wanted to find out what equipment had redundent equipment located in the same fire area or the same SSA area, that would be indicated for each of these SSA areas by an asterisk?

A Yes.

Q Okay.

In the Area 1-A valve, for example, on page 10 at the top-- Do you have that?

A Yes.

Q In Item 15 at the top there, the table for the following systems, it seems to me that every one of those with the exception of AH-93 has an asterisk beside it. Is that correct?

A Yes.

Q Okay.

I would like to turn now to another short area here.

Mr. Waters, at page 10 of your prefiled testimony--

A (Witness Waters) Yes?

Q Pardon me. I've got the wrong page.

I'm sorry, I meant to refer you to page 8.

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End C1

I believe Mr. O'Neill will be presenting later on what we agreed to strike in this section. But in the last part of that answer you say statistics show for fires occurring in areas protected by sprinkler systems and then you gave us some figures about what occurs.

What kinds of fires are those? Are those industrial fires only?

A. I would have to turn to the reference.

Q. You don't know?

A. I don't know right off the top of my head, no.

Q. All right.

Mrs. Serbanescu, I would now like to turn to the area of the fire hazard analysis. This refers to part four of Contention 116 as explained -- as reprinted in your testimony of August 9 on page four.

A. (Witness Serbanescu) You said Exhibit 6? What page?

Q. Pardon me. I want to talk about Exhibit 6 because that is Appendix 9.5A.

A. No.

Q. It includes Appendix 9.5A, does it not?

A. Yes.

Q. Okay.

Now I want to ask you concerning the part of Contention 116 that is numbered four on page four of your

August 9 testimony.

A. Could you please simplify your question? You are going all over the place.

Q. I am just trying to identify these documents for you.

Do you have page four of your August 9 testimony available to you?

A. Yes, I do.

Q. All right.

Now have new smoke generation rates been calculated for the revised combustible loadings in this Exhibit 6?

A. No.

Q. Okay.

Are the smoke removal requirements that were discussed in Section 9.5 in earlier versions still applicable to the Harris plant?

A. No.

Q. Is there an exception in the rules that provides that?

A. There does not have to be an exception.

Q. All right.

In which section, if you recall, of the analysis of either Section 9.5.1 or 9.5A is the smoke removal discussed?

A. Just a minute.

(Pause.)

First on page 9.5.1-10.

Q. All right.

A. The third paragraph from the bottom under the heading "Limitation of Fire Effects" it reads:

"...smoke and heat concentrations in fire areas are reduced by the use of building ventilating systems. However should sufficient heat be generated by a fire to close automatic fire dampers, smoke removal capacity will be reduced."

Further, indirectly related to the smoke removal, however, a change occured in the philosophy of the ventilation of the plant. On page 9.5.1-29, on the top of the page in discussing about air duct detectors, which indicate presence of smoke, it says:

"...the detectors' automatic trip of ventilating system in compliance with the MFPA 90A recommended practices..."

Further, on page 9.5.1-33 --

Q. Yes.

A. -- it says:

"...smoke venting of the cable spreading area is accomplished using the normal partially circulating ventilation

system which is capable of a once through operation. Should sufficient heat be generated by a fire to close automatic fire dampers, smoke removal capacity will be reduced."

Further, in a number of places, like on page 9.5.1-35, in the description of various protection provided for safety related pumps, a similar statement exists.

Q All right.

And there are other similar statements like those we discussed --

A That's correct, plus an individual fire area.

Q All right.

A Further in the methodology for the fire hazards analysis -- and I am getting to it --

Q Okay.

A There is no discussion about removal of the smoke.

Q All right.

Mr. Waters, if I may refer you to page 9.5.1-10, which I believe was the first one Mrs. Serbanescu identified concerning smoke, down at the bottom of that page, item two says:

"...partially recirculating ventilation system is provided in other fire areas which do not contain airborne radioactivity...," correct? The

first sentence of that?

A. (Witness Waters) That's what the first sentence of that says, yes.

Q. And on the bottom of that it says:

"...non-recirculating ventilation systems are provided for fire areas which may contain airborne radioactive materials...," correct?

A. That is what that says.

Q. Now yesterday didn't you describe a portable smoke ejection mechanism, which, if it were used in an area, would eject smoke to an adjacent fire area?

A. That is correct.

Q. If such a system were used in an area -- in a fire area where there was a fire and radioactive materials, could it eject radioactive materials into an area which has one of these recirculating ventilation systems?

A. Potentially. But that is something that is considered by the fire brigade team leader because he is not only trained as a licensed operator in assessing the fire situation and the safety of the plant but he is also trained in the radiological consequences and he is able to balance these things as he is assessing what he needs to do to successfully fight the fire.

Q. And he has to do that right on the spot?

A. Yes.

Q Okay.

Now I would also like to refer you to the discussion of detection systems. I believe it is page 9.5.1-25.

A I have that page.

Q In the middle it describes -- it says -- this is the paragraph that has two little "15" bars beside it in the middle of the page.

A I have it.

Q It says:

"...power for operation of fire dectection systems and for actuation of fire suppression system" -- it says "system," I guess it means "systems" -- "is supplied from the balance of plant static uninterruptable power supply."

Is that a redundant power supply?

A You mean the power supply to the detection system, is it redundant, is that your question?

Q Well that is one part of it. Let's start with that.

A I don't remember specifically. I do not believe it is.

Q All right.

As to the --

A That is the power supply to the detection system

you are asking is that redundant, does it come from two separate redundant sources?

Q That is what I was asking.

A My answer is I do not believe it is.

Q All right.

Now as to the supply of power into this power supply, is that redundant?

A Yes, it is.

Q All right.

But it is the single power supply that runs through the plant?

A For this particular power supply, to the best of my recollection, yes.

Q And all detectors and all actuation systems for fire suppression come off of this system, is that correct?

A That is my understanding, yes, from this statement.

Q Okay.

And it is assumed in your fire hazard analyses, is it not, that these detectors and suppression systems will have power supplied to them if a fire occurs?

A Yes, it is.

Q All right.

Mrs. Serbanescu, if I can turn back to you now, in Appendix 9.5A, what is the method of analysis of fire spreading that is used in that appendix?

A. (Witness Serbanescu) Could you tell me what section are you referring to exactly? That appendix has some 150 pages.

Q. Well what I am asking is in general -- I know there are a number of fire areas with some analysis in there, as mentioned in this fourth revisi n of Contention 116 that you mention in your testimony.

What I am asking you is what is the method of analysis in general in that appendix for figuring out what happens if, or how the fire spreads, if you have a fire in one of these fire areas?

A. Generally speaking we are looking at where the combustible is; we are looking at the combustible loading, we are looking at a number of things just as it is listed in the fire hazards analysis. And I think this is a very broad subject and I think that it might be beneficial for the Board to either explain or for me to tell you that I cannot say in three words how this was done, it will take me half a day to explain.

Q. Since I only have two hours for questioning, I don't believe I can fully explore that with you. Let me try and see if I can ask you some shorter questions perhaps about this.

A. All right.

Q. The analysis that you are describing there, the

fire loading is the Btu's per square foot?

A. Correct.

Q. And that's Btu's of combustible materials in the area estimated, and then divided by the square feet of the area?

A. You just said "estimated" and I object to it.

Q. Okay.

Do you in fact measure the Btu's per square foot?

A. In our methodology we explain how we do it. The methodology for the fire hazards analysis is in Section 9.5.1, if I could refer you to it.

Q. All right.

A. It is starting on page 9.5.1-40.

Q. -40?

A. Yes, four zero.

It is Section 9.5.1.3, Safety Evaluation, in paren, Fire Hazards Analysis.

Q. All right.

A. Further on page 9.5.1-41 we identify what we have been looking for, the nine or ten items which we considered for every fire hazard, analysis of every area in the plant.

Q. Those are the items little "a" through little "j" on that page?

A. That's right.

Q. Okay.

A. And further we explain what we did for each one of them.

Q. All right.

A. When we are turning to page 9.1 -- I'm sorry, 9.5.1-42, approximately in the middle of the page we explained how we inventory the combustible loading and how we equate it to the fire area surface or the fire rated floor surface or the fire zone area.

To summarize, we are inventorying the actual charcoal filter -- the charcoal absorber. We are inventorying the lube oils, the combustibles.

However for the cable tray we use a conservative approach. We consider that all the cable trays in the plant are filled to maximum capacity except for three fire areas in the plant which are Cable Spreading Room A, Cable Spreading Room B and Auxiliary Control Panel Room, for which we took an actual average fire load plus approximately 5 percent. This is explained here.

Q. All right.

Since this exhibit is in evidence that statement of how the analysis was done can speak for itself, can it not?

A. Yes.

Q. Okay.

Now I would like to ask you concerning -- it might be pages 10 and 11 of your August 9 testimony.

MR. O'NEILL: I couldn't hear that last question, Mr. Eddleman.

MR. EDDLEMAN: I was referring to pages 10 and 11 of Mrs. Serbanescu's August 9 testimony.

endWRB#2

MR. O'NEILL: Thank you.

BY MR. EDDLEMAN:

Q. This gives the standard time-temperature curve characteristics, or at least some of them, in answer 13, does it not?

A. (Witness Serbanescu) Yes.

Q. And then if we turn over to page 11, continuing with that answer, the statement is made that this standard time-temperature curve has been determined empirically to represent a common worst case "exposure fire." Does that mean it's a real worst case?

A. It is my understanding that the National Bureau of Standards have actually burned to destruction a five-story and a two-story brick wood-joisted building loaded with waste lumber. And the produced overall results were approximated in the standard time-temperature curve which is used throughout the United States.

Q. All right. So that's where that determination of worst case came from?

A. I would assume so.

Q. All right. Now, the Shearon Harris nuclear plant is not a brick wood-joisted building loaded with waste lumber, is it?

A. No.

Q. Do you know what the BTU content of lumber is per pound?

A. From the top of my head, I do not.

Q. Would you accept, subject to check that, somewhere between 4 and 7,000 BTU's per pound is the range of calorific values for dry wood?

A. I do not accept without seeing it.

Q. All right. At any rate, you could look this up in some standard references of calorific values, just as you've done for calorific values of things in the plant, couldn't you?

A. I suppose so.

Q. Don't you know so?

A. I'm sorry?

Q. Don't you know so?

A. What do you mean?

Q. Isn't it true that you could look up the calorific value of wood in a table of --

A. Yes.

Q. All right.

Now, the materials in the Harris plant, do you know at what temperature the cable insulations used in the Harris plant would burn?

A. Around 6 or -- 6, 700 degrees fahrenheit, to the best of my knowledge.

Q. Is that the temperature at which they would ignite or is that the temperature at which they would -- which they

would produce if they were burning?

A. That is the temperature at which the insulation may start to deteriorate and shorts could occur.

Q. All right.

Now, is there any analysis with one-hour fire barrier, such as used to wrap cables that are redundant and in the same fire area as to what the temperature on the other side of that barrier gets to,when it's subjected to the standard time temperature condition that you give on page 10 of your testimony?

A. Please repeat the question?

Q. All right.

Let me ask it in a slightly different way and see if I can clarify it.

Have there been tests, to your knowledge, of what temperature is produced on the other side of a one-hour fire barrier or fire route such as is used on redundant cables in a fire area at the Harris plant, when that route or barrier is subjected to the standard time temperature curve of a fire, as described in your answer 13?

A. I know that tests have been performed. I do not recall the temperature inside the wrap. But I know that the respective tests were run with the cables being energized and throughout the fire test, as well as after the fire test, following by a whole stream the integrity of the cables and

of the current transmission through those cables has not been damaged.

Q. Do you know what temperatures are commonly encountered in industrial equipment fires, such as might be involved with, say, a pump spilling oil and that catching on fire?

A. Depending upon the amount of oil spilled, depending upon how fast the fire burns, how much oxygen there is, but, yes, the temperature could reach within a few minutes, in excess of a thousand fahrenheit.

Q. Okay.

It could go higher than that if the fire were not controlled, could it not?

A. Say that again, please?

Q. It could go higher than a thousand fahrenheit if the fire were not controlled, could it not?

A. The longer the fire burns, the longer the temperature will increase providing there is enough combustible in the area to burn.

Q. All right.

A. And providing there is no suppression or there is no intervention by the fire brigade to put it out.

Q. Okay.

The -- let me turn now to the diesel generator day tanks, if I may.

Do you know what temperature diesel fuel burns?

I don't mean ignites. I mean if it is ignited, what temperature it tends to burn at if it's supplied with air?

A. Oh, it burns at very high temperature.

Q. Thousands of degrees fahrenheit?

A. A thousand and over, if it burns, if it continues burning.

Q. And in fact, we could look up a typical flame temperature for diesel oil in a standard reference, could we not?

A. Yes. That is providing you will have the entire room engulfed in a flame.

Q. Okay.

Or a substantial amount of diesel oil burning within the room, right?

A. Yes.

Q. Okay.

Now, the day tanks are in a room that, in effect, has a shelf that the tank sits on, are they not?

A. I'm sorry. Please repeat the question?

Q. The day tanks for this diesel fuel, for the diesel generators at the Harris plant, they are located in rooms which, in effect, have a shelf which the tank sits on and below that there is a bottom area of the room under the tank, correct?

A. Yes. You mean the tank is located on a platform and

it is seismically supported.

Q. All right.

Now, the access to this room, is that at the bottom of the room or is it nearer the level of the tank?

A. To the best of my recollection, the entrance into this room goes on a number of -- occurs through a door which is located above the floor level. I do not know the number of steps, but I know that the door is above the capacity of approximately 110 percent of the entire fuel oil plus whatever could be. That means 110 percent of the 3,000 gallons. And the door is above that.

Q. All right.

Now, does that mean that if the entire 3,000 gallons spilled into tne bottom of the room and just leveled out there, that you'd have a 10 percent margin over that stable level before you came to the level of the door.

A. If it spills, yes, but it is very unlikely to occur because we are talking about a seismically design in construction assembly and it's very unlikely to occur. This construction is capable of withstanding a safe shutdown earthquake.

Q. I recognize that you may not be an earthquake or seismic expert but, does fuel in tanks tend to slosh during an earthquake?

A. I'm sorry. Could you please repeat the question?

Q. Does fuel in tanks tend to slosh -- move back and forth -- during earthquake, or move up and down?

A. I would assume, yes.

Q. Okay.

If fuel were spilled, would it also tend to slosh or splash drops from the tank to the part below.

A. Drops, yes. But it's not 3,000 gallons of oil.

Q. You're saying that if the tank itself were not full, then the amount that could be spilled from it would be less than 3,000 gallons?

A. I don't think I understand your question.

Q. I'm just trying to figure out what you said there. Maybe I'd just better leave it; I don't have a lot of time.

Is the tank -- are these day tanks built to any NFPA standard, National Fire Protection Assoc. standard for oil tanks in industrial buildings?

A. The diesel fuel oil day tank is a safety class 3, seismic category 1 component, which is designed to remain functional after the safe shutdown earthquake.

Now the diesel day tank room and the day tank construction is in accordance with NFPA 37.

Q. NFPA 37. Okay.

And what are the requirements that that gives for enclosed supply tanks inside buildings?

A. To be enclosed within a three-hour rated barrier

which this tank is.

Q. Are you familiar with NFPA 31's requirements for installation of enclosed supply tanks inside buildings?

A. Yes.

Q. In fact, these are part of the proposed Eddleman Exhibit 2 labeled 116-1 beginning on page 31-29, are they not?

A. One second please.

(Pause.)

Eddleman Exhibit 2, yes.

Q. All right.

Can I now ask you to refer to Exhibit 7 -- let me see if I can find the page number of this. Page 49.

A. I'm sorry, you said Exhibit 7?

Q. Exhibit 7, page 49.

A. One minute please.

(Pause.)

Yes.

MR. O'NEILL: Mr. Eddleman, there are two pages 49 in Exhibit 7. There are two sections. One is the summary of the safe shutdown analysis. One is the description. Will you please be more specific for the record?

MR. EDDLEMAN: I believe I'm in the summary in the front part of it. I think there's only 49 pages,or 48 pages, ahead of it. One is the first page 49 that occurs in this document if you go through from the front, so I believe

it is the summary.

MR. O'NEILL: Thank you.

BY MR. EDDLEMAN:

Q. Do you have that?

A. (Witness Serbanescu) Yes.

Q. Okay.

Is this the day tank area that is described here?

A. No.

Q. Okay.

What is this area?

A. This is an area located in the diesel fuel oil tank area.

Q. The diesel generator cables are described as going through this area?

A. Diesel tables -- cables that related to the diesel generator system,yes.

Q. An asterisk indicates that the redundant cables for this system also goes through this area?

A. Yes.

Q. To your knowledge, have cables like that ever been exposed in a test to a diesel oil fire?

A. Similar types of cables? Do you mean similar types of tables?

Q. That type, that specific type of cable or similar types, yes?

A. I don't know.

Q. All right.

Referring again to proposed Eddleman Exhibit 2, do the standards for installation of --

A. One second. You are going a little too fast.

Q. I'm sorry.

JUDGE KELLEY: Which Exhibit is that, Mr. Eddleman?

MR. EDDLEMAN: 116-1, Eddleman 2.

Let me distribute to the Board this listing which I think makes it a little easier to know which is which.

JUDGE KELLEY: Okay.

(Documents distributed.)

MR. EDDLEMAN: This has previously been distributed to the Staff and Applicants and the witnesses or to Mrs. Serbanescu. What it is is just the cover letter when these exhibits were filed. And then handwritten into the left of them is tne proposed exhibit numbers for each. So it makes it a little easier to see which one is which.

BY MR. EDDLEMAN:

Q. Referring to proposed Exhibit 2, Standards for Installation of Tanks inside Buildings, do those standards conflict in any way with those of NFPA 37?

A. (Witness Serbanescu) It is not applicable.

Q. Why not?

A. As stated in NFPA 30, paragraph 1-1.8, which can be found in another Eddleman exhibit --

Q. And that is exhibit 4 marked 116-A?

A. Well, it's your exhibit, so I don't know.

But it says, "Installations made in accordance with applicable requirements of standards of National Fire Protection Association." There is a list of standards and one of them is, "For installation and use of stationary combustions engines and gas turbines NFPA 37 shall be deemed to be in compliance with this code."

Therefore, we meet NFPA 30 and NFPA 30 does not pertain to NFPA 31. And we are in compliance with NFPA codes, which is more applicable to our type of installation than NFPA 31, which if we turn to the applicability of it, pertains more to commercial application, domestic application, heating, portable equipment, and so on.

Q. Just for clarity, you were reading for a thing that appears on the first page of Eddleman Exhibit 4; were you not? That 1.8 NFPA 30?

A. I was not reading from Eddleman Exhibit. I was reading from a copy of the NFPA code 30, Flammable and Combustible Liquids Code, dated 1977. The code in effect for the Shearon Harris nuclear power plant.

Q. Does that mean that if the code were updated after '77 that the Harris plant would only comply with the '77 code?

A. That's correct.

Q. All right.

Let me ask you to turn to Eddleman Exhibit 4 labeled 116-3 on the first page.

A. Eddleman Exhibit 4 does not give me a complete number of pages even though the statement which I have read appears here on page 30-9.

Q. It does appear on page 30-9 under the heading in bold face 1-1.8, does it not?

A. Yes.

Q. And it's the same statement that you read?

A. Yes. Except I read the statement from the code in effect applicable to Shearon Harris, which Shearon Harris plant is committed to.

d 3

4 fls.

For the Board's information, the NFPA standards get updated anywhere between two to four or five years as pertinent information becomes available or as the NFPA committees decide to upgrade the codes.

JUDGE KELLEY: Thank you.

BY MR. EDDLEMAN:

Q All right.

Now what standards does NFPA 37 provide for tank storage?

A (Witness Serbanescu) As I said earlier, the NFPA -- first of all, NFPA 37 does have specific information pertaining to day tanks. And NFPA 37 requires day tanks in excess of 600 gallons to be enclosed within three hour rated barriers and our tank is.

Q Okay.

Now is it 600 or 660 gallons?

A I don't recall from the top of my head. I gave an approximate number.

Q Do you have NFPA 37 with you?

A I do.

Q Okay. Could you look that number up?

A Yes.

Q Please do.

(Pause.)

A What exactly are you interested in from this code,

the capacity of the tank?

Q That is what I asked you about, isn't it?

A. I just wanted to make sure.

Q. Day and supply tanks -- NFPA 37, Chapter Five, Fuel Supply for Liquid Fueled Engines, Section 5-3, Fuel Tanks for Diesel and Fuel Oils, Section 5-3.5 -- it is a long paragraph I am going to read:

"Day and supply tanks with individual capacities larger than 660 gallons (550 imperial gallons), (2498 liters) or those tanks which cause the unenclosed aggregate capacity to exceed 1320 gallons in a building shall be enclosed in accordance with paragraph 5-3.7."

Turning to paragraph 5-3.7 --

JUDGE KELLEY: Is that very long?

WITNESS SERBANESCU: Yes. Four paragraphs.

JUDGE KELLEY: Do you know the text, Mr. Eddleman? We might save the time of reading the whole thing.

MR. EDDLEMAN: I didn't ask her to read that. If I may just come in at this point and ask a question:

BY MR. EDDLEMAN:

Q. Does that paragraph, that Section 5-3.7, require three hour fire barriers to completely enclose top and sides and bottom the tank?

A. (Witness Serbanescu) Yes.

Q And that's the same requirement, is it not, that is in Section 2-4 of NFPA 31 for the supply -- the enclosed supply tanks inside buildings?

A Mr. Eddleman, we have designed to a code. The code we designed to says this -- I don't see any reason in comparing your exhibit to the code we complied to.

Q Mrs. Serbanescu, if you will bear with me, I am asking the questions and I would like you to just answer whether Section 2-4.5.3 of Eddleman Exhibit 2 makes the same requirement for enclosure, fire barriers enclosing a supply tank as the section of NFPA 37 that you just answered about.

A Please repeat the paragraph number of Eddleman Enclosure 2?

Q Page 31-29.

A One second please.

(Pause.)

31-29, yes.

Q Okay.

Paragraph 2-4.5.3.

A I have to see what tanks in Eddleman Enclosure 2, Paragraph 2-4.5.1 and the tanks enclosures spelled out in Eddleman Exhibit 2, paragraph 2-4.5.2 is in order to answer the question.

Q All right. That refers to tanks of not more than

10- and 15,000 gallons, does it not, directly above that?

A. If I read it correctly, paragraph 2-4.5.1 says:

"In buildings of other than fire resistant construction the gross capacity of tanks shall be not more than 10,000 gallons."

So this paragraph does not apply to Shearon Harris because the day tank is enclosed within fire resistant rated construction.

Q. And that is what is covered in 2-4.5.3.

A. I'm sorry, I didn't get there.

Q. Please take a look.

A. I am. I'm slow, I'm sorry.

In paragraph -- You see the Board doesn't have this information and the record doesn't say it.

JUDGE KELLEY: I believe we have most of that, I am following you now.

WITNESS SERBANESCU: Okay.

Yes, in buildings -- All right. So we meet the....

What is your point, Mr. Eddleman?

BY MR. EDDLEMAN:

Q. The answer is yes, right?

A. (Witness Serbanescu) Yes, but it is not applicable.

Q. Now wait a second. Just let me ask you another question now.

In 2-4.1, up at the top of that Section 2-4 on the

same page it says, does it not, that:

"A supply tank larger than 660 gallons capacity shall be enclosed when installed inside of a building...," yes?

A. Yes.

Q. All right.

Now then 2-4.5, which I think you also mentioned says:

"...enclosed tanks in buildings shall be in accordance with the following...," does it not?

A. Yes.

Q. And then following that we have in immediate order 2-4.5.1 and 2-4.5.2 and 2-4.5.3 that I have been asking you about, don't we?

A. Yes.

Q. Okay.

A. There are some exceptions.

Q. Let me ask you this:

Does NFPA 37 provide for the type of fire door that shall be used for tank enclosure?

JUDGE KELLEY: Can I ask, just for clarity, that 37 which I believe was referred to earlier and you read portions of it, that as far as I know we don't have.

MR. EDDLEMAN: I neglected to put that in.

JUDGE KELLEY: But does it also derive from this

book called Flammable and Combustible Liquids Code, is that where it comes from?

So if we had the whole book would we have 37?

WITNESS SERBANESCU: Yes.

JUDGE KELLEY: We are not off on a totally different publication now, are we?

MR. EDDLEMAN: No, we are not. This is all out of the National Fire Protection Association Code, although some of the versions may be a little different. Mrs. Serbanescu has already addressed updating.

JUDGE KELLEY: All right. Go ahead.

BY MR. EDDLEMAN:

Q. Could you refer to NFPA 37 and the question I had asked was what the requirements were for fire doors in tank enclosures in that code?

A. (Witness Serbanescu) Class A fire doors if it opens inside the building, which it does, and it is a Class A fire door for the Shearon Harris design.

Q. All right.

Is that door required to be self-closing under NFPA 37?

A. Yes.

Q. Is the requirement for a non-combustible liquid type sill or ramp in NFPA 37?

A. Yes, "...opening shall be protected by a

ramp or sill high enough to contain the entire contents of the tanks within the walls..."

Let me read the whole statement:

"...to the height corresponding to the level of oil that will be retained and the sill shall be built to withstand the lateral pressure due to the liquid head and walls and floors shall be waterproof."

Q. All right.

A. "In lieu of this, a drain to a properly-sized underground is permissible."

Q. Does the Harris day tank enclosure have a drain?

A. Yes.

Q. Is it always open?

A. No.

Q. Under what conditions would it open?

A. It can be opened by an individual when it is necessary to drain.

Q. Is this a manual operation or an automatic operation?

A. I don't know.

Q. All right.

Do you know what individual would -- would it be an operator in the control room or would somebody have to go out to the diesel generator building?

A. I don't know.

Q. All right.

Let me ask you to refer again to proposed Eddleman Exhibit 2 at page 30.

A. Exhibit 2, page 30.

Q. That is on the last sheet, the left-hand side.

JUDGE KELLEY: We are approaching a break time.

MR. EDDLEMAN: This is the last question I have on this particular point.

BY MR. EDDLEMAN:

Q. The provisions of Section 2-4.8 there, are they not essentially the same as the ones that you just quoted from NFPA 37 for the opening and sill or ramp?

A. (Witness Serbanescu) Let me read it, please.

Q. Go ahead.

(Witness Serbanescu reading.)

A. Functionally the same but not the same wording.

Q. All right.

So the answer to the question of similarity is yes?

A. One second, I didn't say that. It is not identical.

Q. Okay. I will just accept your previous answer.

MR. EDDLEMAN: Now is a good time for a break for me.

JUDGE KELLEY: All right. Let's take ten minutes.

(Recess.)

JUDGE KELLEY: Back on the record.

Mr. Eddleman, will you resume?

MR. EDDLEMAN: Okay.

BY MR. EDDLEMAN:

Q Mrs. Serbanescu, would you refer to Eddleman Exhibit 3, labelled 116-2, please?

A (Witness Serbanescu) Will you please repeat the exhibit number?

Q 3.

A Exhibit 3. Yes.

Q Okay.

This contains, does it not, a table of contents of NFPA 30?

A Yes.

Q Okay.

And now if we would pick up--

A I would like to point, however, that this Eddleman Exhibit 3 is the NFPA Standard dated 1981 and it is not the one to which Shearon Harris has been designed.

Q Is the Shearon Harris designed to NFPA 30 of 1977?

A Yes.

Q All right.

Is there a reason why you don't put your fire protection design in accord with the latest codes?

A Because a plant-- The plant design has been

started way back, and we have to put a code year in effect to which we comply. We don't know how the codes will change in the future. Therefore, we cannot second-guess what will happen, so we abide by the code and go by that.

Q Well, when the NRC changes their requirements you comply with those changes, don't you?

A The NRC requirements in fire protection so far have been Branch Technical Positions except for Appendix R to 10 CFR 50, which is a federal law.

Branch Technical Positions can be complied to as suggested by the NRC or an equally acceptable solution may be provided.

Appendix R to 10 CFR 50 and the Safe Shutdown Analysis was a more stringent requirement but that was a mandatory change given by the NRC. That is why it was taken into consideration.

MR. EDDLEMAN: I haven't mentioned this before, but for a question like that could I get the witness to answer Yes or No, and then explain the answer?

JUDGE KELLEY: Well, sometimes. It sort of depends on the question.

MR. EDDLEMAN: Well, let me drop it for this one.

JUDGE KELLEY: Why don't we try it next time around, and it may or may not be appropriate.

BY MR. EDDLEMAN:

Q Is General Design Criterion 3 of 10 CFR Part 50 also a federal law that you have to comply with?

A (Witness Serbanescu) Yes.

Q All right.

Now when the NRC changes its regulations, which I believe GDC-3 and Appendix R are part of, you do comply with those changes, do you not?

A Yes.

Q Does NRC require compliance with the current fire code?

A Please repeat your question.

Q Does the NRC require the Harris plant to comply with the current fire code?

A No.

Q All right.

Do you know if NFPA 30 was revised between 1977 and 1981?

A From the top of my head.... Wait a second. I can tell you exactly from the NFPA Code.

From the top of my head I would say No, but if you want me, I can verify with the latest Code.

Q All right. I would appreciate it if you could get that verification.

A One second, please.

Q Okay.

(Pause.)

A It goes not say. I thought in the beginning, the introduction to the Code, it might have said. But to the best of my recollection, it has not changed since '77.

Q In the 1981 Code that we have here, changes are indicated by a vertical line beside the text that has been changed. Isn't that so?

A Yes.

Q Okay.

Now if you would refer to proposed Exhibit 4, labelled 116-3,--

A Exhibit 4? Yes.

I'm sorry, I didn't catch the paragraph number.

Q I haven't given you one yet.

A Oh, I'm sorry.

Q Well, let me ask you this:

Do you know what the flashpoint of diesel oil or diesel fuel is?

A Yes.

Q What is it?

A 100 Fahrenheit.

Q 100 Fahrenheit. Okay.

Let me refer you to page 30-12 on the second sheet of Eddleman 4, at the bottom.

A Yes.

Q It defines a combustible liquid as a liquid having a flashpoint at or above 100 F., does it not?

A Yes.

Q All right.

And if you look over on page 30-13, it defines a Class 2 liquid to include those having flashpoints at or above 100 F. and below 140 F. Correct?

A Yes.

Q Okay.

And none of those sections that I just asked you to look at have any vertical bar beside it, does it?

A That's correct.

Q All right.

Now if I can refer to 116-4, Eddleman proposed Exhibit 5, please?

A Yes.

Q On page 30-17, it begins Chapter 2 for Tank Storage. Correct?

A Tank Storage? I'm sorry, I missed the page number.

Q 30-17, to the right side of the front sheet.

A Yes.

Q Okay.

And over on the left-hand side on 30-16, the second paragraph down, there is a section marked "Ventilation" there, is there not?

A Yes.

Q And it says:

"As specified in this Code, ventilation is for the prevention of fire and explosion. It is considered adequate if it is sufficient to prevent accumulation of significant quantities of vapor/air mixturesin concentrations over one-fourth of the lower flammable limit."

That's what it says. Right?

A Yes.

Q There was no vertical bar beside that particular paragraph, is there?

A There is no bar.

Q All right.

Now if I could just ask you to turn to the-- This is the exhibit that has the pages front and back, and I supplied you with the backs this morning, didn't I?

A One second, please.

As a point of information, this ventilation which you read is part of the definitions to the NFPA Code.

Q Right.

A Okay.

Q The only thing I find on page 30-18 that has a vertical bar beside it in this exhibit is the Section 2-1.3.1 on atmospheric tanks, and that whole tank has a vertical bar

beside it, does it not?

A Yes.

Q Okay.

And then I am just going through the next few pages, if you will just go along with me. I don't find any more vertical bars until part of 2-3.5.5 on page 30-38.

A The pages are not sequential any more.

Q Well, I mean in this exhibit. Let me clarify that: in this exhibit.

A All right.

I'm sorry, there are some bars in this exhibit.

Q Well, yes, I said there were some more.

Where did you find the first such bar? Is that on page 30-38 by any chance?

I believe you almost have your finger on it.

A The first bar I see on page 30-35.

Q All right. Let me go back to that.

You're right, there is a little one down here in 2.3.2.2.

Now if you turn over the next page there is a somewhat larger bar right at the top left of that one, is there not?

A Yes.

Q All right.

And right below that bar there is an exception

listed--

A Yes.

Q -- for service stations.

"Capacity of manifolded vent piping shall be sufficient to discharge vapors generated when two manifolded tanks are simultaneously filled."

Correct?

A Yes.

Q Now if you will turn to Exhibit 8, marked 116-7, on its--

A One second. One second, please.

Q Yes.

A 116- -- Exhibit 7, or 116-7?

Q Exhibit 8, 116-7.

A Yes. All right.

Q On the right-hand side of that front sheet is Chapter 7, Service Stations.

A Yes.

Q That section of the NFPA Code would not apply to Shearon Harris, would it?

A It would not.

Q All right.

A In accordance with the definitions of NFPA.

JUDGE KELLEY: Let's stipulate that the service station provisions don't apply.

MR. EDDLEMAN: Okay. Fine, Judge.

BY MR. EDDLEMAN:

Q Now as to Section 2-4 of Eddleman Exhibit 5, if we could turn back to page 30-39, which is the same sheet we were on with 30-38 before,--

A (Witness Serbanescu) Eddleman Exhibit 5?

Q Yes.

A Exhibit 5, yes.

Q All right.

On page 30-39 there--

A 30-....

Q 30-39.

A 30-39. Yes.

Q Do you have that?

A Yes.

Q A section begins there near the top, 2-4, Installation of Tanks Inside of Buildings. Correct?

A Yes.

Q And the first thing it says is that:

"Tanks are not permitted inside a building except as provided in Chapters 5, 6, 7, 8 or 9."

Correct?

A Yes.

Q Okay.

Then the next section concerns vents, and neither

of those sections has a vertical bar beside it, does it?

A That is correct, there is no vertical bar beside it.

Q All right.

What sort of vents are provided for the day tanks, the diesel generators at Shearon Harris?

A I know there are vents provided. I don't know the size of them, but I know they are in accordance with NFPA 37 and, as I said before, in accordance with NFPA 30, Section 1-1.8.

Installations made in accordance with applicable requirements of standards of the National Fire Protection Association for installation and use of stationary combustion engines and gas turbines, NFPA 37, shall be deemed to be in compliance with this Code, "this Code" being NFPA 30, being the Code which you quote me from.

Q All right, I think we have that in the record.

When did you first know that the Harris diesel generator building and day tanks -- or diesel generators and day tanks would have to comply with NFPA 37?

A We made them to comply with NFPA 37.

Q So from the beginning of your work on Harris, or from the--

A I do not recall the date, but the first time when we went on the record was in Applicants' Response to NRC

Question 280.1 which was a comparison between the Shearon Harris fire protection program to the latest NUREG 0800, Section 9.5.1 CMEB Guidelines for Fire Protection in Nuclear Power Plants.

Q And what date was that, do you recall?

A From the top of my head I do not, but I can give you the date when it was submitted to the NRC.

Q All right. I would appreciate it if you could do that.

Let us turn to proposed Exhibit 6 if we may, labeled 116-5.

A Exhibit 6.

One second. I was looking at Exhibit 7.

What page?

Q My Exhibit 6, --

A Oh, your Exhibit 6.

Q -- not your Exhibit 6. The one that is labeled 116-5, as I believe I said.

A Eddleman Exhibit 6. Okay.

End 5 Q Okay, 116-5.

Q. On page 30-69, on the front of that, it begins Chapter 5, concerning industrial plants, correct?

A. Yes.

Q. And in the sections under 5-1 scope there, there are no vertical bars beside them, are there?

A. There are no vertical bars, that is correct.

Q. It says at the bottom of the Section 5-1.1, that "This chapter shall not apply to chemical plants, refineries, or distilleries."

A. I'm sorry, I lost you. Which --

Q. At the bottom of the first paragraph --

A. Yes.

Q. -- 5-1.1 --

A. Yes.

MR. EDDLEMAN: Let me ask your Counsel if he would stipulate that the Shearon Harris plant does not fall within any of those exceptions for chemical plants, refineries, or distilleries.

MR. O'NEILL: I would ask that to my witness, I'm not an expert on the code.

BY MR. EDDLEMAN:

Q. Mrs. Serbanescu, does that exception cover the Shearon Harris plant?

A. (Witness Serbanescu) "This chapter shall not apply to chemical plants, refineries, or distilleries as defined."

Yes, it does not apply to Shearon Harris.

Q. All right.

A. But the chapter of industrial plants does not apply to Shearon Harris either, in my opinion.

Q. Well, is the Shearon Harris plant a place where some liquids are used incidental to the principal business?

A. Would you please repeat that question?

Q. Is the Shearon Harris plant a plant where some liquids, flammable and combustible liquids are used incidental to the principal business?

A. Yes.

Q. Okay.

In that 5-1.1, the first sentence reads, does it not, "This chapter shall apply to those industrial plants where (1) the use of liquid is incidental to the principal business. See section 5-2." Correct?

A. Yes.

Q. All right.

Let me turn to Proposed Eddleman Exhibit 7, labeled 116-6.

A. Yes.

Q. Now, this consists of the first two pages of NFPA 30 on bulk plants and terminals?

A. Yes. And I see a bar on the lefthand side of chapter 6 bulk plants and terminals.

Q. That indicates there's been some change in the title of chapter 6, doesn't it?

A. I don't know. It indicates a change.

Q. Okay.

Does it change somewhat -- from the previous code, there's change somewhere in that line, right?

A. Right.

Q. All right.

A. I also know that the paragraph number and the chapter numbers between NFPA 30, 1977 edition and '81 edition, at one point in time become different. And therefore, the heading may vary.

Q. I see. Okay.

But, in any event,the provisions for bulk plants and terminals do not apply to the Shearon Harris plant, do they?

A. In my opinion, it does not.

Q. All right.

So as to the requirements for loading and unloading facilities, buildings and so on, they don't apply to Harris?

A. No.

Q. All right.

Now, if we can refer to proposed Exhibit 9 --

A. Eddleman or Applicant's?

Q. Eddleman 9, please?

JUDGE KELLEY: I'd like to inject. Is this general

line going to take very much longer, Mr. Eddleman?

MR. EDDLEMAN: I'm virtually finished with it.

JUDGE KELLEY: Good.

MR. EDDLEMAN: I'm just trying to get all these things identified and get the witness to talk about them a little bit as to their applicability or inapplicability.

JUDGE KELLEY: One questions this much use of time on this. It's been about a half an hour. We're still wondering what the point is, so please finish it up.

MR. EDDLEMAN: Okay.

BY MR. EDDLEMAN:

Q. This Exhibit 9 is appendix C of NFPA 30, is it not?

A. (Witness Serbanescu) Yes.

Q. And it says that the appendix is not part of the requirements of this document, but included for information purposes only.

A. Yes.

Q. And contains additional information and recommendations bring the same number as the text with flammable and combustible liquid codes.

A. Yes.

Q. And then it discussed preferred methods of storage and liquids in buildings. Is this information applicable to the storage of liquids used incidentally in the operation of the Shearon Harris plant, in your opinion?

A. As you mentioned earlier, this appendix is not part of the requirements of the NFPA document and, therefore, we don't have to follow it.

Q. But I asked you a slightly different question. In your opinion, is the information applicable to Harris?

A. It's helpful, but it's not necessarily mandatory.

Q. Right.

Now, the sections of appendix C that we just read over don't have any vertical bars besides them, do they?

A. They do.

Q. I mean the ones that we read over, not the ones that --

A. Oh, the one that we read over do not.

Q. Okay.

Now, in terms of the control of flammable and combustible liquid that you do -- and Mr. Waters, if you have something to speak about this, please feel free to answer also.

Is that control to a NRC standard or an NFPA standard or either?

A. (Witness Waters) I don't know exactly what we call out on our control of combustible procedure. I would have to look at that and followup to see exactly what we site, but I believe it would be an NFPA reference that we would site, or it would go back to NFPA code.

Q. And you are dealing with flammable and combustible liquids in your plant procedures, correct?

A. We are dealing with small quantities, mostly referring to the area of transient combustibles.

Q. Incidental use of these?

A. Yes.

Q. Okay.

On those, are the codes in effect when the Harris was designed the applicable ones,or are the current codes applicable, since it has not yet gone into operation?

A. The applicable codes, as far as requirements in effect at the time the plant was designed and upgraded where necessary where we see additional protection could be provided from our operational aspect.

Q. So, is your answer that you're not required to use for your operations any code after the design of the plant was set?

A. That is correct -- now, to the best of my belief and knowledge.

Q. Okay.

Now, the day tanks--excuse me -- your practices with respect to these combustible liquids are described somewhat in your testimony and also in Exhibit 6, are they not?

A. They are described -- yes, they are described in my testimony. I'm not sure about Exhibit 6. Are you referring to --

Q. Applicant's Exhibit 6.

A. What was the question on Exhibit 6.

Q. Are there some descriptions of your control -- I believe Mrs. Serbanescu said this earlier -- so maybe I should just drop the question. I don't want to waste time.

A. I can't think of a specific -- what you are referring to.

Q. Well, at any rate it's in evidence and we can see whether it refers to the control, flammable and combustible liquids, can't we?

A. If it is in there and it's in evidence, then, yes we can.

Q. All right.

Mrs. Serbanescu, in Applicant's Exhibit 6, is there a description of the enclosures where the diesel generator day tanks are?

A. Yes, there is.

Q. And there is a fire hazard analysis of that area?

A. Yes, there is.

Q. Okay.

And if I want to see whether that enclosure at all complies with the code, I could check it between the code and the exhibit for compliance, could I not?

A. Yes.

Q. All right.

A. The fire rated enclosure, yes.

Q. Yes, okay.

Now, we turn to a slightly different area here. The discussion of the fire doors that had gone on between CP&L, Ebasco, and the NRC, did any of that occur at meetings, formal meetings with the NRC?

A. What do you mean by discussions with the NRC?

Q. Well, I believe that you stated yesterday that part of your responsibilities with Ebasco, in general, and also related to the Shearon Harris plant were to carry on or assist in discussions with the NRC staff regarding the FSAR answering NRC Staff questions, safety questions, and dealing with requests for deviations or exemptions by the Applicant's is that correct?

A. Yes, that's correct.

Q. All right.

And were some of these discussions carried on in formal fire protection meetings with the NRC Staff?

A. Yes. There were meetings with the NRC Staff.

Q. Do you recall whether, in any o f those meetings, the fire doors were discussed as an open item?

A. I believe that -- yes, I do.

Q. Okay,

And do you recall whether one of those meetings might have occurred late in September of 1983?

A. There were a number of meetings and, from the top of my head, I don't remember. But I really couldn't say yes or no. I say yes to the meetings, but I do not know whether it was September or October or December or when.

Q. Okay.

Let me ask you--if your Counsel will permit me to show you a document -- I don't have extra copies of it, but it's a summary of a meeting in this timeframe concerning fire protection.

MR. O'NEILL: Sure.

MRS. MOORE: Your Honor,the Staff would also like to take a look at the document.

JUDGE KELLEY: Sure.

MR. EDDLEMAN: Fine.

(Document exhibited to Counsel.)

MR. EDDLEMAN: Mr. Barth must have briefed his co-counsel on this.

(Pause.)

BY MR. EDDLEMAN:

Q. I'm going to hand you this document, Mrs. Serbanescu, and ask that you examine it.

(Handing document to witness.)

A. (Witness Serbanescu) Thank you.

(The Panel reading.)

JUDGE KELLEY: Can you tell us again just what

that document is while Mrs. Serbanescu is looking at it?

MR. EDDLEMAN: This is a document dated September 30, 1983, an NRC summary of meetings with the Applicants and Ebasco on fire protection of September 26 and 27, 1983.

JUDGE KELLEY: Thank you.

WITNESS SERBANESCU: That's correct. I read the letter and my name appears to be in attendance. I do not contest not being there.

MR. EDDLEMAN: I didn't ask you to contest it.

BY MR. EDDLEMAN:

Q Let me ask you this: In the list of items discussed, which is back in the back of that letter as an attachment, the sixth item of items discussed, what is that?

MRS. MOORE: Your Honor, I'm going to object to the use of this document in cross examination on the grounds that I believe it was on the second day of the management hearings, the Board ruled that in the exhibits to be used on cross examination were to be provided to the parties. A copy was to be provided to the parties and the Board.

MR. EDDLEMAN: This originated with the Staff, so I don't think they can object if they haven't been provided with it.

MRS. MOORE: Mr. Chairman --

JUDGE KELLEY: May I ask you to remind me at what point in time that was going to be done?

MRS. MOORE: As I understood it, it was supposed to be done at the very latest, at the time it was going to be used. But if at all possible, it was to be done before the exhibit was to be used in cross examination.

JUDGE KELLEY: Let me ask you this. Can you find the transcript site to that over lunch and since everybody has read this except the Board and the Board will go along with it, I will overrule this particular objection.

MRS. MOORE: If I can ask to borrow a transcript from someone, I do not have the transcrirt of the second day of the management hearings with me.

JUDGE KELLEY: Do the Applicants have a set, by chance?

MR.O'NEILL: Yes, sir.

JUDGE KELLEY: You can borrow one of them.

MRS. MOORE: Thank you.

JUDGE KELLEY: I'm not disagreeing with your point I just think that under the circumstances, since we've all taken time to read it, let's use it. And we can make a broader ruling after lunch when we received the transcript.

BY MR. EDDLEMAN:

Q. Is the sixth item in that list fire doors?

A. (Witness Serbanescu) For the record this is United States Nuclear Regulatory Commission, Washington, DC, September 30, 1983, Docket number 50-400 and 50-401. Applicant,

Carolina Power and Light Company, Shearon Harris Nuclear Power Plant, summary of September 26 and 27, 198[illegible] meeting held with Carolina Power and Light Company to discuss fire protection.

Enclosure 2, Fire Protection item, Item 6, Fire Doors. Comments: Open need formal submittal of information discussed at meeting.

Q. All right.

And when was that formal submittal made, do you recall?

A. This submittal?

Q. The submittal of the information discussed at that meeting; do you recall when that was made?

A. I do not know.

Q. All right. Thank you.

Let me ask you, if we may return to -- can you please turn to, in Exhibit 6?

A. Applicant's Exhibit?

Q. Applicant's Exhibit 6, I beg your pardon -- page 9.5A-1.

End 6

7 fls.

A. Yes.

Q. The area in that has been changed, has it not?

A. What do you mean by "area?"

Q. Under identification at the top of the page the area listed, that was changed, wasn't it?

A. Yes.

Q. From 50,000 square feet to 16,790?

A. I see a bar on the right-hand side. I assume it was changed. I do not know exactly what the change was.

Q. The October 10 submittal contains the marked-up version.

MR. O'NEILL: Will Counsel permit me to show it to her?

I believe Mrs. Serbanescu may have that letter up there.

WITNESS SERBANESCU: Just a minute.

MR. O'NEILL: If you would have the page and it would save time --

MR. EDDLEMAN: I can show it to her right now.

MR. O'NEILL: You can show it to her...

(Document handed to witness panel.)

WITNESS SERBANESCU: Yes.

BY MR. EDDLEMAN:

Q. It does have the change that I said, is that right?

A. (Witness Serbanescu) Yes.

Q. Thank you.

A. As a matter of fact, both the area in square feet as well as the volume in cubic feet has been changed.

Q. May I show it to you again?

A. At least that's what I saw on your sheet.

Q. Take another look at that volume if you will.

(Document handed to the witness panel.)

A. I'm sorry, I saw this cross-mark here. All right.

Q. The volume has not been changed, has it?

A. No, it has not.

Q. Now if we may refer to page three of your prefiled testimony of August 9th, Mrs. Serbanescu.

A. Page three?

Q. Yes.

A. Yes.

Q. Concerning item one in answer four toward the bottom of that page beginning at line 20 --

A. Yes.

Q. -- does the fire hazard analysis of Section 9.5A in the FSAR or in the Applicants' Exhibit 6 address the availability of control and power to safety equipment.

A. As I stated in my prefiled testimony, page six, answer eight:

"The Appendix A does not directly address the availability of control and power cables."

Q Does it address it?

A. This is done in the FSAR Subsection 9.5.1.2.2 in the general description of fire protection of cables and circuitry and in the FSAR Section 8.3 on-site power systems and, further, in the Applicants' safe shutdown analysis, which is Exhibit 7.

Q But the answer is that it is not addressed in Appendix 9.5A, is it not?

A. No, the answer is that it is not directly addressed.

Q Well how is it addressed in 9.5A?

A. If we turn to Section 9.5.1.2 of Exhibit 6 --

Q That is not part of 9.5A, is it?

A. Well it is the FSAR and the FSAR is the basis for the fire hazards analysis. And the protection which -- I mean one does not stand without the other. Even though they are listed separately for convenience, but they are together.

And the design and separation of the cables at the Shearon Harris Nuclear Plant does not occur only in the fire hazards analysis, it occurs also through electrical design.

The NRC criteria at the time when this was performed, which was prior to the safe shutdown analysis, and, further, when more stringent criteria came in effect, additional items have been provided.

Q The contention though addresses 9.5A, does it not?

A Yes.

Q Thank you very much, panel, I have no further questions.

JUDGE KELLEY: I want to ask a question so I understand the series of questions having to do with the codes and the different versions of the codes. We spent a lot of time going through these different exhibits and looking at whether they had been amended or not as between 1977, I think it was, and 1981. And we do have a responsibility to insure, as the Staff does, that there is a complete record here.

Your bottom line wasn't clear to me. What did all that demonstrate; what was it intended to demonstrate?

MR. EDDLEMAN: What I was trying to demonstrate was that those parts that had not been changed were the same in the '77 code as the '81 code.

JUDGE KELLEY: The parts that had not -- that sounds like a tautology. The parts that had not been changed were the same?

So?

MR. EDDLEMAN: Well with the two codes and that would then make the language quoted out of these applicable to the Harris plant because it is to the '77 code by

the witnesses' testimony. And that was what I was going to argue when I moved for admission of these exhibits, which is the next thing I was going to do.

JUDGE KELLEY: Well perhaps we should go to that next and you can spell it out a little more clearly for me. So far I don't understand.

MR. EDDLEMAN: Okay.

At this time I would respectfully and respectively move into evidence Eddleman Exhibits 2 through 9 inclusive as described on this sheet that I handed out to the parties and the Board.

JUDGE KELLEY: I think the titles have been read off at one point.

MR. EDDLEMAN: Yes -- which simply gives the numbers, exhibit numbers, to the left of the descriptions of them as filed on August 9, 1984.

JUDGE KELLEY: Could you expand a little bit, Mr. Eddleman, on the rest of that line of questions? I am still not with you.

As I understood the witness, she said that they designed Harris to a 1977 code and that they didn't change it; insofar as subsequent codes may have come along providing different standards, they didn't make changes.

I assume if the NRC had adopted a subsequent amendment to a code as one of their standards they would have

to do it if the NRC saw fit to backfit that requirement on all plants or all designs. But that apparently didn't happen here.

So what does the '81 code give us in this context?

MR. EDDLEMAN: Well the '81 code, in and of itself, where it was revised, would be different than the code that Mrs. Serbanescu testified the Harris plant is working with. But that is why I went through all of the questions of are there any changes in this section or are there not where the bars were. It was to establish that the sections I was asking about had not been changed from the '77 code and therefore were the same.

JUDGE KELLEY: So?

MR. EDDLEMAN: So those sections of the exhibits are applicable or demonstrate the inapplicability of certain exceptions and exemptions for the Harris plant.

And what I figured was best to do under the time limitation was to try to simply put the code sections in the record and I asked the question well you could check compliance with the code for various of these structures and storage of flammable liquids and all this sort of thing against the code, could you not, and I believe they answered yes.

JUDGE KELLEY: Oh you mean we now have in evidence portions of the '81 code and the cross establishes that

the '77 code was the same?

MR. EDDLEMAN: In those respects, yes.

JUDGE KELLEY: In those respects which either do apply or might apply -- service stations don't apply --

MR. EDDLEMAN: The service station one is simply to rule out that exception, that's what that was there for.

JUDGE KELLEY: Okay. I guess if that was the purpose, I would think counsel could work out a stipulation. It took us a half an hour -- you could have worked out a stipulation on putting that in.

MR. EDDLEMAN: We tried, Judge, and we couldn't get one.

JUDGE KELLEY: Okay. Go ahead. I think there is the motion pending.

MRS. MOORE: Your Honor, I don't mean to interrupt... Mr. Eddleman just said he tried to work out a stipulation. The Staff is unaware of any attempts for that stipulation.

JUDGE KELLEY: And the Applicants?

MR. EDDLEMAN: The Applicants informed me they wouldn't stipulate to anything and I figured if they wouldn't there wasn't much point in talking to the Staff about it.

JUDGE KELLEY: All right. That clarifies what went on.

Mr. O'Neill?

MR. O'NEILL: The reason that Applicants would not agree to a stipulation is that, as Mrs. Serbanescu pointed out on a number of occasions, these particular sections of the code are simply not applicable to the design of the Harris plant, both setting aside whether they are the right revision or not, in each case Mrs. Serbanescu pointed out that it was the wrong c de or it didn't apply to a diesel day tank at the Harris plant.

And since they were not applicable to the design of the plant, we would not stipulate that they should be part of the evidence in this proceeding because those sections of the code are irrelevant and we maintain that position here today and would not agree to receive those sections of the code into evidence.

To the extent that some part of NFPA 30 could be relevant to some part of the plant -- which it is -- that has not been established on the record except to the extent that it is referenced in the list of standards found in Exhibit 6 and there is the potential for confusion and misuse of fragmented sections of a code without, in all cases, the first part of the chapter or parts of the code which are cross-referenced to allow someone to attempt to apply the code to the fire hazards analysis.

For those reasons we would argue on grounds of relevance that these codes are not applicable and should not

be in evidence.

JUDGE KELLEY: The Staff?

MRS. MOORE: We would join in Applicants' objection and I believe that the witness specifically testified that certain sections were indeed not applicable an' Mr. Eddleman has agreed, at least with regard to one of those sections. Therefore I don't think you can have a wholesale admission of these exhibits and I don't believe that the relevance of the exhibits has been established on this record.

MR. EDDLEMAN: May I respond?

JUDGE KELLEY: Yes. Just a minute.

Is there the alternative possibility of stipulating in these portions of the code for the limited purpose -- and only on the basis that they are what they say they are, namely a copy of some code or other, without conceding that it applies to this facility or not?

I just find it -- we spent a whole half-hour messing around with these copies, Xerox copies, and comparing things and talking about lines in the margin; there has got to be a better way to do business than that, it strikes me.

Go ahead, Mr. Eddleman.

MR. EDDLEMAN: Well I agree, Judge, but unfortunately my source that I could get these from on August the 9th had the '81 code and I didn't realize that this was going

to happen at that point.

What I have tried to show through cross, and I think I have brought it out, is that the applicable provisions are either identical or functionally the same in many cases to these --

JUDGE KELLEY: And I gather that they are arguing that these sections are largely irapplicable. There is disagreement as to what applies and what doesn't apply.

MR. EDDLEMAN: Right.

JUDGE KELLEY: The witness said this code section on industrial facilities or something like that did not apply and you apparently think it does, right?

MR. EDDLEMAN: Well, I can't recall exactly what they said.

JUDGE KELLEY: I am just taking an example.

MR. EDDLEMAN: I think maybe one of them said yes and one of them said no but I am not sure.

JUDGE KELLEY: There seems to be some disagreement between the two of you with regard at least to that.

MR. EDDLEMAN: Yes. Well at least I established some answers about, you know, what the code was about and the applicability of that to what they used and so on. I am prepared to argue from it.

But I did not think -- it took that long to just get it established what they were. I did not want to try,

under the kind of time limitation I was working under or even if I had been able to start it the first thing yesterday morning and go through until now, I think Mrs. Serbanescu was wrong, it would have taken a day and a half to go through all of these comparisons and so on, just in interchange with the witnesses.

What I wanted to do was to establish which ones were applicable or were the same and try to get it in the record and argue from them, that is what I am trying to do.

JUDGE KELLEY: All right. Excuse me a minute.

(The Board conferring.)

JUDGE KELLEY: We will rule on this after lunch. Anything else along that line?

MR. EDDLEMAN: No, sir, I am finished.

JUDGE KELLEY: Okay.

MRS. MOORE: Your Honor, before we leave this I have the cite, if you would like it, to this transcript that states that copies of exhibits to be used in cross-examination must be provided to counsel for the parties as well as the witness.

JUDGE KELLEY: Thank you, what is it'

MRS. MOORE: It is transcript 2606.

JUDGE KELLEY: 2606.

MRS. MOORE: Would you like the statement read

into the record?

JUDGE KELLEY: Yes.

MRS. MOORE: Mr. Barth will read it.

MR. BARTH: This commences on line 15, your Honor, and I quote:

"What you do need to do is to bring in an adequate number of copies, so you can distribute one to counsel and the other parties, one each for the Board, one for the witnesses, so the witness knows what you are reading from. Typically if you had a total of six copies, you should go ahead on that basis."

Skipping on, your Honor, to the last two lines on the page, line 24, commences:

"And in that case you should bring your copies of those documents on the day you propose to use it or earlier and hand them out. But that is sufficient advance distribution as far as we are concerned."

JUDGE KELLEY: That was when, the last hearing?

MRS. MOORE: Yes, it was during the management hearing.

MR. BARTH: It took place on September 6, 1984, your Honor.

JUDGE KELLEY: All right. It seems clear enough.

Any comment?

MR. EDDLEMAN: I don't believe I was present at that time.

JUDGE KELLEY: Well now you know.

MR. EDDLEMAN: Okay.

JUDGE KELLEY: I believe someone from the Joint Intervenors must have been there, Mr. Runkle or somebody.

MR. EDDLEMAN: But 116 is not a joint contention.

JUDGE KELLEY: You are a Joint Intervenor though, are you not?

MR. EDDLEMAN: Yes.

JUDGE KELLEY: I think you are on notice, at least you are now.

Let's take a short break.

end#7 (Brief recess.)

JUDGE KELLEY: Let's go back on the record.

I would just offer one observation as I think the parties could have inferred from our reaction to the argument, we're somewhat troubled about the status of these industry codes and whether they ought to be in or whether they ought to be out. One thing does occur to us that I think has been mentioned before, the relevance or irrelevance of an industry code, all of these codes look like legal provisions. Basically, they are more in the nature of a question of fact, something to be derived from an expert witness, rather than from legal disputation. And when it comes our turn I know I intend to ask some questions on that subject and Applicant's maintain that these codes are irrelevant. They'll have their opportunity on redirect to determine that, look into it. All of which fits with our intention to defer a ruling until a little later.

Is the Staff ready?

MR. RUNKLE: Excuse me, your Honor, when do I have a chance for cross examination?

JUDGE KELLEY: Pardon me?

MR. RUNKLE: When do I have a chance for cross examination of these witnesses?

JUDGE KELLEY: Frankly, I didn't think you had one. Can you explain to us why you think you do?

MR. RUNKLE: The Conservation Council is a party

and this is not one of our contentions. And we thought as a party we had the right to cross examine Panel or Witnesses.

JUDGE KELLEY: Parties want to comment on the Northern State's Power Company decision?

I'm surprised, Mr. Runkle, because sure enough you're a party. This is the first I knew you had any intention to cross examine on this contention. Frankly, I'm surprised.

There's more?

MRS. MOORE: Your Honor, as I understand the Prairie Island decision, only those parties with a discernible interest in the contention have the right to cross examine and I do not believe that the Conservation Council of North Carolina has shown any interest whatsoever in this contention.

And so therefore there is no discernible interest.

JUDGE KELLEY: Do you mean as far as showing interest is concerned, e.g., participation of discovery, things like that?

MRS.MOORE: That and, your Honor, I don't believe that they proposed any contentions relating to fire protection at all. And their petition to intervene didn't -- as I remember it -- refer to fire protection as a safety concern for them.

JUDGE KELLEY: Okay. Mr. O'Neill?

MR. O'NEILL: We would support Mrs. Moore's objection and add the following: Mr. Runkle was not here

yesterday. To that extent, he is not in the position to know what ground has been covered, what ground has not been covered so that we could very well end up with a series of questions, objection asked and answered, question objection asked and answered, that would not contribute at all.

And I respond, also, to your surprise if indeed a party who has heretofore not expressed any interest in a contention would desire to cross examine,at least one would expect that that intention would be made known at the beginning of putting on a particular witness so that the parties could respond to it then and the judges would have an opportunity to factor that into an attempt to run this proceeding.

So we certainly would object to Mr. Runkle having that opportunity.

JUDGE KELLEY: Mr. Runkle?

MR. RUNKLE: Well, as to the point about not knowing what ground had been covered, I had a list of questions, showed them to Mr. Eddleman at the break, and he said that he had asked certain of these questions. And I have trimmed those out of my questions.

As to expressing an interest, as I recall in approximately two years ago, in late '82, we submitted a motion to adopt several of Mr. Eddleman's contentions. And the board never ruled on it and the parties, as I recall,

did not even respond to it. And I am not so sure whether Mr. Eddleman's contention 116 was part of that filing or not.

To express an interest -- I mean does this need to be a formal thing. We are interested in being involved in this and when does that interest need to be shown?

JUDGE KELLEY: Well, I think for one thing, you may not be familiar with it, there was a Commission decision in early 1975. The citation is 1NRC1, it's easy to remember. It involves Northern State's Power Company, the Prairie Island Reactor. And the issue there generated from a licensing board or an appeal board to the Commission. And the Commission itself spoke to this as its first official pronouncement in the judication versus the NRC.

The question was what kind of a situation when there's one Intervenor in a case with a particular contention. Say there are two Intervernors, A and B and Intervernor A has a contention and Intervernor B, at least in some circumstances, can cross examine on that contention even though he is not officially a co-sponsor of it.

And it seemed to me that's -- at least insofar as I've described that -- that fits you well enough. It, I think, left the Board to work out the practicalities of that kind of a thing.

You should know now -- we had a discussion earlier this morning about scheduling, just how we're going to run this

case in the next couple weeks. We're thinking about putting in time limits. And in that kind of a context, we may or may not do that, but we do have to know, at least, who the players are going to be, and how much they think -- how much time they need.

Let me ask you just a practical question in terms of questions you want to put. Can you give me an estimate of how long it would take to go over that ground?

MR. RUNKLE: I have eight questions and four of them are yes, nos. I would imagine ten minutes.

JUDGE KELLEY: Excuse me.

(Board conferring.)

JUDGE KELLEY: We don't want to treat it as a precedent for the rest of the case and we'll be figuring out ways of structuring that. For now, today, we'll grant your request and allow you to put those questions and we will have some more to say on future questioning of this nature, questioning by a party other than the sponsor of the contention.

Go ahead on this one.

CROSS EXAMINATION

BY MR. RUNKLE:

Q. Mrs. Serbanescu, can you turn to page 22 of your prefiled testimony?

A. (Witness Serbanescu) Yes.

Q. In this page you discuss various types of fire

detectors, do you not?

A. Yes, I do.

Q. In questions from Mr. Eddleman, I think it was Mr. Waters who stated that he thought that the primary readout panel was in one of the security stations. Do you recall that?

A. I do not know what you mean by primary readout panel.

Q. Is there some kind of control board where all the different fire detectors come into?

A. There are a number of them.

Q. Are they all in one location?

A. No.

Q. Mr. Waters?

A. (Witness Waters) Yes?

Q. Is the primary control board with the readout panel in one primary location?

A. If you're speaking of the main fire detection information system, is it my understanding, yes, that that is in the communication room which is on the control room level of the power plant.

Q. And have you made contingency plans if there is a fire at that location?

A. I'm not aware of the specific details of our contingency plans for that area at this present time. The area

is continually manned because also in that area is the place where it is continually manned for security purposes.

Q. And do any of the cables, the hard cables leading into the fire detection readout panel, do they cross other fire areas?

A. I don't know. I cannot answer that specifically.

Q. So, do you know if they are themselves protected by fire barrier envelopes or other fire barriers?

A. I don't know the specific details.

Q. Mrs. Serbanescu, can you turn to page 23 of your prefiled testimony?

A. (Witness Serbanescu) Yes.

Q. In this you discuss water type suppression systems, do you not?

A. Yes, I do. On page 25, I'm sorry?

Q. 23.

A. On page 23, I'm discussing the detection systems selected.

Q. And then on 25 you continue on with sprinkler systems and other fire suppression systems, do you not?

A. 24 and 25, yes.

Q. All right.

Are you familiar where the water comes from in the various sprinkler systems?

A. Yes.

Q. Do any of these water supply systems cross any fire areas?

A. The piping for them runs through a number of fire areas, yes.

Q. Okay.

Are those -- is that piping protected by any fire barriers or fire barrier envelopes?

A. No.

MR. RUNKLE: Thank you, I have no other questions.

JUDGE KELLEY: Thank you, Mr. Runkle.

While we are on the point, maybe I can just raise a couple of things for future guidance.

Our next -- we're going to have the Staff panel this afternoon. From your prospective now,do you expect to have questions of the Staff panel?

MR. RUNKLE: Are you referring to me?

JUDGE KELLEY: Yes. I want to talk a little bit more about the participation aspect, and the question was whether you expected to have questions of the Staff panel, which is going on this afternoon.

MR. RUNKLE: Not at this time.

That's the best I can do.

JUDGE KELLEY: Can you go back after lunch and give us any specific indication you're going to have and then we will assume that if you don't, you don't have any?

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MR. RUNKLE: It would be rather difficult for me to do that, depending on the scope of Mr. Eddleman's cross examination. If he covers all the points that we are interested in, we won't have any questions, but if he leaves out one or two, such as he did in our opinion, he did on his cross examination of this panel, we might have some questions.

JUDGE KELLEY: Well, I suppose if we're talking about a five or ten-minute add-on or not, it's not that significant a matter. If we're talking about your coming in with an hour or two, then that's different, in terms of our scheduling. What we have had here is very brief. That wasn't any problem.

MR. RUNKLE: I would say similar if questions arise, I don't foresee any,but there might be ten minutes maximum.

MR. EDDLEMAN: Judge, if it would be helpful,I have my basic plan for that cross worked out and I could show Mr. Runkle what I think I'm going to go into.

JUDGE KELLEY: Well, if Mr. Runkle is willing to say ten minutes max now, then I think we can live with that.

Let me just go on another minute, though, about our next contention, which is number 9, which has a number of different panels. This is the environmental qualification subject. We expect that will take some time. Does the CCNC wish to participate in that?

MR. RUNKLE: No, sir.

JUDGE KELLEY: Okay, then. It's a short answer. I think for now that's all we need to know. So we may see you later this afternoon, but it'll be brief?

MR. RUNKLE: Yes, sir.

JUDGE KELLEY: Okay.

Staff?

MRS. MOORE: Staff has no questions.

JUDGE KELLEY: Okay.

EXAMINATION BY THE BOARD

BY MR. CARPENTER:

Q. I would like to ask just two questions of Applicant's witnesses and I will address the question to either of you who may be aware of the answer to respond. We've had a lot of questions about these codes with respect to the 1977 code of the Fire Protection Association. Are there any items at Shearon Harris that are not in compliance?

A. (Witness Serbanescu) 1977?

Q. Yes.

A. One minute please.

(Pause.)

The NFPA 30, 1977 is applicable to the underground storage tank. This is what we take it to be. The remainder of the system we have designed in accordance with NFPA 37.

If we are looking at the design and construction of

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the storage tank, we comply -- the section of the portion of the code which pertains to above ground tanks are not applicable. We comply with it. For the underground storage tank.

Q. Let me see if I can repeat the question.

What items can you identify in the Harris design which are not in compliance with the code. You just told me there are parts of codes that don't apply. I'm not really interested in parts of the code that don't apply. For those parts of the code that do apply, are there any items that you can identify that are in noncompliance?

A. To the best of knowledge, they are in compliance.

Q. Thank you.

You answered questions with respect to code changes between 1977 and 1981 and made the point that if there were changes you were not required to comply with them.

Are you aware of any changes that are reflected in the 1981 version of the code for which the Harris design would be in non-compliance?

A. I'm not aware of them, but I have not looked at it.

Q. Thank you.

BY JUDGE KELLEY:

Q. Mrs. Serbanescu, when you do a review of a fire protection system, such as the Shearon Harris system, as I understand it, you follow appendix R?

A. (Witness Serbanescu) Yes.

Q. And do you consider that you're bound by appendix R; do you regard that as a law, as a binding NRC requirement?

A. Yes; it is a federal law. I believe that is a legal point and I think I'd like to pass this on to the lawyer, but --

Q. It's certainly legal, I grant you that --

A. Okay. But we do look at the separation criteria in the Shearon Harris nuclear power plant in accordance with appendix R and wherever the criteria has not been met, we highlight it and we requested deviations from the Staff.

Q. The way I'm coming at it is, at least in one aspect it's a legal point, but as a reviewer, it seems to me it's significant for us to know what the reviewer thinks is required. And what the reviewer thinks they can follow or not follow, depending upon their own discretionary judgment.

And as I understand your statement, you regard appendix R as binding and if you expect to not meet some aspect of it, you would consider you need an exemption or a deviation authorized by the NRC, is that correct?

A. Yes, your Honor.

Q. Conversely, the code we've been referring to, the fire protection code, the '77 version or the '81 version, as a reviewer and expert on fire protection systems, do you regard that code as binding on you?

A. NFPA 30 is cross referenced by the Staff guidelines

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and the FSAR in the applicable codes for the plants listed, is for every code in every FSAR section we do list the year in effect of the respective codes. We are using NFPA codes, we are using an IEEE code, we are looking at ASME codes and we are listing the year in effect we went by. That's why we try to qualify the year in effect which is binding for Shearing Harris.

The Staff does not require for us to use the latest code. If the Applicant opts to go to the latest version they may choose so. But the Staff does not impose on us any more than what we are committed to. At this point the plant has committed to NFPA 30, 1977 edition as listed in the FSAR.

8

9 fls.

Q So at least one purpose of your reference would be when you file an FSAR and you list in a particular section what code you went by, that simply tells the Staff, as a point of information, this is what we followed.

A Yes. At the same time the respective codes have been also accepted by the local authorities on fire protection, by the insurance carrier, and there is also another-- There are two insurance carriers, one for property loss and one for liability, and these insurance companies have not objected to our codes in effect, nor to the fire protection program.

Q So following a code might have an independent reason, I take it, namely satisfying an insurance company, satisfying some county government where the reactor is located,--

A Yes.

Q -- things of that sort.

A Yes.

And there are references in the code which, if you would like, I can show where the code itself, the code itself says that if the authorities having jurisdiction permit a deviation from it or a different fire protection approach for whatever other reason, the code will not be binding, but those decisions and those measures are acceptable.

Q Do these code authorities-- Well, I won't ask you to comment on all code authorities, but fire protection

code authorities, for example, they are, I take it, constantly -- their committees are constantly reviewing these standards and they have discussions and they have meetings and then once every few years they will revise the code --

A Yes, you are right.

Q -- as an outgrowth of all that.

A Yes.

Q Now typically when they made a revision to the code, take the fire protection code, and they upgrade some requirement or change it either way, do they differentiate between provisions that they regard as so important they should be backfit into a design as opposed to changes that they think are probably better but they don't have to be backfitted? Do they address that point?

A They do not address that point. However, historically every fire code which has been updated, it added more conservatism to it. I personally was a voluntary participant at the formulation of NFPA 803, which is the standard for nuclear power plants, Chapter 9 on Detection Systems.

And I personally took part, together with a group of engineers, in developing the table which is presently under the Detection section, with various type of detectors to be provided for various occupancies within nuclear power plants.

And I'll tell you that we used the state of the art a few years ago. So from this experience of mine I know that they become stringent every year.

There is no need for backfitting, no.

Also I would like to add that the National Fire Protection Association Standards and Codes are a general directive to commercial operations, to warehouses, to industrial operations, chemical plants, as you can see, automobile repair shops, dry cleaning plants, and so on.

So the nuclear industry really refers in various sections of the fire protection to a certain NFPA code. For example for the detection there is an NFPA 72 series which gives the type of circuitry to be used, it gives the type of detectors, the spacing and so on.

But in the nuclear industry we do not go by those minimum standards, we go by the best. Our detection spacing is considering a lot more than what the standards are asking for, but we cross-reference to those standards.

Q So are you saying that the industry codes may differentiate on certain things like gas stations which are sort of perhaps unique or unusual in their hazard, but does the code represent an industry view of what the lowest common denominator is on fire protection?

A Yes, there are-- In the code there are-- In accordance with an NFPA official definition in the beginning

of every volume, there are mandatory requirements and there are optional requirements, and or top of this there is latitude left for the authority or authorities having jurisdiction to decide a different approach from the code.

And in our case the authority having jurisdiction which has more bounding on a nuclear power plant would be the NRC.

Q Yes.

But when you-- Just to pick up on another point I think you made, when you say you conformed to code, and specifically the 77 code, generally speaking, do the fire protections built into Shearon Harris exceed the 77 code?

A You mean NFPA 30?

Q Yes.

A In my opinion, yes.

Q Thank you very much.

JUDGE KELLEY: Mr. Eddleman, do you have recross based on what we said?

MR. EDDLEMAN: No, Judge.

JUDGE KELLEY: Okay.

Redirect?

MR. O'NEILL: Mr. Chairman, just to clarify one point that I think Mrs. Serbanescu was trying to make when she referred part of the question to legal counsel, technically Appendix R is not applicable to the Shearon Harris plant

because of the date on which it comes into operation.

But the company, the Applicants have committed to design the fire protection sytem to meet Appendix R, and to go through the process as if it were applicable.

There is a very technical provision as to why it would not apply to this plant. But that was the point that she was referring to.

JUDGE KELLEY: Could you just, referring to "Introduction and Scope," operating prior to January 1, '79-- I'm looking at page 506 of the latest version of 10 CFR.

MR. O'NEILL: Let me get the right page, Judge. I believe that's right.

I'm looking at Section 50.48,--

JUDGE KELLEY: All right.

MR. O'NEILL: -- which discusses fire protection, on page 427 of my edition.

JUDGE KELLEY: Right. Okay.

MR. O'NEILL: And I--

JUDGE KELLEY: Which part?

MR. O'NEILL: B, the first sentence.

JUDGE KELLEY: The first sentence of B? To paraphrase, it says that it applies to all plants operating prior to '79.

What does apply to the new plants then?

MR. O'NEILL: There is no regulation. There is

only Staff guidance and the Standard Review Plan. It is not a law and so to that effect I just want to make that legal point.

JUDGE KELLEY: Thank you. I appreciate that. I'm afraid I misapprehended in that regard. Maybe we can find out from the Staff a little more about that.

MR. EDDLEMAN: Judge, I don't know if this is the appropriate time to bring this up, but I think Applicants' Counsel just contradicted one of his arguments he made to get a ruling yesterday ruling out some of the issue of fires. If Appendix R doesn't apply to the Harris plant as a matter of law, then I think that needs to be argued a little more.

JUDGE KELLEY: Let me come back in just a minute. Let me just see where Mr. O'Neill is.

Do you have redirect?

MR. O'NEILL: Yes, I do.

JUDGE KELLEY: Why don't you go ahead with that, and we'll come back to that point a little later, Mr. Eddleman.

MR. EDDLEMAN: Very well, Judge.

REDIRECT EXAMINATION

BY MR. O'NEILL:

Q Mr. Waters, for clarification, you discussed the number of members in the fire brigade.

A (Witness Waters) Yes.

Q And I believe you indicated there are six members of the fire brigade for each shift.

A In my answer-- In my testimony, Answer 17, on page 9, I stated that a fire brigade will consist of a minimum of five persons on each shift as required by 10 CFR Part 50, Appendix R.

And then on page 10 I say -- quote:

"....plus at least one fire protection technical aide who will provide expert advice and assistance."

That is the sixth I believe you are referring to.

Q Are these the only personnel at the plant who would be available to fight a fire?

A No, there are additional personnel who would be available to assist in the fighting of the fire. Immediately upon responding to a fire, we would have additional people on shift such as radiation and control technicians who would be able to advise as to the radiation concerns in a fire area to assist a fire brigade team leader as he is making decisions about ventilating smoke, et cetera.

It would also have certainly the control room shift foreman who is available to advise under the necessary circumstances.

It would also put into effect if necessary calls to additional people who live close by who could be on their way to the plant to assist and serve as backup to the initial responding fire brigade. These are plant personnel over and

above the volunteer fire company that I referred to in other places in my testimony. They are not--

I think what I would like to clarify is that these six people are not alone in the world handling this event, that even on the back shift situation when there is a minimal number of people, there are still other people around who can assist in the overall program of bringing the fire under control and bringing it safely to extinguish it and still maintain the radiological safety of the personnel involved in the general public.

Q Mrs. Serbanescu,--

A (Witness Serbanescu) Yes?

Q -- would you please turn to page 16 of your August 9 prefiled testimony?

A Yes.

Q AT lines 13 through 16 you make a statement that:

"Each fire area is bounded by barriers with construction to provide a minimum three hour fire rating with the one exception of the emergency diesel generating rooms described previously."

Is this statement incorrect?

A That statement is not incorrect.

Q Then what was the purpose of your October 11th clarification to that statement in Answer Number 7 on page 7 where you discuss certain special doors, air-tight doors,

bullet-resistant doors?

A The purpose was to bring more accurate description between the tested doors and the non-tested doors.

The fire areas were and are bounded by three hour rated barriers or equivalent. The manufacturer is guaranteeing those doors to be of an equivalent construction. Those doors are constructed of a heavier material and of a heavier construction than the regular firedoors. Also, these are special type doors, and I just wanted to be clear for somebody who is not familiar with all the fire protection details about the actual situation.

Q So you were distinguishing between laboratory-tested rated doors and those 24 doors which provide equivalent protection and are not laboratory-tested?

A Yes.

Also I would like to add that it is customary in fire protection engineering to have an opening in a rated barrier providing that the respective opening is within 50 foot or so of an area devoid of combustibles.

Now the emergency diesel generator had a huge big hole and it was-- That's why it stuck in my mind. But there are situations like this which I described further in my supplementary testimony of October 11th which, for a fire protection cognizant person, are acceptable and equivalent of a three hour rated barrier.

But for the benefit of the Board and everybody else, I wanted to bring it to attention.

Q Mrs. Serbanescu, you had one point in your testimony yesterday. I believe the transcript will reflect a discussion took place at transcript page 4485. You distinguished between safety-related equipment, and I believe your example there was such as tornado missile doors, and firedoors which are not safety grade equipment.

A Yes, that's correct.

Q Did you mean to imply that the fire protection system has no safety role?

A No, I did not mean to imply that.

The meaning was that the fire protection is not safety related. However, the fire protection system does have a safety role on the safe shutdown of the plant.

Q Enclosure 1 to the October 10th letter that Mr. Eddleman asked a number of questions about lists a number of fire doors. One of those doors he asked you a question about was door Number 656 on page 3 of 5.

He indicated that the rating of that door was one and a half hours, and by the letters on the legend under "Door type" there appeared to be a discrepancy between a rating of one and a half hours and the construction material as three-hour A-lable type construction.

A Yes.

Q Have you had an opportunity to have this information checked?

A This information was checked, and the check result is in my hands right now. And I would like to say that this door Number 565, the rating has not changed, just the letters for the door type have changed from AB/NSD to D/SD, which corresponds to the rating of the door.

I would like to point out that all the other discrepancies which Mr. Eddleman brought to our attention-- As a matter of fact, the entire attachment has been checked, and we found that primarily the ratings have not changed, the fire door ratings have not changed except for door 838, where the rating changed from one hour and a half to three, and the type letters remain intact.

For all the other doors, the rating remained the same and the door type description by the legend in front of this table have been changed.

Q Mrs. Serbanescu, I think you said these were changes. Would it be more accurate to say these were errors--

A I think they were typos.

Q -- in putting together this table?

A Possibly.

MR. O'NEILL: Mr. Chairman, this is not an exhibit in this proceeding. It was a letter that was submitted to the Staff. Applicants will submit a revision correcting any

typos in this table.

Mr. Eddleman was correct in pointing out an inconsistency and we wanted the record to reflect that.

JUDGE KELLEY: You say it is not in the record now?

MR. O'NEILL: It is not.

JUDGE KELLEY: It is part of the October 10th--

MR. O'NEILL: It is part of the October 10th letter. It is Enclosure 1.

JUDGE KELLEY: And you are not submitting it either? You are just correcting--

MR. O'NEILL: We are not submitting it. We just wanted the record to reflect that correction, and any other changes in this list of doors will be submitted to the Staff with copies to all the parties in the normal course of licensing submittals.

JUDGE KELLEY: Okay.

BY MR. O'NEILL:

Q Mrs. Serbanescu, some questions of Mr. Eddleman regarding page 3 of your testimony on the comment resolution of interdisciplinary reviews, you indicated that your contact at CP&L for resolving such comments was previously Mr. Prunty and presently Mr. Hardy.

Did you mean to imply that either of these individuals had or have final authority regarding design

issues at the Harris plant?

A (Witness Serbanescu) Absolutely not.

I should have said that a CP&L team consisting of the section managers of the Licensing, Engineering and Operations Divisions have final approval authority for changes to the FSAR or the Safe Shutdown Analysis.

Q Exhibit 6-- Applicants' Exhibit 6--

MR. O'NEILL: For the record, Mr. Chairman, I realize I misspoke yesterday, and I would like to make that correction. I indicated at one point that if you look at, for example, I believe 9.5.1-5, which indicates at the top there were revisions of 10/10/84 and the bar was from a previous amendment, that was incorrect.

On pages which show these revisions of October 10, that bar does indeed show the most recent change and not the previous changes. I would like the record to reflect that.

JUDGE KELLEY: Very well.

MR. O'NEILL: One last question on this exhibit.

BY MR. O'NEILL:

Q Mrs. Serbanescu, if you would turn to 9.5.1-9, the last sentence or the last two sentences in the middle of the page,--

A (Witness Serbanescu) Yes.

Q -- there is a statement that all duct work which penetrate fire barriers will be sealed by fire dampers having

their resistance rating at least equal to that on the barrier.

Before that it states that-- Excuse me.

The next sentence states that the fire dampers are UL listed and/or FM approved.

Are there any places in the rest of Exhibit 6 where an inconsistent statement is made?

A Yes.

Q Would you give an example of that, please?

A Just a minute, please. Let me find it.

(Pause.)

End 9

In Appendix 9.5A under the fire hazards analysis, page 9.5A-22, on the first line, fire dampers are not provided within safety related ductwork. That statement should have been deleted. And similar statements exist throughout the fire hazards analysis. It was an oversight on our part for this update for the Board.

There is an FSAR change, an official one, which will take place and we'll take these statements out. The Applicants have committed to provide fire dampers in all the ductwork penetrating fire barriers.

This is a residue from the time where the Applicants were considering removing the smoke or product of combustion or heat versus bottling up the area just as explained in my additional testimony, supplementary testimony and it should come out. It will come out. The commitment is made to have the fire dampers.

Q. So the record should reflect that any inconsistencies in Appendix A were changes that were not yet made but that the statement in your testimony of October 11 and on the page 9.5-1-9 is the correct statement with respect to dampers?

A. Yes.

MR. O'NEILL: No further questions.

JUDGE KELLEY: Thank you.

Anything else, Mr. Eddleman?

RECROSS-EXAMINATION

BY MR. EDDLEMAN:

Q Mrs. Serbanescu, did I understand you to say that all of the discrepancies that we discussed yesterday in enclosure one to the October letter, NLS-84-440, were typos except for 838 -- or 830A?

A (Witness Serbanescu) What I said is that all of the discrepancies which you pointed out between the rating of the door and the door type expressed through various letters under the door type column have been verified and except for the door 838 all of the fire door ratings stay the same and the letters under the door type have been changed except for door 838 where the letters state that the hourly rate was changed from one and a half to three.

Q Okay.

So do the changes of those letters, on the ones where you changed the letters, that bring all those door descriptions into conformity with the fire ratings that are listed in that enclosure?

A Yes.

Q Okay.

Now I believe Mr. O'Neill asked you something about the qualification of the special fire doors and the accuracy of your statement about the three hour barriers or

equivalent.

Is it still true that those special doors have not been tested for their fire resistance?

A. Yes, that is correct.

MR. EDDLEMAN: That's all the question I have, thank you.

MR. O'NEILL: There is one bit of unfinished business, which is to read into the record the changes that Mr. Eddleman and I agreed to on Mr. Waters' testimony, because of the deletion of the issue on simultaneous fires.

JUDGE KELLEY: Do you want to do that? That has been worked out between the two of you, I take it?

MR. O'NEILL: That's correct.

JUDGE KELLEY: Okay. Fine.

MR. O'NEILL: I refer to Mr. Waters' prefiled testimony of August 9th, page seven, lines six through 26 are deleted.

Page eight, lines one through eight are deleted. The first sentence on lines 11 and 12 is deleted. The rest of the answer to that question remains in and provides information that is relevant elsewhere.

Page nine, line 23, delete the words "two simultaneous."

Line 24, delete the word "yes."

Page ten, lines three and four, delete the last sentence beginning with "In my opinion...," and ending with "two simultaneous fires."

Line six, delete "two simultaneous." Line seven, delete the word "yes."

Page eleven, lines 19 and 20 where there is a comma insert a period and delete the remainder of the sentence beginning with "And adequate also...," et cetera.

Those are the changes that Mr. Eddleman and I agreed would not be relevant to the contention as it now stands.

JUDGE KELLEY: Thank you.

I think it is time to let the witnesses -- to excuse them and if we have anything else we can do that.

Mrs. Serbanescu, Mr. Waters, we have completed our questioning process now and we thank you very much for your appearance, your attention and your answers. You are excused.

MR. RUNKLE: Sir, can they be recalled depending on how this other point may re-open the cross-examination of them?

JUDGE KELLEY: I thought -- Hold on just a moment.

I thought the last discussion had to do with questions of the Staff panel, right?

MR. EDDLEMAN: Judge, the point that I was going

to get to was counsel saying that Appendix R did not apply to the Shearon Harris plant and how that affected the question of whether two simultaneous fires was an admissible issue here.

JUDGE KELLEY: I guess I was assuming it was legal argument we were going to have and had nothing to do with the panel. You say it has something to do with the panel?

MR. EDDLEMAN: Well I think Mr. Runkle is right about that.

I would also like to point out I believe Mrs. Serbanescu said this morning she would provide a couple of minor items of information. I don't have any objection to those just being submitted in writing, but -- I mean I am not going to cross of them. But I do want the panel to be able to submit the answers to those questions.

JUDGE KELLEY: Yes. I understood it to mean when a witness says something like that that they will supply it for the record through counsel hopefully fairly soon, but that it does not imply further cross when the information comes in.

MR. EDDLEMAN: I think Mr. Runkle's point about further cross would be relevant if we won the argument -- or if I won the argument. But you know that can certainly wait until the argument is over.

JUDGE KELLEY: Now the argument you refer to is the point that you began to raise earlier and I asked you to defer, correct?

MR. EDDLEMAN: Correct.

JUDGE KELLEY: Well let's hear that now if we can in a few minutes.

And if you would not mind waiting a minute to hear this out, we will see where it takes us.

Go ahead, Mr. Eddleman.

MR. EDDLEMAN: Yesterday as I recall -- I don't have the transcript here, but I believe as part of the argument made about the applicability of the two simultaneous fires provision to Harris, the question was well do the rules require it. And the answer is no and I believe the Board explicitly referred to Appendix R having reference to GDC three and then saying the single fire in Appendix R.

JUDGE KELLEY: We did indeed, right.

MR. EDDLEMAN: Now Applicant's counsel said, in response to this legal question from the Board to Mrs. Serbanescu, that Appendix R didn't apply to the Shearon Harris plant. Now my argument is as follows:

If Appendix R does not apply to the Shearon Harris plant then that piece of that basis for the ruling goes away and I would like to just quote from GDC three, which is unquestionably part of the NRC's rules, and it is from

Part 50, Appendix A, in the current edition, page 465.

Do you have that?

JUDGE KELLEY: Correct. I know what you are talking about.

MR. EDDLEMAN: Okay. It says:

"Structures, systems and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions" -- and it uses the plural.

And it then goes on to state in a later sentence:

"Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires" -- both words plural -- "on structures, systems and components important to safety." And "structures, systems and components is also in the plural.

I think that every reference to what they are fighting there is in the plural, except for the word "fire detection," and even that is in the context of "fire detection and fighting systems," otherwise it is all plural.

JUDGE KELLEY: True enough. Now you did refer to that yesterday, the plural in GDC-3 and we did consider that. We did also say though that we found it persuasive

that Appendix R spoke of a single fire in two or three places.

And now, with Mr. O'Neill's help I have come to realize that Appendix R, having reread it myself, does not apply technically to this reactor.

But with all of that do you want to respond, Mr. O'Neill?

MR. O'NEILL: Yes, sir.

Let me just point out to the Board that criterion four, the next one, which goes to environmental and missile design bases, speaks of loss of coolant accidents. That does not mean that you design against more than one loss of coolant accident, it is just the way those particular criteria are written.

It is true technically that Appendix R does not apply to this plant. It is also true that the Applicants must meet General Design Criterion 3 with respect to fire protection, that the Commission has established -- for at least certain plants -- Appendix R as law on how you go about meeting General Design Criterion 3; that, as yesterday in our discussion, it does talk about for those plants a single fire; that because there is no specific regulatory requirement for the Harris plant we have simply -- Applicants have simply agreed that they will apply Appendix R to that plant as if it were applicable as a means acceptable to the Staff of meeting the regulatory

requirement and General Design Criterion 3.

And indeed the table in Appendix R that talks about single fire is reprinted as well in NUREG 0800 which is the Standard Review Plan with the same analysis of what Applicants must meet.

I don't believe the fact that this technical aspect of the regulation changes the force of our arguments or the force of your ruling of yesterday.

JUDGE KELLEY: A final word?

MR. EDDLEMAN: I think Mr. O'Neill is primarily agreeing with me on the facts, that Appendix R does not apply to the Harris plant, the Commission rulings that he cites do not apply to the Harris plant. And the Standard Review Plan, as I understand it, is not a regulation.

Now the only thing of substance I heard him say was that in Criterion 4 when he mentioned loss of coolant accidents you don't have more than one. But I think that is an artifact of the fact that if you lose your coolant once it is all gone. I don't think that it can be read to say that the plural has to read singular because, if that is true, then all of these other words: structures, systems, explosions and so on, also would become singular.

JUDGE KELLEY: Apart from the grammar of these provisions, which in the absence of some absolutely clear choice of words which forces me to a conclusion, I am

kind of inclined to be affected by what I think is the logic and reasonableness of the whole thing.

Now again, without having any numbers and odds in front of us, I would just take it as pretty unlikely that a really significant fire would pop up in a nuclear power plant in different parts from independent causes at the same time.

And that being so in my mind why should they have fire protection designed against that?

Do you postulate two fires on the same morning at Shearon Harris from different causes? I don't mean in a wastebasket, I mean something serious.

MR. EDDLEMAN: Judge, I couldn't rule it out. I think the problem is that fire protection is for safe shutdown basically. And to guarantee safe shutdown in other respects you certainly have to guard against things that are considered quite improbable -- the probabilities, the Staff says, are down in the 10 to the minus-6, ten to the minus-8 range. And it certainly wouldn't seem to me that it is below the 10 to the minus-8 probability that you could get two simultaneous significant fires at a thing as large as the Harris plant.

JUDGE KELLEY: Neither of us really know, it is just a judgment, right?

MR. EDDLEMAN: That's right.

What I am saying is off the top of my head....

In other words -- well let's look at it this way: 10 to the minus-4, Judge, is once in about 25 or 30 years, okay. I know there have been fires at other nuclear plants, some of which have been significant -- the Browns Ferry fire was certainly significant, okay?

So if you look at that and you say Well the apparent frequency of fires may be one in 30 reactor years, then by that logic, just figuring it out here, if the two fires are truly independent events, each would have a probability of about 10 to the minus-4 based on experience. And 10 to the minus-4 times 10 to the minus-4 is 10 to the minus-8 which is the same order of magnitude that you have to guard against for other safety significant things.

And since you have only got one redundant train protecting against fire -- that is the way this design is set up -- if the other fire happens to be anywhere in that other train, it could take it out.

JUDGE KELLEY: We can't have an evidentiary hearing, obviously, on this point. Can you cite an instance where there have been two significant fires in a nuclear power plant in the history of commercial nuclear power?

MR. EDDLEMAN: No, I can't, Judge, but I don't think I have to show that an event has happened in order to

have a contention about it.

JUDGE KELLEY: It is not an illogical question to ask.

MR. EDDLEMAN: No, sir, it is a good question. And I can't cite an actual instance of it.

Tne Browns Ferry fire was a single fire that spread a good bit.

JUDGE KELLEY: As far as I know, yes.

MR. EDDLEMAN: Okay.

However, I would say that I have just laid out a logical basis for it. And the contention simply says on this point that the firefighting capability for simultaneous fires is inadequate or at least unanalyzed. And I think that some analysis of it is certainly worthwhile and a thing that is within that range of probability.

JUDGE KELLEY: Okay.

Excuse us just a moment.

end#10 (The Board conferring.)

JUDGE KELLEY: We are aware of the fact that the Staff witnesses are going to take the stand here after lunch and they doubtless are conversant with the background of things like appendix R and where it came from and why this appendix was scrapped for more recent plants. And we think we might learn something from that process. We will say at this point it's our tentative inclination -- tentative ruling, if you will -- that we're not going to depart from yesterday's ruling, we're not persuaded that simultaneous fires have to be considered. But we'll leave the door ajar just enough to learn a little from the Staff if we can and we'll finalize that later. But for the guidance of the parties at this juncture, we propose to adhere to a prior ruling.

It's quarter of 1:00. The Board's going to suggest a lunch break until quarter of 2:00.

Oh, I would say that I don't want to leave you in limbo -- were you going to be here this afternoon anyway or are you going to rush for a 1:30 plane?

WITNESS SERBANESCU: We will be here anyway and if need be, tomorrow.

JUDGE KELLEY: Okay. I think it is unlikely you will recalled based on where we are now, but if you're going to be here anyway, we will not worry about it too much. Thank you.

You're excused. You'll be here anyway. If we have

to recall you, we can.

(Whereupon, at 12:45 p.m., the hearing was recessed, to reconvene at 1:45 p.m., this same day.)

AFTERNOON SESSION

(1:50 p.m.)

JUDGE KELLEY: Back on the record.

Following the lunch break, we are turning next to the Staff's panel of witnesses on fire protection.

Mrs. Moore, do you want to make the introductions?

MRS. MOORE: Yes, your Honor. The Staff calls Mr. Randall Eberly and Mr. Robert L. Ferguson.

JUDGE KELLEY: Thank you.

Whereupon,

RANDALL EBERLY

and

ROBERT L. FERGUSON

were called as witnesses and, having been first duly sworn, were examined and testified on their oath as follows:

DIRECT EXAMINATION

BY MRS. MOORE:

Q Mr. Eberly, would you please state your name, position, and business address for the record?

A (Witness Eberly) My name is Randall Eberly. I'm a fire protection engineer in the chemical engineering branch of the Office of Nuclear Reactor Regulation, the United States Nuclear Regulatory Commission, Washington, D.C. 20555.

Q Mr. Ferguson, would you please state your name, position, and business address for the record?

A. (Witness Ferguson) I am Robert L. Ferguson, Section Leader for Fire Protection Section in the Chemical Engineering Branch and the balance of the address is the same as Mr. Eberly's.

Q. Gentlemen, do you have before you a document entitled NRC Staff Testimony of Randall L. Eberly and Robert L. Ferguson concerning Eddleman Contention 116?

A. (Witness Eberly) I do.

A. (Witness Ferguson) I do.

Q. Did you prepare or participate in the preparation of this testimony?

A. (Witness Eberly) I did.

A. (Witness Ferguson) I did.

Q. Do you have any additions or corrections to the testimony?

A. (Witness Eberly) Yes, I have two corrections.

The first being on page 9. On page 9, answer 10, the answer should state, "Yes, it is provided in FSAR section 9.5.1." The correction here being the 9.5.1. It previously just said 9.5. Another one continuing exactly the same.

JUDGE KELLEY: I would note for the record that the Staff has very kindly made these corrections in some copies previously distributed. So we are now simply noting changes from what was filed earlier. But we have these changes that are being given, is that correct?

MRS. MOORE: Yes, your Honor, that's correct. And the copies provided to the court reporter also have these corrections.

JUDGE KELLEY: Thank you.

MR. EBERLY: The second correction occurs on page 14. We omitted several sentences in the second paragraph.

The second paragraph -- I will read the entire corrected paragraph.

JUDGE KELLEY: Okay.

MR. EBERLY: "Inside non-inerted containments one of the above described fire protection means should be provided. If not, cables and equipment and associated non-safety circuits of redundant trains should be separated by a noncombustible rated energy shield having a minimum fire rating of one-half hour or separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet, with no intervening combustibles or fire hazards or installation of fire detectors and an automatic fire suppression system in the fire area."

BY MRS. MOORE:

Q. With these additions and corrections, do you adopt this as your testimony in this proceeding?

A. (Witness Eberly) I do.

A. (Witness Ferguson) I do.

Q. Is this testimony true and correct to the best of your knowledge and belief?

A. (Witness Eberly) It is.

A. (Witness Ferguson) It is.

MRS. MOORE: Your Honor, copies of this testimony have been served to the Board and the parties and been delivered to the court reporter. I move that the testimony and the attached professional qualifications be admitted into evidence and bound into the record as if read.

JUDGE KELLEY: Motion granted.

(The document follows:)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER AND LIGHT COMPANY AND	)	
NORTH CAROLINA EASTERN MUNICIPAL POWER AGENCY	)	Docket Nos. 50-400 OL 50-401 OL
	)	
(Shearon Harris Nuclear Power Plant, Units 1 and 2)	)	

NRC STAFF TESTIMONY OF RANDALL EBERLY AND ROBERT L. FERGUSON CONCERNING EDDLEMAN CONTENTION 116

Q1. Mr. Eberly, please state your name, affiliation and position.

A1. My name is Randall Eberly. I am a fire protection Engineer in the Chemical Engineering Branch, Division of Engineering, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission. I am the Staff fire protection reviewer for the Shearon Harris Nuclear plant.

Q2. Please summarize your professional qualifications.

A2. In 1975 I received a Bachelor of Science Degree in Fire Protection Engineering from The University of Maryland.

I am a registered Professional Engineer in the States of Maryland and Delaware.

I serve on the National Fire Protection Association Technical Committees on Halon Fire Extinguishing Systems and Portable Fire Extinguishers.

During my attendance at the University of Maryland, I was involved in a cooperative program with the United States Coast Guard. I was employed, part-time as a fire protection engineering trainee with the Hull Arrangements Branch, Merchant Marine Technical Division, Office of Merchant Marine Safety, U.S. Coast Guard Headquarters. At that time my duties included the review and approval of fire protection systems and materials for U.S. and foreign flag merchant vessels.

I joined the civilian staff of the U.S. Coast Guard, full-time, in 1975. My duties were expanded to include marine fire protection research, casualty investigation, and I also served as an advisor to the U.S. Department of State for the purposes of negotiating international maritime fire protection and safety regulations. During my employment with the Coast Guard, I was responsible for the review and approval of the fire protection aspects of the Floating Nuclear Power Plants (FNP). I received a High Quality Increase for this work.

In 1982, I joined the U.S. NRC in my present position. My duties include the review and approval of fire protection programs of Nuclear Power plants. I also serve as a fire protection technical expert on Regional fire protection team inspections. Since I have been with the NRC, I have reviewed the fire protection programs of approximately 25 nuclear power plants. I was awarded a Certificate of Appreciation for my involvement in the Appendix R fire protection backfit program.

Q3. Mr. Ferguson, please state your name, affiliation and position.

A3. My name is Robert L. Ferguson. I am the Section Leader of the Fire protection Section, Chemical Engineering Branch, Division of Engineering, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission.

Q4. Please summarize your professional qualifications.

A4. I am a Section Leader in the Division of Engineering. I am responsible for supervising the Staff's review of the safety considerations associated with fire protection programs at nuclear power generating stations.

I received a Bachelor of Science degree in Electrical Engineering from the Illinois Institute of Technology in 1950.

From 1950 to 1956 I was employed at Argonne National Laboratory, Lemont, Illinois. As Associate Engineer, I was responsible for the development of instrumentation, controls, and data handling systems for nuclear reactors, special process loops, and experiments in physics, chemistry, biology and nondestructive testing.

From 1956 to 1959 I was employed at ACF Industries, Washington, D.C. As Manager of the Instrumentation, Control, and Electrical Section, I was responsible for the design of instrumentation, control, and electrical systems for several reactor facilities.

From 1959 to 1960 I was employed at Curtiss-Wright Corporation, Quehanna, Pennsylvania. As Manager of the Reactor Engineering Division, I was responsible for the design of nuclear reactor facilities and the design of components for nuclear reactors.

From 1960 to 1965 I was employed at Combustion Engineering, Inc. As Assistant Project Manager and later, as Project Manager for the High Flux Beam Reactor (HFBR), I was responsible for coordinating the design of the reactor, its shielding and its experimental facilities. As Engineering Supervisor following the completion of the HFBR, I was responsible for directing design studies related to pressurized water reactors, organic cooled D_2O moderated reactors, and liquid metal fast breeder reactors.

In December 1965, I joined the regulatory staff of the U.S. Atomic Energy Commission which subsequently became the Nuclear Regulatory Commission. Prior to my present assignment, which was made in 1977, I was responsible for the development of reactor standards, codes, and criteria relating to reactor safety and for advising other AEC divisions in related reactor safety matters from 1965 to 1971 and as a Senior Project Manager from 1971 to 1977, I was responsible for managing the Staff's review of the safety considerations associated with the design of nuclear powered generating stations.

In 1977, I was assigned the responsibility for developing, staffing and directing the Staff's evaluation of the fire protection

programs at all operating plants. I participated in the subsequent development of all Staff fire protection requirements, the fire protection research program, and design studies of certain fire protection issues. Prior to issuance of Appendix A to BTP-APCSB 9.5-1, I participated in several site visits to determine the potential problems that may be encountered in applying the guidelines of BTP-APCSB 9.5-1 to operating plants and developing suitable alternative guidelines. I have participated in the evaluation of research results and plant incidents for indications of weaknesses in our present guidelines.

From 1968 to 1975 I participated in the American Nuclear Society's program to prepare standards pertinent to reactor safety. I was a member of two subcommittees of the ANS Standards Committee; i.e., ANS-20, Systems Engineering, and ANS-4, Reactor Dynamics and Control. From 1965 to 1970 I participated in the Institute of Electrical and Electronic Engineers' program to prepare standards pertinent to reactor safety. I was a member of the Joint Committee for Nuclear Power Standards and two of its subcommittees; i.e., S/C 4, Auxiliary Electrical Power, and S/C 2, Equipment Qualification.

Q5. What is the purpose of your testimony?

A5. The purpose of our testimony is to address Eddleman Contention 116 which states:

> The fire hazard analysis of section 9.5A (Appendix) in the FSAR does not address the availability of control and power to the safety equipment. In establishing fire

resistance ratings of fire barriers with respect to fires in cable trays, Applicants have not established that qualification tests represent actual plant conditions or comparable conditions. Another vague statement is that fire barriers are used "where practical" without defining practical or stating the criteria to decide where a fire barrier is or is not practical (and what type of fire barrier should be used). FSAR 9.5.1.1.1. The "analysis" of Appendix 9.5A does not demonstrate, as 9.5.1.1.1 claims it will, the adequacy of other fire protection measures in all cases. Rather, it estimates the BTU of combustible material, smoke generation and removal rate from the area, gives usually a qualitative description of some measures to mitigate or reduce fire effects, and assumes that the fire will be promptly detected (usually, no analysis of location of detection instruments, etc.) and the fire brigade will respond rapidly and put out the fire, or the automatic equipment will work. These assertions are made despite the time it takes to get people into the containment and to the fire (not well analyzed). Further, the "analysis" of what happens if the fire spreads is generally a rationalization that it can't spread much, not an analysis. See, e.g. "Analysis of Effects of postulated fires." The effect of a fire in a fire area or a fire zone with a combustible loading greater than 240,000 BTU/sq. ft. doesn't get dealt with in realistic terms. The plant firefighting capability for simultaneous fires is inadequate, or at least unanalyzed.

Q6. Mr. Eberly, have you reviewed the fire protection program for the Shearon Harris facility and, if so, where is that review documented?

A6. Yes. I have reviewed the Shearon Harris fire protection program which is contained in FSAR § 9.5.1, § 9.5A and "Safe Shutdown Analysis in Case of Fire" dated June 20, 1983. The Staff's review of that program is contained in § 9.5.1 of the Staff's Safety Evaluation Report (SER) dated November, 1983. In addition, there will be supplements to the SER dealing with open items identified in that section.

Q7. What is the purpose of the fire protection program.

A7. The purpose of the fire protection program is to ensure the capability to shut down the reactor and maintain it in a safe

shutdown condition and to minimize radioactive releases to the environment in the event of a fire. It implements the philosophy of defense-in-depth protection against the hazards of fire and its associated effects on safety-related equipment.

Q8. What guidelines have been used to review the Applicants' fire protection program?

A8. The Applicants' fire protection program has been reviewed against the guidelines of § 9.5.1 of the Standard Review Plan (SRP) NUREG-0800, Rev. 3, July 1981.

Q9. Why is the fire protection program reviewed against these guidelines?

A9. General Design Criterion 3, "Fire Protection," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 C.F.R. Part 50, "Licensing of Production and Utilization Facilities," requires that structures, systems, and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat-resistant materials are required to be used wherever practical throughout the unit, particularly in locations such as the containment and control room. General Design Criterion 3 also requires that fire detection and suppression systems of appropriate capacity and capability be provided and designed to minimize the adverse effect of fires on

structures, systems, and components important to safety and that fire fighting systems be designed to ensure that their failure, rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components. If alternative designs or methods are used, they must provide equivalent fire protection. Suitable bases and justification should be provided for alternative approaches to establish acceptable implementation of General Design Criterion 3.

SRP § 9.5.1 presents guidelines acceptable to the NRC Staff for implementing this criterion in the development of a fire protection program for nuclear power plants. The guidelines include the technical requirements listed in a number of documents, including Appendix R to 10 C.F.R. Part 50 § 50.48.

To show conformance with GDC 3, a fire hazards analysis is performed by the Applicants which verifies that the NRC fire protection program guidelines have been met or that deviations from the guidelines are justified. The analysis lists applicable elements of the program, with explanatory statements as needed to identify location, type of system, and design criteria. The analysis identifies and justifies any deviations from the guidelines. Justification for deviations from the guidelines which show that an equivalent level of protection will be achieved are usually acceptable to the Staff. Deletion of a protective feature without compensating alternative protection measures will not be accepted by the NRC Staff if it is not clearly demonstrated that the protective measure is not needed because of the design and arrangement of the particular plant.

Q10. Have the Applicants performed a fire hazards analysis (FHA) to demonstrate that the plant will maintain the ability to perform safe shutdown functions and minimize radioactive releases to the environment in the event of a fire?

A10. Yes, it is provided in FSAR §§ 9.5.1 and 9.5A and "Safe Shutdown Analysis in Case of Fire," dated June 20, 1983.

Q11. Mr. Eberly, does the Applicants' FHA adequately describe and evaluate the fire hazards associated with each plant fire area?

A11. I have reviewed the Applicants' FHA to ascertain whether the information provided is sufficient to perform an independent evaluation of the fire hazards in each plant fire area, and to determine if adequate fire protection features are provided to mitigate the consequences of fire in accordance with our guidelines. It is my opinion that the information provided is adequate to perform this assessment.

Q12. What assurance does the NRC Staff need that fire barriers will be capable of protecting cables against fire damage?

A12. Because it is not feasible to test each and every cable tray configuration, the Staff relies on laboratory scale fire resistance tests of fire barrier material in representative configurations of cables and conduits.

Q13. Please describe the fire resistance tests for fire barriers used to protect cables.

A13. The Staff currently accepts fire barriers that have been successfully tested to ASTM Test Method E-119. "Fire Tests of Building Construction and Materials." This test method is a nationally recognized test method developed over 60 years ago. This test method is primarily intended for qualification testing of wall and floor assemblies. This test method is referenced by all national building codes as well as the National Fire Protection Association Standard for building construction.

The tests are conducted at independent, nationally recognized testing laboratories to insure objectivity. The test assemblies which are typically 180 ft.^{2} or larger are mounted in a test furnace and subjected to a standard test fire of carefully controlled extent and severity by calibrating the furnace to reproduce a specific time versus temperature curve. This fire is considered representative of an actual building fire which reaches a temperature of 1700°F in one hour and 1925°F in three hours.

Typically, several cable tray and conduit assemblies of varying configurations are tested. If, after the required exposure time, the protected cables remain free of fire damage, the fire barrier is considered acceptable.

Q14. Is it the Staff's position that these tests represent actual plant conditions or comparable conditions with respect to fires in cable trays?

A14. The Staff considers that these tests provide conservative conditions which envelope actual plant configurations.

Q15. Will the fire barriers to be installed at the Harris plant be tested in accordance with the Staff's recommended qualification test?

A15. Yes. The Applicants have committed to provide fire barriers that have successfully passed the ASTM E-119 test. However, a specific brand of fire barrier material has not yet been selected by the Applicants.

Q16. Will the Staff require the Applicants to submit test reports on the fire barriers chosen?

A16. If a product is selected that has been previously reviewed by the Staff and found acceptable, no further documentation is usually required. If, however a new product is proposed, then we would require the test report to be submitted to verify that acceptable, representative configurations have been tested using our acceptance criteria.

Q17. Do you feel that the Applicants' submittal is vague due to the statement that barriers are used "where practical" without defining practical?

A17. No. This statement is only a general description in FSAR § 9.5.1.1.1. The specific fire barrier locations and qualifications are contained in Appendix 9.5A and the Applicants' Safe Shutdown Analysis.

Q18. What criteria did the Applicants use to determine the location of fire barriers?

A18. The Applicants used the guidance of SRP 9.5-1 §§ C.5 and C.7 to determine where fire barriers should be located.

Q19. Does the Staff accept other alternatives to locating fire barriers in accordance with SRP § 9.5.1 §§ C.5 and C.7 if it is not feasible to erect such barriers?

A19. Yes. For example, in lieu of providing a fire barrier between redundant safe shutdown components in the control room, alternative safe shutdown capability independent of the area is provided. For other areas, a deviation could be requested for a combination of other features, e.g. partial height walls and automatic suppression systems if they provide an equivalent level of protection for the specific configuration.

Q20. How does the information provided in the Applicants' FHA demonstrate the adequacy of fire protection measures utilized?

A20. The Applicants' fire hazards analysis considers the potential in-situ and transient fire hazards in a fire area by calculating the available heat of combustion in BTUs of the available combustibles. This approximates the potential fire severity within each fire area. The consequences of a fire exposure of that potential magnitude are then evaluated in terms of damage to equipment installed in the fire area and the adequacy of the fire area boundaries. If redundant equipment that is required for safe shutdown located in the fire area could sustain damage, then appropriate fire protection measures are provided within the fire area.

Q21. What do these fire protection features for safe shutdown capability consist of?

A21. Our guidelines specify that in fire areas outside of the containment one train of cables and equipment necessary to achieve and maintain safe shutdown should be maintained free of fire damage by one of the following means:

a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;

b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or

c. Enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

If these conditions are not met, alternative shutdown capability independent of the fire area of concern should be provided.

These alternative requirements are not deemed to be equivalent for all configurations. However, they provide equivalent protection for those configurations in which they are accepted.

Inside non-inerted containments one of the above described fire protection means should be provided. If not, cables and equipment and associated non-safety circuits of redundant trains should be separated by a noncombustible radiant energy shield having a minimum fire rating of one-half hour, or separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards, or installation of fire detectors and an automatic fire suppression system in the fire area.

Because it is not possible to predict the specific conditions under which fires may occur and propagate, the guidelines specify the design basis protective features rather than the design basis fires. Plant specific features may require protection different than the measures specified. In such a case, the licensee must demonstrate, by means of a detailed fire hazards analysis, that existing protection or existing protection in conjunction with proposed modifications will provide a level of safety equivalent to the guidelines of § C.5.b of BTP CMEB 9.5.1.

Our general criteria for accepting alternative fire protection configurations are the following:

The alternative assures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control station is free of fire damage.

The alternative assures that fire damage to at least one train of equipment necessary to achieve cold shutdown is limited such that it can be repaired within a reasonable time (minor repairs with components stored on-site).

The alternatives would not be detrimental to overall facility safety.

Q22 Describe the fire protection features for safe-shutdown to be employed at Harris.

A22. The Applicants' Safe Shutdown Analysis is contained in the FSAR § 9.5.1 and the "Safe Shutdown Analysis in case of fire" dated June 20, 1983. The Applicants' letters dated February 24, 1984 and June 12, 1984, provide additional information and clarification of the Safe Shutdown Analysis. The Applicants' report identifies 23 fire areas that comply with § C.5.b of BTP CMEB 9.5.1. Nine fire areas are identified where deviations from our guidelines have been requested.

We have reviewed the fire protection for safe shutdown to verify that one train of cables and equipment needed for safe shutdown will be maintained free of fire damage. Except for the deviations, all plant areas containing cables and equipment needed for safe shutdown are provided with fire protection measures consistent with § C.5.b of our guidelines.

In those areas where the fire protection measures for safe shutdown capability deviate from our guidelines, we have reviewed the Applicants' fire protection measures to determine if a level of safety equivalent to the technical requirements of § C.5.b of our guidelines has been provided; and based on our evaluation, we have concluded that an equivalent level of protection has been provided.

Q23. How are the fire protection features evaluated to determine their adequacy?

A23. These features are evaluated for compliance with our guidelines in § 9.5.1 of the SRP which recommends certain fire protection standards and codes that have been developed and accepted as national consensus standards. The code committees consist of prominent fire protection experts from varying backgrounds. Fire barriers are tested by nationally recognized testing laboratories to a standard fire test, ASTM E-119. Sprinkler systems and detection systems are designed to conform with National Fire Protection Association Codes. (NFPA) The rules for the location and spacing of sprinkler nozzles

and fire detectors are specified in the NFPA codes. The Applicants' have committed to design suppression and detection systems in conformance with this guidance.

Q24. Do the fire protection guidelines in § 9.5.1 of the SRP rely solely on the response of the fire brigade or the operation of automatic extinguishing systems to protect equipment from any potential fires?

A24. No. Fire protection should be considered as a "program." Nuclear power plants use the concept of defense-in-depth to achieve the required high degree of safety by using echelons of safety systems. With respect to the fire protection program, the defense-in-depth principle is aimed at achieving an adequate balance in:

a. Preventing fires from starting;

b. Detecting fires quickly, suppressing those fires that occur, putting them out quickly, and limiting their damage; and

c. Designing plant safety systems so that a fire that starts in spite of the fire prevention program and burns for a considerable time in spite of fire protection activities will not prevent essential plant safety functions from being performed.

No one of these echelons can be perfect or complete by itself. Each echelon should meet certain minimum requirements; however, strengthening any one can compensate in some measure for weaknesses, known or unknown, in the others.

The primary objective of the fire protection program is to minimize both the probability and consequences of postulated fires. In spite of steps taken to reduce the probability of fire, fires are expected to occur. Therefore, means are needed to detect and suppress fires with particular emphasis on providing passive and active fire protection of appropriate capability and adequate capacity for the systems necessary to achieve and maintain safe plant shutdown with or without off-site power. For other safety-related systems, the fire protection program should ensure that a fire will not cause the loss of function of such systems, even though loss of redundancy within a system may occur as a result of the fire. Generally, in plant areas where the potential fire damage may jeopardize safe plant shutdown, the primary means of fire protection should consist of fire barriers and fixed automatic fire detection and suppression systems. Also, a backup manual firefighting capability should be provided through the plant to limit the extent of fire damage. Portable equipment consisting of hoses, nozzles, portable extinguishers, complete personnel protective equipment, and air breathing equipment should be provided for use by properly trained firefighting personnel. Access for effective manual application of fire extinguishing

agents to combustibles should be provided. The adequacy of fire protection for any particular plant safety system or area should be determined by analysis of the effects of the postulated fire relative to maintaining the ability to safely shut down the plant and minimize radioactive releases to the environment in the event of a fire.

Fire protection starts with design and must be carried through all phases of construction and operation. A quality assurance (QA) program is needed to identify and rectify errors in design, construction, and operation and is an essential part of defense-in-depth.

Q25. Does this defense-in-depth concept take into account the time it takes for the response of the fire brigade?

A25. Yes. The Staff assumes that at least 30 minutes is required for the fire brigade to take action.

Q26. How have Applicants demonstrated that they comply with Staff guidance concerning defense-in-depth?

A26. The Applicants have submitted a Fire Hazards Analysis (FSAR § 9.5A) and a comparison (FSAR § 9.5) against the guidelines in SRP § 9.5.1. We have reviewed these submittals for conformance with our guidelines, however, our review is not yet complete. One element of our review requires us to make a site visit to field verify the Applicants' fire protection program. This visit can only be made at a very late

stage of construction when the majority of the fire protection systems have been installed. After we have made our site visit and completed our technical review, we will be able to confirm that adequate defense-in-depth has been provided.

Q27. Should the FHA consider simultaneous fire events in different locations within the plant?

A27. No. Our guidelines in § 9.5.1 of the SRP, page 18 state that "On multiple-reactor sites, unrelated fires in two or more units need not be postulated to occur simultaneously." The Staff also uses the same guidelines to apply to single reactor sites.

Q28. Have Applicants conducted an analysis of the ability of a given type of fire to spread?

A28. To my knowledge, a specific analysis for this purpose has not been conducted, however, the prevention of fire spread is an inherent result of compliance with our guidelines. If the Applicants provide fire barriers, and fire detecting and extinguishing systems in conformance with SRP § 9.5.1 with approved deviations, the Staff accepts that an adequate level of protection has been provided against fire spread.

Q29. Are there any plant areas with a combustible loading in excess of 240,000 BTU's/ft.^{2}? Have they been properly addressed in the FHA?

A29. Yes. The areas identified as having a combustible loading of this magnitude are fire areas 1-D-DTA and 1-D-DTB, the Diesel Generator

fuel oil day tank enclosures, and the buried fuel oil storage tanks in the yard area.

The FHA properly evaluates the fire hazard in these areas. The fuel oil day tanks are provided with three-hour boundary walls, floors, and ceiling, and automatic suppression and detection in accordance with our guidelines.

In the event of a fire in this area, heat detectors are provided which will automatically alarm and initiate the sprinkler system. A manual release for the sprinkler system is also provided. If the sprinkler system does not function, the fire brigade response will serve as a backup.

The buried fuel oil tanks require no specific fire protection features due to their isolated location, and distance from safety related equipment.

Q30. What are the Staff's conclusions as to the adequacy of the over-all fire protection program.

A30. Based upon Applicants written submittals the Staff has determined that an adequate fire protection program will be provided as evidenced by conformance with SRP § 9.5.1, with approved deviations, subject to the following oper items:

(1) alternative safe shut down capability systems

(2) qualification of fire doors

(3) Staff site walk down

MRS. MOORE: Your Honor, I also would like now to mark an exhibit for identification.

JUDGE KELLEY: Very well.

MRS. MOORE: The title of that exhibit is NUREG-0800 U. S. Nuclear Regulatory Commission Standard Review Plan, Section 9.5.1, Fire Protection Program. This exhibit should be marked for identification as NRC Staff Exhibit 7.

JUDGE KELLEY: It is so marked.

(Whereupon, the document previously referred to was marked as NRC Staff Exhibit 7 for identification.)

BY MRS. MOORE:

Q. Mr. Eberly, do you have before you a document -- a copy of the document just marked for identification as NRC Staff Exhibit 7?

A. (Witness Eberly) I do.

Q. Could you identify that document for the record?

A. The document is entitled U. S. Nuclear Regulatory Commission Standard Review Plan NUREG-0800, section 9.5.1 Fire Protection Program.

Q. Do you rely on this document in your testimony?

A. Yes, I do.

MRS. MOORE: Your Honor, I move that this document be admitted into evidence as NRC Staff Exhibit 7.

JUDGE KELLEY: This was previously distributed?

MRS. MOORE: Yes, your Honor. It's been distributed at the time the testimony was filed on August 9, 1984.

JUDGE KELLEY: Thank you.

Motion granted.

(Whereupon, the document previously referred to as NRC Staff Exhibit 7 was received.)

BY MRS. MOORE:

Q. Mr. Eberly, will you please summarize your testimony in this proceeding, the Staff's testimony?

A. (Witness Eberly) Yes, I would like to present a summary of our testimony in response to Eddleman Contention 116.

I have reviewed the information submitted by the Applicant's concerning that fire protection program for the purpose of determining its adequacy and to also review it for conformance with the NRC fire protection guidelines.

My review is currently ongoing subject to the completion of the open items noted in my written testimony.

Based on my review of the Applicant's submittal, my conclusions on the Applicant's programs are as follows:

First of all, that adequate information has been submitted for me to independently review the program for

conformance to the NRC guidelines; secondly, the Applicant's program has been developed using national recognized criteria such as the National Fire Protection Association Codes for Guidance;

Third, the Applicant is proposing the use of appropriate fire barriers to subdivide the plant into fire areas as recommended by our guidelines; and, finally, that the Applicant's program conform to branch technical positions CMEB 9.5-1 with approved deviations and is adequate to provide reasonable assurance that one train of cables and equipment needed to safely shut down the reactor will be maintained free of fire damage.

Q. Mr. Eberly, as a point of clarification, in your summary just referred to in Applicant's submittals does that include the submittals of October 11?

A. No, it does not.

Q. Thank you.

MRS. MOORE: Your Honor, the witnesses are now available for cross examination.

JUDGE KELLEY: I wonder if it might be possible at this point for either Mr. Eberly or Mr. Ferguson to give us a little background on appendix R. We were having some difficulty with the application of that provision and I think initially we were under the impression that it applied to Shearon Harris. And Mr. O'Neill then called our attention

to 50.48 and the first paragraph of appendix R also says it applies to plants that began operating prior to some date in '79.

And we find all this a little confusing, not being that conversant with the background. Can you help us out, as an introductory matter?

WITNESS FERGUSON: Yes, sir.

JUDGE KELLEY: Thank you.

WITNESS FERGUSON: After the Brown's Ferry fire a commission set up a special review group to look at what lessons could be learned. A report was written based on recommendations in that report. The Staff's guidelines of APC --branch technical position, APCSB 9.5.1 were issued and were subject of public comment and so forth at that time.

The same technical information that was in those guidelines was also put out as regulatory guide 1.120 at the same time and subject to the usual public commentaries and review by ACRS and so forth.

Subsequently we recognize that those guidelines were designed for plants which were not yet docketed. The design was fresh and you could use any methods for fire protection deemed appropriate. And so we reviewed several operating plants to see what problems we would run into in adopting and implementing those guidelines on operating plants and plants in late stages of design. And subsequently,

issued appendix A to that, which allowed other alternatives for plants which were far along in construction.

JUDGE KELLEY: Appendix to what?

WITNESS FERGUSON: Branch technical position APCSB 9.5.1.

Then we proceeded to review the operating plants against those guidelines as presented in appendix A. After a two-year period we had reviewed all the operating plants and had a number of unresolved items on those plants. The problem being the amount of control or the way the Commission would exert its will on operating plants. Once a license was granted it is difficult to back with such things.

The Commission decided as a way of resolving those unresolved issues, was to issue a rule. That rule became Appendix R.

So it was originally written for those plants licensed prior to 1979 and issued as such.

As a companion piece of legislation to that, it was paragraph 50.48 was issued and 50.48, in the initial part, applies to all operating plants. That would apply to Shearon Harris equally as well once it becomes an operating plant.

JUDGE KELLEY: You mean subparagraph A?

WITNESS FERGUSON: Yes.

JUDGE KELLEY: Okay.

WITNESS FERGUSON: That would require the plant to

have a fire protection program that was approved by the Staff.

In its proceedings on issuing Appendix R, the Commission raised the question of why this appendix should not be applicable to all plants, even those in the future.

The Staff argued that the technical requirements listed there were applicable to all plants and were, in fact, being implemented in the Staff reviews of plants at those times, based on the implementation of the guidelines.

On that basis, the Commission then expressed concern of how these could be enforced on plants once they were licensed, and the -- well, let me see. Let me go back one step. The Staff argued against issuing a rule that it would apply to new plants on the basis that there was a need for flexibility to discuss those areas that may deviate from the rather prescriptive features of some of appendix R.

And that this was based -- could be handled easily in the discussions of normal licensing and then once the agreements were reached, they could be made more enforceable by putting a condition in the license of the plant and so future amendments to the fire protection program could be done under the license amendment procedure, rather than under an exemption procedure.

And the Commission decided to proceed on that basis.

JUDGE KELLEY: Or under a condition where you have an operating license proceeding like this one if you thought

some feature of Appendix R ought to apply and the licensee disagreed with you and you felt strongly enough about it, you could make it --

WITNESS FERGUSON: Right, we could impose it --

JUDGE KELLEY: -- urge that there be a license condition?

WITNESS FERGUSON: That's right.

JUDGE KELLEY: Thank you, that's helpful to me, very helpful.

CROSS EXAMINATION

BY MR. EDDLEMAN:

Q. Good afternoon, gentlemen. If I might ask first, Mrs. Moore asked you about whether you had reviewed the October 11 submittals. Did those, perhaps, also include the things that are dated October 10. Were they, perhaps, served on October 11?

A. (Witness Eberly) Yes, I haven't reviewed the October 10th information. I got it, as yourself, earlier this week.

Q. All right.

But you didn't have to cross examine on it.

Let me ask Mr. Ferguson, I take it you're the Appendix R expert on this panel, or the one who knows the most about it.

A. (Witness Ferguson) I'll try to answer your questions.

Q. You were with the Staff while all this was going on

that you described to Judge Kelley?

A. Yes,sir.

Q. Were you in the fire protection area during all that time?

A. Yes, I was.

Q. All right.

Is it the Staff's position that Appendix R applies to the Shearon Harris plant?

A. Appendix R does not apply as a legal document to Appendix R -- I mean, as to the Shearon Harris plant, excuse me. The technical requirements in section 3G of Appendix R have been incorporated into the branch technical position BTP, CMEB 9.5.1. And so the plant has been reviewed against those requirements and we state that in paragraph 9.5.1 of our SER, I think the first paragraph in that section, the first one or two paragraphs, shows how we tied those requirements together and reviewed the plant.

Q. Okay.

Is the applicable rule for the Harris plant 10 CFR section 50.48A?

A. Yes. There are other sections of that that I think are equally applicable, but that's the primary one that I was quoting, yes.

Q. Do you have that part of the rule with you?

A. Yes.

Q. Okay.

Part A applies. Let me ask you, does part E of 50.48 also apply to Shearon Harris? I believe it is near the end, if that helps.

A. Yes, it does.

Q. Part E reads, does it not, "Nuclear power plants licensed to operate after January 1, 1979 shall complete all fire protection modifications needed to satisfy criteria 3 of Appendix A to this part, in accordance with the provisions of their licenses."

A. Right.

Q. Okay.

Now, when you talk about license conditions are these included within the term, "provisions of licenses" as you understand it?

A. Yes.

Q. Okay.

So if the Staff decided it was necessary to impose a license condition that would be one of the things that could be done under that subsection?

A. Yes. And right now there is a standard license condition that the Staff does impose. That is,there's a standard license condition which is about three paragraphs -- but it characterizes -- it references the Applicant's submittals describing this program, it references the Staff

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SER's which have reviewed and approved that program and requires that the Applicant implement and maintain that program.

It also goes on to state how changes in that program can be made. Then there is a procedure for if there are special license conditions of the type you mention where there was some dispute between the Staff and the licensee and we wanted to impose the condition which would have to be met and that would be added to the standard license condition.

Q. I see.

So is the standard license condition already accepted for Shearon Harris?

A. I don't think so. I don't think we have sent it through yet.

Q. Okay, but this would be a condition that the staff puts through, not something that this Board would have to deal with, is that right?

A. That's correct.

End 11

12 fls.

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In Section 50.48(b) of the Rules, I believe it is the second sentence there reads:

"Except for the requirements of Sections III.G, III.J and III.O, the provisions of Appendix R to this part shall not be applicable to nuclear power plants licensed to operate prior to January 1st, 1979."

And then it goes on to say:

"To the extent that they are accepted by the Staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCSB 9.5-1, reflected in Staff Fire Protection Safety Evaluation Reports issued prior to the effective date of this rule...."

Am I reading that correctly?

A I believe so.

Q Okay.

Now the effective date of this rule was November 19, 1980, shown at the end of 50.48. Is that correct?

A I believe that is about when it was issued. I believe the effective date was later, around March of 1981.

Q Okay.

But at any rate, some date toward the end of 1980 or March of 1981?

A Yes. It was published as a final rule in November

of 1980 and it became an effective rule I believe it was in February or March of 1981.

Q Okay.

And the Shearon Harris plant of course was not licensed at that time.

A That's true.

Q Okay.

Now these parts that we've been going over here are the rules of the NRC. Correct?

A Yes.

Q And you gentlemen quote General Design Criterion 3 in your testimony, don't you?

A Yes.

Q Is that quoted there in its entirety? We could check it. I just wondered if you knew whether you had reproduced the whole thing.

A (Witness Eberly) As far as I know it is.

A (Witness Ferguson) As far as we know.

Q So you will accept, subject to checking, that it was completely reproduced in your testimony?

A Yes.

Q All right.

Now did the NRC -- the Commission, I mean, ever take the position that Appendix R would be applied to plants licensed after January 1st of '79?

A In the proceeding on Appendix R, they considered whether it should or should not be, and asked the Staff to give them a report and recommendations on that issue, yes.

Q They considered it, but they never actually adopted that position, did they?

A No, they did not.

Q You recommended against it?

A That's correct.

Q And they adopted the rule that's here?

A No, it wasn't-- They had adopted that already and then they went on to consider whether-- I'm getting things mixed up here. I'm not sure which came first.

They considered the question and we objected or recommended against adopting it for plants to be licensed after 1979 on the basis that it was not a complete fire protection rule and that if there was needed to be any deviations from it, if it was made a rule they would have to be evaluated under an exemption process rather than under the normal licensing process.

And since the biggest concern at that time was getting a clear statement of what the NRC requirements were and also having a way of enforcing those requirements once they were met by the licensee, the position of putting the requirements in our guidelines and requiring a specific fire protection license condition was adopted as a method to

proceed.

Q All right.

Are you aware of the commitment that I believe has been discussed here earlier of CP&L to comply with Appendix R for the Shearon Harris plant?

A I am not aware of any written commitment from the licenseee in a letter that says he will comply with the Appendix R.

Q Mr. Eberly, are you?

A (Witness Eberly) I am not aware of a specific commitment, but in my review of the Applicants' program I have reviewed it against Sections III.G, J and O, and they have volunteered to comply with these.

Q Do you understand that Applicants have volunteered to comply with any other parts of Appendix R, to your knowledge?

A Not to my knowledge.

Q All right, sir.

Now the parts that you just discussed, they are the ones that are in Part B of 10 CFR 50.48?

A That's right.

Q Okay.

JUDGE KELLEY: Can I just clear something up? 50.48-B, as I read it, has no application to Shearon Harris whatsoever. Am I right or wrong?

WITNESS FERGUSON: That's correct.

WITNESS EBERLY: Legally.

JUDGE KELLEY: There is no point in talking about B. It only applies to old operating plants.

WITNESS FERGUSON: Yes, sir.

JUDGE KELLEY: Thank you.

MR. EDDLEMAN: I am trying to figure out if I misread the rule there, Judge.

JUDGE KELLEY: I think I did, too, the first time through. It is a very convoluted provision. I found it hard to understand, but when I finally got through, I thought it didn't apply.

WITNESS FERGUSON: If I may characterize what it is trying to say there,--

JUDGE KELLEY: Please do.

WITNESS FERGUSON: -- as I mentioned previously, each operating plant had an SER written which had open items in it. The purpose of Appendix R was to resolve those issues. And Section III.G addresses each of those kind of issues.

What this rule does is, except for the three sections, G, J and O that are identified there, it says that if there is an open item in an SER of an operating plant, then the provisions -- on the day the rule becomes effective, then the provisions of that particular section apply to that particular open item, and the applicant is obliged to meet

that condition.

If in fact it has been resolved in some manner and is so documented in the STaff's SER, then that provision is not specifically applicable to that particular reactor.

With the Sections G, J and O, though, it goes on and those are backfitted to all operating plants, regardless of what the SER had said about those points previously.

JUDGE KELLEY: But the whole of Subpart B applies only to plants licensed to operate prior to January 1, '79, as I understand it.

WITNESS FERGUSON: That's correct.

JUDGE KELLEY: Not Shearon Harris.

WITNESS FERGUSON: Not Shearon Harris.

MR. EDDLEMAN: All right. That is much clearer now.

BY MR. EDDLEMAN:

Q Let me ask: When Mr. Ferguson was referring earlier to commitments that would be put in through the standard license conditions on fire protection, would a commitment, if Applicants make a written commitment to meet Appendix R in any or all respects, would that be one of the things that would be put into this license, the standard license conditions by being part of the correspondence on this matter between the Applicants and the Staff?

A (Witness Ferguson) If he had made such a

commitment and that was given consideration in our review, it would be documented in the SER and then the license condition would refer to the SER, so it would be incorporated by reference in that manner.

Q All right.

But if Applicants used a criterion of meeting Appendix R in preparing their submittals to you -- and by "you" I mean collectively the NRC Staff, not just the two of you -- would your review necessarily be to compare the results with Appendix R?

MRS. MOORE: I'm going to object to the question. I'm not sure it is very clear. Mr. Eddleman talks of a criterion. I'm not sure what he means by "a criterion."

JUDGE KELLEY: Maybe you can restate it.

MR. EDDLEMAN: I will try to rephrase.

BY MR. EDDLEMAN:

Q I believe you gentlemen stated that you performed your review to Staff Exhibit 7, the Fire Protection Program section of the NRC Standard Review Plan.

A (Witness Eberly) That's right.

Q Okay.

Now what I'm asking you is if the Applicants in fact -- and I'm making it hypothetical -- if they in fact had used Appendix R or compliance with Appendix R as the basis for preparing their submittals to the Staff concerning

fire protection, would your review evaluate those submittals by whether the submittals met the specific criteria in Appendix R in addition to this Branch Technical Position?

A (Witness Ferguson) Yes. But in general you wouldn't have Appendix R in addition to the particular Branch Technical Position here, CMEB-9.5.1.

When Appendix R came out in the early part of 1981, there were some plants which were ready for licensing, let's say within a few months, and we went back to those plants and asked them for commitments to the sections of G J and O of Appendix R. In those particular instances, then the license condition would be put in that they had agreed to meet those requirements. And then subsequently they would provide their analysis and that would be reviewed against those provisions of Appendix R.

In the hypothetical case you mentioned, if that was the case that the Applicant said Yes, I'm going to meet Appendix R and provide an analysis that way, then it would be reviewed against that aspect of it.

Q Okay.

But I believe you have already said to your knowledge they have not made such a commitment.

A To my knowledge, the Applicant in this particular case has not made a written commitment to that, yes.

Q Now would it be a written commitment you would

go by in determining the scope of your review?

Perhaps I can rephrase that.

A No. Let me think.

There would have to be a written commitment or we wouldn't do it. A plant being licensed at this point in time, we review against CMEB-9.5.1. If the licensee chose to be reviewed against Appendix A and Appendix R and so stated as a written statement and said that's the way he designed his plant, we would review it against those documents.

Q Okay.

Even in that case would it still have to meet the Branch Technical Position CMEB-9.5.1?

A No, in that particular case if he chose a different set of reference documents, then it would just meet the requirements of those reference documents. In general, the technical requirements are the same.

A (Witness Eberly) If I could just clarify a point, Exhibit 7, which is Branch Technical Position CMEB-9.5.1, that contains the technical requirements of Appendix A and Appendix R. So typically in our reviews in the older plants we give them the option of meeting Appendix A and Appendix R.

Due to the stage of construction on the newer plants, we just refer to the Standard Review Plan.

Q Okay.

Now Harris is not one of those older plants you are referring to there, is it?

A They began their review in accordance with Appendix A. When it got to the review stage we started reviewing it against the Standard Review Plan, so there are parts of each in there. And I guess you could say that we have reviewed it against the strictest requirement governing in the case.

Q Now was there ever a written commitment to meet Appendix A that was involved in your review, a written commitment from the Applicants?

A I would not know.

Q All right.

Let me ask you this about Staff Exhibit 7, the Standard Review Plan section on Fire Protection.

Down at the bottom of that cover of that exhibit, the first page of that exhibit, there is a good bit of -- I wouldn't call it quite fine print but there is some smaller bold-faced type down there, is there not?

A Yes, there is.

Q And in about the third sentence, if I'm able to read this correctly, it says:

"Standard Review Plans are not substitutes for Regulatory Guides or the Commission's Regulations

and compliance with them is not required."

Did I read that correctly?

A That's what it says.

Q And that will be true of all parts of the Standard Review Plan, including this one?

A Yes.

Q So to get a license, what the Harris plant has to meet is really the Commission's regulations, not just this plan. Is that not right?

A (Witness Ferguson) It does have to meet the Commission's regulations, yes.

One thing with the statement you read, it is a little misleading. That is sort of a boilerplate statement which is on all Standard Review Plan sections.

One different thing about fire protection is as part of the proceeding we mentioned before where the Commission was considering a rule, their directive to the Staff was to be sure that all plants were reviewed against these requirements and any deviation from these plans be identified and evaluated in the SERs, and then the license condition be added at the time of licensing to assure that they are enforceable.

Q Now does that general license condition also apply to the commitments made in Applicants' fire protection plans and designs as to how they are going to do things?

A Yes, it does.

Q Okay.

If the Applicants made a written commitment to comply with Appendix R in respect to fire protection for the Harris plant, would that commitment become binding on them only by incorporation in this general license condition or some special license condition?

MRS. MOORE: Your Honor, objection. It calls for a legal conclusion on the part of the witness.

JUDGE KELLEY: Well, we've been sort of on the margins of legal conclusions for the past half hour, but there is some reason for that. There has been a lot of discussion about it. I do think, however, the last question trenches pretty close to something you can't really expect these witnesses to speak to.

MR. EDDLEMAN: Well, let me try to ask it a different way.

JUDGE KELLEY: You can try it again.

MR. EDDLEMAN: I will withdraw the question and ask something similar, I hope.

BY MR. EDDLEMAN:

Q Any commitments as regards fire protection programs from the Applicants in this case, would the common Staff practice be if you wanted to make those binding on them to incorporate it either by reference or directly into

the general license condition that you have spoken of?

A (Witness Ferguson) Standard practice would be if a commitment was made, the commitment stands on its own and would not necessarily be -- have a license condition associated with it.

It is only in the case of fire protection where those have been incorporated into a special license condition.

Q Okay.

Well, let me ask with respect to fire protection.

Commitments made by the Applicants as regard their fire protection programs, would it be your standard practice -- I mean your fire protection review part of the NRC, the Chemical Engineering Branch, to make those commitments part of the general license conditions for the Harris plant?

A By reference. It would just be referenced among his submittals to us.

JUDGE KELLEY: What do you mean by "general" license condition? I don't know what the word "general" means in this context.

WITNESS FERGUSON: We have standard wording for a license condition which essentially references where the licensee in his documentation has described his fire protection program and where the Staff has evaluated and approved that program, so we get those into the license and say that he will implement and maintain his fire protection

program in accordance with the description of those documents.

JUDGE KELLEY: But this is a condition that pertains only to fire protection as far as you know?

WITNESS FERGUSON: Yes.

JUDGE KELLEY: Thank you.

BY MR. EDDLEMAN:

Q By incorporating it by reference into that license condition, it would then become enforceable if the plant were operating?

A (Witness Ferguson) Yes, it would.

JUDGE KELLEY: I think it is useful to get this kind of framework. I think there should come a point pretty soon where we should start asking questions about whether the fire protection system at Shearon Harris is adequate or not.

MR. EDDLEMAN: I've completed that line, Judge. Your timing is excellent.

BY MR. EDDLEMAN:

Q Mr. Eberly, the first part of this joint testimony I believe talks about your experience.

A (Witness Eberly) Yes.

Q The cooperative program with the Coast Guard that you refer to at the top of page 2, was that like engineering cooperative education where you work as part of your academic requirements?

A Yes, it was. You go to school for a semester and on alternatve semesters you work for a company.

Q And in this case you worked for the Coast Guard?

A That's right.

Q Okay.

When did you work on the floating nuclear plants that you refer to in the middle of that page?

A I don't recall an exact date but I believe it was around 1975 to 1976.

Q That was before those things went through NRC licensing?

A No, it was during.

Q It says in the third paragraph that your duties with the NRC since 1982 include the review and approval of fire protection programs at nuclear power plants.

Has there ever been one that you disapproved?

A Well, I guess to clarify, when we receive a submittal, it is my job to go through and to make sure that it is adequate, and I have, in cases where people have proposed fire protection that was either inadequate or inappropriate, at which point we either required them to meet our guidelines or to propose some alternative.

Q So you would not approve, in your job, anything that was inadequate or inappropriate?

A That's correct.

Q The Appendix R fire protection backfit program that you talk about down at the bottom of that, I gather that does not apply at all to Shearon Harris.

A No. What I was talking about there was we had I believe a commitment to complete all of the NRC review of operating reactors by the end of 1983, and what I was referring to there was my review of those plants.

Q Okay.

Mr. Ferguson, if I may just go to the beginning of page 3, the testimony that turns to your qualifications.

End 12

Q Mr. Ferguson, if I may just go to beginning on page three of the testimony, it then turns to your qualifications.

In the various work experience you list on page three, was any of that in fire protection?

A (Witness Ferguson) No.

Q If we turn over to page four, was any of your working with Curtis Wright having to do with fire protection?

A No.

Q How about with Combustion Engineering?

A No.

Q Okay.

With the NRC, when did you first become involved with fire protection?

A In about 1977.

Q As stated at the bottom of page four?

A Yes.

Q When you were a senior project manager from '71 to '77, was Browns Ferry one of the plants that came under the reviews that you managed?

A No.

Q Now as to Eddleman Contention 116, as it is stated on pages five and six, let me begin by asking you gentlemen, either of you, or both feel free to answer, does the fire hazard analysis of Section 9.5A, Appendix, in

the FSAR address the availability of control of power to the safety equipment?

A. (Witness Eberly) If you limit your question to strictly Section 9.5A, I would have to go along with what we heard earlier today, that not directly. The availability of control and power to the safety equipment is covered in the safe shutdown analysis.

Q. How, if indirectly, does 9.5A address the availability of control and power to the safety equipment?

A. Well I would have to explain it on the basis that I did my review.

There are three documents that the Applicants have provided: FSAR Section 9.5.1, it is Appendix 9.5A and the safe shutdown analysis. Those are the names of those documents as they have called them. I look at the entire thing as a fire hazards analysis of the Shearon Harris plant. And in that analysis they have addressed fire protection for safe shutdown.

Q. All right.

But my question was how, if indirectly, does 9.5A address the availability of control and power to the safety equipment?

A. 9.5A, I believe, refers you to the other two documents and it also talks about fire barriers provided for each area.

Q. Now the fire barriers around the areas don't necessarily protect the control or power of cables passing through those areas, do they?

A. That's correct.

Q. All right.

Now with respect to the next part of the contention which begins, just the last three words on page five, I believe:

"In establishing fire resistance ratings of fire barriers with respect to fires in cable trays, Applicants have not established that qualification tests represent actual plant conditions for comparable conditions."

In your review have you established whether the qualification tests for cable in cable trays at the Harris plant represent actual plant conditions?

A. The Applicants have committed to provide one hour rated fire barrier for the cable trays and, in conjunction with that, they would be providing one as referenced in my testimony.

If you will give me a second I will point out the question and answer.

It would be question 14.

Q. All right, sir. Let me take a look at that. That's

on page -- the bottom of page 10?

A. Yes, it is.

Q. All right.

Now let me ask you again the original question then because I don't think that quite covers it. The answer is very short, it's just two lines, right, answer 14?

A. That's right.

Q. Okay.

The question is have you, in your review, established that qualification tests for the cables and cable trays at Harris with respect to fires in cable trays represent actual plant conditions at the Harris plant?

A. We have a test criteria that we utilize for the approval of fire barrier materials and the Applicants have committed to meet that test criteria.

Q. That is still not in answer to the question I asked, I don't think. Let me try one more time.

A. (Witness Ferguson) May I try it to add something and then go ahead with your questioning?

Q. Yes, sir.

A. When we first started looking at this kind of thing in 1977, there were no qualification tests for certain things, cable penetration being one of them, and what has now become known as cable tray barriers or cable wrap, that sort of thing. We had some studies made of

what sort of tests were performed on materials being rated for fires and how did these relate to conditions which actually occurred during fires. We had some research programs looking at different types of testing and what they meant and that sort of thing. We also did some actual fires, some cable tray fires and that sort of thing.

Based on this experience over three or four years, we accepted the ASTM E-119 time-temperature curve as being a conservative representation of a fire that you could expect in a nuclear power plant as adequate for showing the qualifications of something to withstand fires.

Most of the rooms in the plant have a lower fire loading and they are bigger volumes than the rooms under which the time-temperature curve was expanded for and we feel it is a conservative representative of fired envelope conditions. But we did not make any specific determination on Shearon Harris, we sort of did it across the Board.

Q. All right.

In this answer you are addressing something that is broader than cable per se, you are talking about the applicability of the E-119 time-temperature curve?

A. That's right, to anything to be tested for fire rating. In other words, what we do now is for fire -- let's say for a one hour barrier around a tray, we would expect it to be exposed to that time-temperature

curve and have the temperatures inside -- if it is going to be an hour rating -- to be down below 325F.

Q All right.

Let me try to back up one more time.

As to the cable trays themselves, do the qualification tests done on the cables or cable types, including the insulation types used at Harris represent actual plant conditions or don't they?

MRS. MOORE: Objection, your Honor, I believe that the contention goes to fire barriers for fires in cable trays, and Mr. Eddleman asked about the cables themselves.

MR. EDDLEMAN: Well I will expand it then to go to the barriers.

JUDGE KELLEY: I thought I was with you there and now I am not sure.

I must say the question about whether this represents actual conditions I thought was answered when the gentleman said they developed this test and accepted it.

They don't go out and burn cables for Shearon Harris, that's clear, isn't it?

MR. EDDLEMAN: Well I know that. What I was asking was I think his answer was that this time-temperature curve was accepted for fires occurring at nuclear plants and I want to ask him some more things about that but first I wanted to wrap up this cable thing and say Did you

explicitly, on the tests that were done on the cables and fire barriers--not the time-temperature curve but the tests themselves--when you exposed this thing to a fire, was that done under conditions that represent actual plant conditions to be encountered at Shearon Harris or not; that's what I was trying to ask him.

JUDGE KELLEY: All right. I will allow that.

WITNESS FERGUSON: My question was directed toward the general condition of barriers. I will let Mr. Eberly speak about what specific test information we have on Shearon Harris.

WITNESS EBERLY: In trying to answer your question, Mr. Eddleman, I guess -- Let me try this:

What the Applicants have done is committed to provide a one hour barrier, which the NRC has established envelopes actual plant conditions for any nuclear power plant.

WITNESS FERGUSON: May I add one thing?

Is it true that the Applicant has not provided any test data for the barriers now that he proposes, is that correct?

WITNESS EBERLY: Yes, they have not selected a specific barrier yet but they have provided a commitment.

BY MR. EDDLEMAN:

Q All right.

So until -- Like the barrier, you won't know whether that barrier has been tested or not or anything like that you have to wait and review that when it comes in?

A. (Witness Eberly) That is also covered in our written testimony, if I can refer you to another question.

Questions 15 and 16 on page 11.

Q. All right.

Let me ask you about answer 16. You refer to products previously reviewed by the Staff.

Does the Staff review of these products include audits of the qualification tests for them?

A. We require them to submit the test report and we review it.

Q. All right.

But the question I asked was slightly different: Does the NRC Staff conduct audits of these tests or test facilities where these tests are done?

A. Are you asking do we actually go and witness the tests?

Q. That's part of it.

A. We haven't thus far.

Q. All right.

A. (Witness Ferguson) I would like to add we have witnesses some tests. We don't necessarily witness all tests.

Q Okay.

Have you witnessed any tests of the fire barriers that you refer to here, the ones that have been found acceptable for fire barriers at nuclear plants?

A (Witness Eberly) No.

A (Witness Ferguson) Some members of the Staff have witnessed some tests that have been found acceptable.

Q Well I am trying to see what that refers to.

Was that tests of fire barriers, sir?

A Yes. Since 1977 people have been developing the tests and different penetration designs, seal designs and that sort of thing.

As they developed these they came in and talked to the NRC as far as what are our acceptance criteria, sometimes to give us proposed tests to see whether we are in agreement so that when they want the tests run we are willing to support the results and that sort of thing, and at times we are invited to witness the tests if we choose. And as I say in some cases we have done that, in some cases we have not.

Q All right.

Now I believe you are speaking of the tests on fire barriers for cable here.

A We have witnessed tests of fire doors, penetration seals, cable wraps -- I think that covers most of the things.

Q Okay.

Now witnessing a test is a little different than I originally asked about audit.

Do your people from the NRC Staff actually check the calibration of instruments, check the laboratory procedures, check the records of these laboratories in connection with these tests?

A I'm not sure. That sort of thing would come under a vendor qualification program which would be done under a different office than us.

Q Do you, the NRC Staff --

A Let me add: when I spoke of witnessing tests and that sort of thing, I was not speaking of that sort of thing. It was a matter of reviewing the test procedure and perhaps being there when the tests were run and looking at preliminary results and that sort of thing.

Q That's why I asked you the next question, to clarify the difference.

Does the NRC Staff have any program to verify that a product is actually made to the same standard as the test sample that was qualified?

A As a general practice we are relying on the Applicants' QA program to do that, and the audits of the QA program again would be done by the regional offices.

Q So specifically as far as your office is concerned,

you would not be involved in that?

A. No.

Q. Okay.

Can either of you gentlemen tell me is there a schedule for when Applicants intend to select fire barrier material for Harris?

A. (Witness Eberly) No, I don't know.

A. (Witness Ferguson) That would be the Applicants' schedule, we have no control over that.

Q. All right.

Do I take it that the question and answer 15 apply to all kinds of fire barriers at Harris, that is, not just the cable ones but for fire areas, cable wraps and other applications of fire barriers?

A. (Witness Eberly) The last sentence that says a specific brand of fire barrier material is referring to cable wrapping materials.

Q. Have the Applicants selected and informed you other fire barrier materials in use at Harris?

A. No, they haven't selected and informed us other than the fact that, you know, when they are using a three hour barrier typically they are using concrete as the material.

Q. Okay.

But other than concrete, they haven't submitted

any material specifications or brands to you for other fire areas?

A. Right. We normally don't go into that level of detail.

Q. Well do you mean to say that if there is a statement All the fire barriers around this area are three hour barriers, that you don't check what materials those things are?

A. Not necessarily.

Q. All right.

Have you in fact done such checking at the Harris plant?

A. No.

Q. All right.

Mr. Ferguson, I would like to come back to when you were talking with me about the qualification envelope and the E-119 time-temperature curve before.

Just for clarification, have you gentlemen seen Mrs. Serbanescu's and Mr. Waters' testimony for the Applicants?

A. Yes.

A. (Witness Ferguson) Yes.

Q. Is that E-119 time-temperature curve the same one that Mrs. Serbanescu lays out in her testimony?

A. (Witness Eberly) That's right.

A. (Witness Ferguson) I would assume so but I didn't check those temperatures that were listed in hers against it, but I assume so.

Q. Mr. Eberly, did yc check them?

A. (Witness Eberly) No, I didn't specifically check the accuracy of the numbers.

Q. But it is the same thing that is being referred to?

A. Yes, we are both referring to ASTM E-119.

Q. And if we wanted to know if the numbers were right we would just compare that actual standard with the testimony?

A. That's right.

Q. Okay.

Does the Staff consider the temperature at which various materials burn in establishing or considering the acceptability of that time-temperature curve for nuclear power plants?

MRS. MOORE: Your Honor, I object. I don't think the question is terribly clear. Are we talking about Shearon Harris or all nuclear plants? I don't understand why --

JUDGE KELLEY: I thought we were talking about the time-temperature curve.

MR. EDDLEMAN: Well when Mr. Ferguson said it I think he said that they established that this applied to

all nuclear plants. So I was going to start there and then get more specific as we got along.

JUDGE KELLEY: Well I thought we had been there once. But give it a try.

MR. EDDLEMAN: Let me try again here.

BY MR. EDDLEMAN:

Q. Let me first ask you a little distinction so we don't confuse the word "burn," or if we do, we make my confusion clear.

There is a temperature at which a material will ignite, flammable materials typically right? There is a typical ignition temperature of that material.

And then usually would there not be a different and higher temperature which would be the flame temperature of that material burning freely in air?

A. (Witness Ferguson) Yes.

Q. Okay. Now I want to ask you about the second kind of burning temperature, the flame burning in air.

When the NRC was looking at the time-temperature curve of ASTM E-119, did you consider the flame temperatures of various materials in nuclear power plants in making that comparison?

A. We did some general studies of looking at the materials in the plants and whether you could in fact generate higher temperatures, for instance, if you are

burning hydrogen, that sort of thing.

We felt that -- it was no formal study but it was just a matter of looking at such things and what kind of plant temperatures you get and what kind of room volumes you have and so forth. And based on those we felt that the E-119 time-temperature is conservative.

There was a concern in the early days of things like oil fires, gasoline fires and so forth where you have things enmeshed in those particular temperatures, failure of structures and so forth. But you don't have too much of that in a nuclear plant.

Q. But there would be a concern if something were enveloped in flame?

A. If you have an unusual circumstance certainly you would have to consider that.

Q. The E-119 time-temperature curve, as I understand it, was validated by actually burning some structures with wood inside them.

To your knowledge has the NRC or the National Bureau of Standards or any insurance underwriters or anybody else ever burned up a typical nuclear plant fire area to see what the time-temperature curve is? I mean, a simulated one, not an actual nuclear plant?

A. No, the closest we have done to that is we have done some mock-ups of certain portions of that, small rooms

and that sort of thing. And in small rooms we have gotten -- with cable fires and heptane, we have achieved rapid rise times up to 1000 to 1100 degrees and that sort of thing. But we haven't really reproduced the E-119 time-temperature curve yet.

And in most of those fires in bigger rooms, which are more representative of the type of rooms you find in a nuclear power plant, we haven't even come close to those temperatures except in the localization of the flame.

Q. Okay.

Now the fire protection requirements of the NRC do require you to provide protection against a localized fire in a fire area as well as one that engulfs the whole fire area, don't they?

A. Fire protection requirements that we have -- let's say for instance a one hour fire barrier and the sprinkler system within a fire area--I think we would assume that you would not have a fire that was engulfing the whole area.

Q. But that is not quite the question I asked you. Let me ask you again.

The standards of the NRC, including your review standards in Staff Exhibit 7, do require the ability to control fires that take in only a part of a fire area, too, do they not?

A. Yes.

Q Okay.

As to the statement in Contention 116, "fire barrier used where practical," what criteria are stated in FSAR Section 9.5.1, to the review gentlemen's knowledge, as to where a fire barrier would be practical?

A (Witness Eberly) Excuse me, did you say FSAR Section 9.5.1.1.1?

Q I just had one "1" there. The basic statement comes from 9.5.1.1, but I asked you a slightly different question.

A Okay. I just wanted to clarify.

Q Where in 9.5.1, the whole thing, is that laid out?

A Okay. It is primarily laid out in the safe shutdown analysis.

Q Not in 9.5.1 et al.?

A Well there are some parts in there where they talk about fire area boundaries, but you are more concerned about the protection of safe shutdown equipment I believe?

Q Well what I am asking you is: you talk about "fire barriers being used where practical." That language, I believe, does appear in 9.5.1.1; it did when this contention was formulated. Does it now?

A That's correct.

Q Okay. Now in 9.5.1, the sort of descriptive overview,

are there definitions of "practical" as regard to where fire barriers may be used?

A. I don't believe there is a definition of "practical." There is a description of the entire fire protection program that shows where they are used.

Q. All right.

Now as to criteria in FSAR 9.5.1 inclusive, do those appear in that part of the FSAR for where it is practical to use fire barriers?

A. Well I guess the way I would have to address that is that the Applicants have taken our guidelines and where our guidelines recommend putting in a fire barrier they have tried to do so and, due to construction problems or other problems, if they couldn't put the fire barrier in then they had to come up with some equivalent form of protection. And I guess indirectly that is where the words "where practical" mean.

JUDGE KELLEY: I guess I'm not clear, Mr. Eddleman, what difference it makes; what part of the FSAR an element such as "where practical" gets defined or where the criteria are. I suppose it isn't in 9.5.1 but it is in the safe shutdown discussion. And the reviewer knows about these things and he knows where to find it. What difference does it make?

MR. EDDLEMAN: It doesn't make any difference and

I am going to go on to ask him about that.

JUDGE KELLEY: Excuse me?

MR. EDDLEMAN: It does not make any difference and I am going to go on to ask him about that. But I am going to the wording of the contention first.

JUDGE KELLEY: Well the contention -- I think it is confusing to have questions about where is this found in such and such a section where the man has already said it is in another section. If we can agree it doesn't matter, why don't we just move on?

Maybe you want to comment but I am puzzled about the utility of that line of --

MR. EDDLEMAN: Well maybe I am not getting the question out but I am trying to ask him -- I had not heard him say it wasn't in there.

JUDGE KELLEY: The contention alleges that it is not there, right?

MR. EDDLEMAN: Correct.

JUDGE KELLEY: But he did say it was over in the safe shutdown part, I thought, right? That's where you would find it.

I think that is what you said.

WITNESS EBERLY: What I was saying is there is no specific paragraph that says This is our criteria for designing where it is practical. In the safe shutdown

analysis it shows you where the fire barriers are and you have to go to it and evaluate it. It is as simple as that.

JUDGE KELLEY: And you infer that the Applicant at least thinks it is not practical to put it some other place, is that right?

WITNESS EBERLY: That's correct.

JUDGE KELLEY: Okay.

MR. EDDLEMAN: All right.

BY MR. EDDLEMAN:

Q. Now in the safe shutdown analysis does it describe the practicality of fire barriers there?

A. (Witness Eberly) Not directly. If I could give you a hypothetical example: they may have two redundant air handling units and due to their location it may not be practical to erect a three hour barrier between them because of the thickness of a three hour barrier. So therefore they would put in a suppression system or perhaps a one hour barrier perhaps instead.

Now that is how they will address the practicality of erecting a fire barrier.

Q. Okay. Well you have given me a hypothetical example.

But in your testimony don't you say that you have reviewed this submission in the safe shutdown analysis?

A. That's right.

Q. All right.

Can you give me an actual example from the safe shutdown analysis?

A. An exact example of what? Run that by again.

Q. Well I didn't ask you an exact example, I said an actual example.

A. Okay.

Q. What I am saying is in your review of this safe shutdown analysis, that's where you say that practicality of these fire barriers shows up directly or indirectly.

A. Right.

Q. Okay.

And I think you said it is indirect, correct?

A. Correct.

Q. Okay.

Now what I am trying to get at is can you show me or tell me an actual example in that safe shutdown analysis of such an indirect indication of practicality?

A. Okay. I understand your question.

Yes, I can. The control room is an example. They have redundant equipment in the control room and it is not practical to erect a fire wall in the middle of the control room. So to address that they put in the remote shutdown panel at another location.

Q. That remote shutdown panel in another location

is not a fire barrier though, is it?

A. No, but it achieves the same end.

Q. Okay.

That is an alternative method of meeting the criteria?

A. That's right.

Q. It is not a fire barrier.

JUDGE KELLEY: How about taking 10 minutes at this point?

MR. EDDLEMAN: Fine.

(Recess.)

JUDGE KELLEY: Back on the record.

Do you want to resume?

MR. EDDLEMAN: Do we know yet what the situation with the sound system is going to be this afternoon?

JUDGE KELLEY: I didn't hear anything back.

MRS. FLYNN: I think we scared him.

JUDGE KELLEY: I guess we are hoping we can use it until 6:00. If he comes in earlier and has some compelling need then I guess we can consider it.

Go ahead.

BY MR. EDDLEMAN:

Q. The fire hazard analysis that appears in Section 9.-- Appendix 9.5A of the FSAR, is there other fire hazard analysis in the documents that you reviewed from the

power company?

A. (Witness Eberly) Like I explained earlier, I tend to look at all three documents, 9.5A, 9.5.1 and the safe shutdown analysis as a fire hazards analysis.

Q. Let's see if I can refer to the document itself for a moment. I am going to use Applicants' Exhibit 6 here, which I think is the latest version.

In the version I have here, the green-bound thing, about a quarter or a third of the way through there is a cover sheet entitled "Appendix 9.5A, Fire Protection Hazards Analysis." Can you locate that?

A. Can you give me a page before or after?

Q. The page before it is a blueprint, Figure 9.5.1-5.

A. Okay. Thank you. I have it.

Q. Okay.

Now this is the Appendix 9.5A that we are discussing here, right?

A. That's right -- well it is the revised version of it, yes.

Q. The revised and almost ready to go into the FSAR version? The revision is as of October 10 and I think you already stated that you had reviewed the revisions of October 10.

A. That's correct.

Q. Now the analysis that occurs here -- well, for

example, the very first one "Fire Area 1-C," on page 9.5A-1, it consists of an identification of fire areas and fire zones, what figures it is shown on, the height, the diameter, the area in square feet, the volume; as to occupancy it says what things are in it -- or I guess principal safety related equipment in it, boundaries, Part 4 is combustible loading. It then gives a summary of combustible loading then it has a section "Control of Hazards," a section on fire detection and a section on access and initial response.

MRS. MOORE: Your Honor, may I ask, does the witness have the appropriate pages?

WITNESS EBERLY: Yes, I am following.

MRS. MOORE: All right. Thank you.

MR. EDDLEMAN: I am now on page 9.5A-9.

BY MR. EDDLEMAN:

Q -- a description of the fire suppression system and then in Part 9, "Analysis of Effects of Postulated Fires."

Then after that analysis following through Item 10, the fire area equipment, there is a list. And that is the last item in this one, right?

Per your review of earlier versions of this appendix, that is a pretty standard layout for the fire hazard analysis of 9.5A, isn't it? Because most of the items have the same kind of discussion in it?

A. (Witness Eberly) Yes.

Q. They cover the same thing.

To your knowledge are there any NRC requirements as to smoke removal rate from fire areas?

A. As applied to the Harris plant, in reviewing it against Branch Technical Position CMEB 951, we do have a requirement that they analyze the need for smoke removal.

Q. How do you interpret that "analyze?" I mean, would it be enough to say, for example, We don't think we need smoke removal, or would there be some analysis of how much smoke could be generated in the area required?

A. It will be up to the Applicant to make the case of whether their normal HVAC system is capable of doing it, whether they need to provide additional venting capability, portable fans or whatever.

Q. All right.

With respect to the capability of HVAC for smoke removal, are you familiar with the supplemental testimony of Mrs. Serbanescu filed on October 11?

A. I am.

Q. Does it discuss this change in fire protection philosophy for smoke removal at the Harris plant?

A. Yes. I noted there is a change concerning the installation of fire dampers in the HVAC network.

Q. And what is that change?

A. Would you like me to refer to her testimony?

Q. Well no, I am just asking you to describe in general what it is. What is the change they made?

MRS. MOORE: Objection, your Honor, the testimony is in the record and it speaks for itself.

MR. EDDLEMAN: All right. Forget it.

BY MR. EDDLEMAN:

Q. Let me ask you this:

Did you hear Mrs. Serbanescu testify over the last day and a half or so?

A. (Witness Eberly) Yes.

Q. Do you recall whether the fire dampers now planned for installation at Shearon Harris were stated to be designed to totally close off the HVAC ductwork when they were activated by the fusible links?

A. I believe that was Mrs. Serbanescu's testimony.

Q. Okay.

Do you know of other nuclear plants that have such a system that are operating now?

A. I would say the majority of them do.

Q. And so this is the type of system that the NRC has approved at other plants?

A. That's right.

A. (Witness Ferguson) Could you clarify that question a little bit for me, the point of fire dampers? I'm sure

that other plants have fire dampers, but the question of whether fire dampers totally close off ventilation.

Q. All right. Well let me ask that question.

Do the fire dampers at other nuclear power plants now operating close off or are they designed to totally close off ventilation when they operate?

A. Not to my knowledge. But there are cracks in all fire dampers and they don't totally close off ventilation.

Q. All right.

Do you know if they are intended or designed to totally close off ventilation?

A. They are designed to prevent the fire passing through the fire damper.

Q. Okay.

As to totally closing off ventilation, this would be a difference with the Harris plant?

A. If that is the case I would assume so.

Q. All right.

The need for smoke removal -- well let me ask you this:

Are either or both of you familiar with the testimony that was given concerning the in-duct smoke detectors for the Harris plant and how they were now planned to automatically shut off the air moving fans or other devices in the HVAC system for an area in which smoke

was detected in the ducts?

A. (Witness Eberly) I am.

Q. When the submittal comes before you for review that describes these changes in fire dampers and in ventilation control, you would have to review the adequacy of -- or the need for smoke removal under those conditions, would you not?

A. I'm not sure I understand your point. Could you repeat?

Q. Well I believe you earlier said that there was a general requirement in your analysis that the Applicant had to analyze the need for smoke removal and justify their position on it to the Staff.

A. That's correct.

Q. Okay.

Now when and if they submit these changes of fire dampers in the ventilation shut-off or ventilation power or air moving shut-off that we have been discussing, you will have to evaluate the adequacy of their analysis for the need for smoke removal under those conditions, will you not?

A. Yes, that's true.

Q. Okay.

Did you happen to hear or have you seen the statements as to smoke removal capability being reduced

that are in the marked-up Section 9.5.1 and 9.5A of October 10, 1984?

A. Yes, I have seen those statements.

Q. Okay.

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Q. Do some of those, to your knowledge, remove the analysis of smoke removal rate, the actual calculation of smoke removal rate, let me say?

A. I'm not sure I understand you.

Q. Well, in the former FSAR section 9.5.1 and 9.5A, were there not some calculations of smoke removal rate for various fire areas for the Harris plant?

A. Yes.

Q. Okay.

To your knowledge, have some of those been removed in the revisions made October 10? Some of these calculations?

A. Well, I guess the way I should answer is, I haven't reviewed it yet and formed an opinion. I've just had a superficial look at it so far. I'm not sure that those calculations have been removed.

Q. All right.

Well, at any rate the actual document when you get it and/or the record will reflect what is in it.

A. Whatever they submit, we'll have to go back and review it, make sure that it is adequate.

Q. All right.

Are there specific criteria for adequacy of smoke removal in your standard review plan?

A. No.

Q. But there is requirement to evaluate the adequacy of it?

A. That's correct.

Q. Okay.

Do you have any other guidance beyond the standard review plan that you use in this evaluation?

A. Well, what you'd have to use is sound fire protection engineering judgment, looking at other references, NFPA codes, there's some textbooks on the subject. Smoke removal is not an exact science, to say the least right now.

Q. Okay.

But you refer to texts or NFPA codes to inform your judgment on this matter?

A. Right. We'd expect that their fire protection engineering staff has looked at it and submitted something based on existing knowledge.

Q. Okay. I believe you stated that the submission including all three of these documents, the safe shutdown analysis, the FSAR 9.5.1 and FSAR 9.5A, were sufficient to permit you to review it.

Do these documents specify the actual location of fire detectors?

A. Not the specific locations. They provide the spacing criteria.

Q. Does the NRC Staff do any verification of the installed spacing of these things at the Harris plant?

A. We normally do a walkdown, when the plant is fairly

near to completion. And the purpose of our walkdown is to verify that what we wrote in our SER is correct, that we understood each other. And at that time I or another representative of NRR will go to the plant and will look at the system to see that the location on an audit basis are adequate.

Q. And that's going to happen in the future?

A. Yes, prior to licensing.

Q. Okay.

Now, the document that you referred to there, just for clarity, was the SER, the Safety Evaluation Report?

A. In which regard?

Q. I thought you said you did the walkdown to verify that the things that you had analyzed in your SER were correct?

A. That's correct.

Q. Okay.

Is the analysis in the document you're reviewing of the location of fire detection instruments as to how close they ought to be to various pieces of equipment or possible forces of fires?

A. If you're referring to the Applicant's FSAR?

Q. Yes, and SSA.

A. Right, okay.

In there they haven't given me any specific criteria. What they've done is committed to comply with the provisions

of the NFPA code.

Q. Which part of the code governs that?

A. 72E is the location and spacing of fire detectors.

Q. Have they made any commitments beyond that?

A. Not to my knowledge.

Q. All right.

Do you, in your review, make analysis of the time it would take for the fire brigade of the Harris plant to respond to fires in various locations?

A. No, we don't make a specific review of the Harris fire brigade. As stated in my written testimony, it's our policy that we don't consider the fire brigade is going to respond for at least 30 minutes. And therefore, we are providing fixed fire protection, such as sprinkler systems and fire barriers and so on, that they will, to contend with the outbreak of fire until that such time as the fire brigade will respond and supply whatever was needed as backup.

Q. All right.

In that analysis, is it assumed that no fire in 30 minutes would grow greater or hotter than the ASTM E-119 time-temperature curve?

A. Not necessarily. You can't look at just on temperature alone. You have to look at a temperature over a period of time. If you look at the E-119 time-temperature curve, it's a sustained growth of fire over a period. That's

typically the way you're going to find woodburning when there's enough oxygen present to support the burning. You could have plastics or hydrocarbons or some liquid fuel oils, for example, that might get a hotter temperature in a shorter time, but then they will die down from lack of oxygen or other factors. So if you -- just by referring to temperature alone, it's not an accurate representation of the configuration.

Q. Okay.

Well, I was trying to ask you about more than temperature. Let me ask you this --

A. Okay.

Q. Do you actually perform an analysis of the nature of the combustibles in a fire area as to the likely time temperature curves, as in the example you just gave for the Harris.

A. No,

Q. You don't for the Harris plant?

A. No, we don't perform an analysis.

Q. All right.

Then do you have the information available to you in the Applicant's submittal to perform such an analysis?

A. I imagine you would. But in answering it, I guess what I'd like to say is that in the fire test conducted, as Mrs. Serbanescu testified this morning, the E-119 curve was originally contrived by the National Bureau of Standards back,

I believe it was around 1918. And since then, there have been any number of tests performed by the Bureau of Standards and various other government and private industry groups to verify that this time-temperature curve is still valid for the types of configurations we see in modern buildings, because, you know, we have to admit that they don't build buildings the way they used to.

And in most cases, they can't get a time-temperature curve that equals the E-119 curve. In most cases it's much, much less. Unless they have specifically controlled conditions of oxygen and so on, and when we look at the materials that you typically find in a nuclear power plant and typically plastic cables, maybe some lubricating oil and so on, and without going into a specific room or specific configuration, I don't think it's possible that you're going to really exceed the time-temperature curve by any great margin.

Q. But you haven't analyzed it specifically for the Harris plant?

A. No, I haven't.

Q. All right.

As to the 30-minute assumption about how fast the fire brigade can get there, have you analyzed the accuracy of that assumption with respect to the Harris plant?

A. No, I haven't. I guess I could say that where we came up with 30 minutes is typically the Applicant's tell

us they can do it in 15 minutes and we usually just double it.

Q. Okay.

So that's sort of a Murphy's law allowance.

As to the operability of the automatic fire suppression equipment, does the NRC have standards for the reliability of this equipment?

A. We don't have specific reliability requirements.

Q. Well, is there any kind of QA requirement on it?

A. Yes, the plant fire protection program does have a QA responsibility.

Q. Do those requirements -- are those requirements part of something that you review?

A. No.

Q. Okay.

A. (Witness Ferguson) The technical specifications require the surveillance requirements and testing requirements for maintaining those systems are operable.

Q. All right.

How would you test a fuseable link?

A. (Witness Eberly) Normally you don't because you'd destroy it.

Q. Okay.

So you'd have to actually destroy it, make it operate, to see it if works?

A. Yes.

Q. Okay.

What about fuseable fire sprinkler, same thing?

A. Normally, you would only test a sprinkler every 50 years. And then it's only a sample.

Q. But you would, in effect, destroy the -- or --

A. That's correct. You have to melt it to test it.

Q. What about automatic temperature actuated valves, things like that?

A. Are you referring to things like sprinkler systems, preaction auxiliary systems?

Q. Right.

A. What you can do there is to send a simulated control signal to the control panel. It's an electronic signal you're sending in as a test signal and it will cause the valve to cycle.

Q. Okay.

And can you verify that the valve is open without letting some water out through it?

A. It depends on the type of system.

Q. All right.

Do you review the requirements for those sorts of tests for the Harris plant?

A. No, we review the requirement they have a test, the specific test requirement is generally looked at by our regional inspectors in the fire protection inspection module.

Q. Okay.

So this would be out of region 2?

A. For the Harris plant, yes.

Q. Right. Okay.

Have you -- this may be covered by one of your earlier answers, but since it's in the contention, I want to try to be specific about this.

Have you made any analysis about the time it would take the fire brigade to get into the containment under conditions, what the containment might be isolated?

A. No, I haven't.

Q. Do the documents that have been submitted for your review contain analysis of what will happen if a fire in one of these fire areas spreads?

A. No, there is no analysis to that extent.

Q. All right.

Were the diesel generator rooms -- diesel generator day tanks -- covered in Appendix 9.5A before this October 10th or 11th updating that's just happened?

A. Yes.

Q. Did you review the previous coverage of them in that appendix?

A. I did.

Q. Did it reference NFPA 37 at that time?

A. I don't believe so, I'd have to look.

Q. What criteria did you -- or what criteria or standard did you review the previous analysis of those day tanks against when you were reviewing it?

A. The diesel generator rooms including the day tanks were reviewed against our standard review plan. And I believe it's Exhibit 7 here.

Q. Okay.

Can you point me to a part of the standard review plan that would relate to those tanks?

A. Yes, one moment.

(Pause.)

If you would turn, Mr.Eddleman, to page 95148 you'll see paragraph J at the top of the page.

Q. Yes, I have that.

A. That's the pertinent section.

Q. Okay.

It says, "Diesel fuel oil tanks with a capacity greater than 1100 gallons should not be located inside buildings containing safety rated equipment." Is there any safety related equipment in the diesel generator buildings at Harris?

A. Yes, there is.

Let me add to my remark that that and the previous paragraph, paragraph I on the previous page.

Q. All right.

On paragraph I on page 9.5.1-47, toward the bottom, it makes the following statement, does it not?

"Day tanks with total capacity up to 1100 gallons are permitted in the diesel generator area under the following conditions: One, the day tank is located in a separate enclosure with a minimum fire resistance rating of three hours including doors or penetrations. These enclosures should be capable of containing the entire contents of the day tanks and should be protected by an automatic fire suppression system, or, Two, the day tank is located inside the diesel generator room in a diked enclosure that has sufficient capacity to hold 110 percent of the contents of the day tank or is drained to a safe location."

Is that correct?

A. That's correct.

Q. All right.

Do you know what the capacity of those day tanks at the Harris plant is?

A. I believe they're 3,000 gallons.

Q. That's more than 1100,isn't it?

A. That's right.

Q. Have the Applicants submitted a deviation in regard to this?

A. Yes, they submitted a deviation and we have approved it for increasing the day tank size from 1100 to 3,000 gallons.

Q. All right.

What is the reason for the 1100 gallon limit in this -- in these standards here that you're refer to?

A. I don't have a specific reason. I imagine it would be to coincide with the NFPA 37 or 30 standard at some point.

Q. Do you recall the statement in testimony this morning about NFPA standard applying to tank of 660 gallons or greater?

A. Right.

Q. 1100 is not quite double 660, but it's a good bit more, isn't it?

A. Right.

Q. As to part J on page 48 here, there is a parentheses at the end of this first paragraph there saying, "See NFPA 30 flammable and combustible liquid code for additional guidance." Correct?

A. That's correct.

Q. Okay.

What sort of criteria would you use, or did you use in evaluating the request for a deviation for the size of the day tanks at the Shearon Harris plant?

A. Let me first address that by speaking about the fire protection provided. They put the day tank in a three-hour enclosure, completely separated. The enclosure

is provided with a detection system to detect any fires in there. It's also provided with an automatic suppression system to suppress any fires. As I recall, the enclosure for the day tank has either got an elevated sill or other provisions to provide a dike that will contain more than the contents of the tank.

And I believe also the door to the day tank enclosure is water tight. So that if there is a spill it should be contained within the enclosure. I believe there is also a drain in the room, which is normally valved closed. And if there is a spill, they could go and manually open the valve and drain it to a sump somewhere in the diesel generator building.

And the second half, I'd have to refer you to general design criteria 3. And if you have it available, I'd just like to read the first part of it.

Q. Go ahead.

A. "General design criteria for nuclear power plants to 10 CFR part 50, licensing of production and utilization facilities requires that structures, systems, and components important to safety be designed and located to minimize consistent with other safety requirements the probability and effect of fires."

And here's where we get into this change from 1100 to 3,000 gallons, is that statement, "consistent with other

safety requirements." To my understanding, there is a requirement that the diesel generator has sufficient oil in the day tanks to operate for a period, I believe, of six hours, and for this type of diesel generator they need 3,000 gallons. And so in this case, the need for 3,000 gallons override our limit of 1100 gallons. In addition to that, we've looked at the protection provided and, in our opinion, we feel it's adequate to also contend with that greater capacity of diesel oil.

MR. EDDLEMAN:

Excuse me for a minute. I'm getting into a problem with this document production thing. I didn't expect this to come up in this way. But I have a document here that I think -- subject to check, I have to dig it out -- it says seven days supplies in those tanks.

And I'd like to try to get copies of that over the next break.

JUDGE KELLEY: Seven days? This came out on discovery or what?

MR. EDDLEMAN: It's answers to Staff's review questions, I think.

BY MR. EDDLEMAN:

Q. Is the requirement seven hours or seven days?

A. (Witness Eberly) I don't know. I just know they have a requirement of some time period.

Q. Well, let me ask you, along these lines, the

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enclosure within three-hour fire rated barriers, including doors being capable of containing the entire contents of the day tanks, and with an automatic fire suppression system that's one of the requirements of part I of this section that you just referred me to in your standard review plan anyway for an 1100 gallon tank, is it not?

A (Witness Eberly) That's correct.

End 15

16 fls.

Q. And the alternative is to have the diked enclosure or a drain to a safe location, that is likewise a requirement for an 1100 gallon tank, correct?

A. That's correct.

Q. Now it also says: "Diesel fuel oil tanks" -- This is Part J:

"Diesel fuel oil tanks with a capacity greater than 1100 gallons should not be located inside buildings containing safety related equipment."

Is there any requirement that those day tanks be located inside the diesel generator building, to your knowledge?

A. Not to my knowledge.

Q. All right. Now let me ask you this:

Do you read the use of the plural "tanks" there as meaning that all tanks inside a building should total no greater than 1100 gallons or only that -- well do you read it that way, let me ask you that first.

A. No, I don't.

Q. Okay.

How do you interpret the use of the plural word "tanks" there?

A. Each tank.

Q. So you are saying that each tank should be no

greater than 1100 gallons?

A. Right.

JUDGE KELLEY: It is like each fire.

(Laughter.)

What is a day tank, by the way? Is there a night tank, too?

(Laughter.)

WITNESS FERGUSON: A day tank is usually located in the area of the diesel generator to assure that you have a short-term supply in terms of, let's say, eight hours and that sort of thing. I believe there are storage tanks that are 175,000 gallons or so that give you the seven day supply that was referred to before.

JUDGE KELLEY: So it is a part of a day literally?

WITNESS FERGUSON: Yes.

BY MR. EDDLEMAN:

Q. Mr. Eberly, the top part of this Section I of the Standard Review Plan on page 9.5.1-47 concerning diesel generator areas has some other requirements beyond the specific day tanks, does it not?

A. (Witness Eberly) Yes, it does.

Q. Now would a day tank in a diesel generator area also be subject to those requirements?

A. Could you give me which specific requirement you have in mind?

Q Well for example, it says that:

"...automatic fire detection should be provided to alarm and enunciate in the control room and alarm locally."

A. Yes, I think that would apply to both areas.

Q. Okay.

"Hose stations and portable extinguishers should be readily available outside the area...," would that apply?

A. Yes.

Q. "Drainage for fire fighting water and means for local manual venting of smoke should be provided...," would that apply?

A. Yes.

Q. What is the means for local manual venting of smoke from the day tank enclosures at the Harris plant?

A. I believe they have a vent to the outside.

Q. Is that the vent off the tank, do you know?

A. No, it is a vent in the room.

Q. Okay.

Do you know whether the tank itself is required to be vented by any applicable fire code?

A. I believe NFPA 37 has some requirement for the design of the tank and I believe there is something in there about providing a vented tank.

Q Okay.

Does the design of a fuel storage tank commonly include a vent?

A. Generally, yes.

Q. It would be kind of hard to fill one up if it didn't have a vent, wouldn't it?

A. Generally.

Q. Okay.

MR. EDDLEMAN: I do want to come back to this area after a break when I can get this reproduced.

JUDGE KELLEY: I think the best thing for you is to reproduce it and distribute it and see what counsels' reaction is. They may object and they may not.

MR. EDDLEMAN: I am not asking for a break now, I am saying I want to return to this later.

JUDGE KELLEY: I understand that. It will be after the break though, right?

MR. EDDLEMAN: Yes.

JUDGE KELLEY: Fine.

BY MR. EDDLEMAN:

Q. Mr. Eberly, I believe your testimony continues on page six from where we were when we jumped off into the diesel day tank.

Let me ask you one other thing about that day tank. When you were reviewing it, did anything strike

you as funny about the diesel fuel being counted for fire protection purposes at somewhere around 95- or 100,000 Btu's per gallon?

A. (Witness Eberly) No, not really. In my review I just looked at the quantity of the diesel oil and formed my own opinion on the Btu's.

Q. Well as a former marine fire protection engineer, you would have occasion to know what the actual content of diesel fuel is, wouldn't you?

A. I would have a fair guess.

Q. And what was that guess?

A. In general ranges I would say, depending on the type of diesel fuel, it would have a specific gravity in the range of .8. And then therefore relating that you would have about 8.3 pounds of water in a gallon but since you have a specific gravity .8, you would probably come out to about 7 pounds in a gallon of diesel fuel.

And not knowing the exact grade, I would say in a range close to 20,000 Btu's per pound and therefore it would give you around 140,000 Btu's per gallon.

Q. I see.

Let me now continue with your page six and look at your answer six.

You say that you reviewed the Harris fire protection program contained in FSAR 9.5.1, in 9.5A and

safe shutdown analysis in case of fire dated June 20, 1983.

Were the FSAR sections you reviewed dated approximately the same time frame as June 20, '83 or earlier?

A. They were earlier.

Q. Okay.

Then you say that review is contained in Section 9.5.1 of the Staff's Safety Evaluation Report dated November 1983.

Have you been performing additional evaluation since that time?

A. Yes. Since that time, we have completed our review of the safe shutdown analysis.

Q. Okay. So you had not completed the review of the safe shutdown analysis at the time that the SER was issued?

A. That's correct.

Q. Okay.

Had you completed that review at the time this testimony was filed?

A. Yes.

Q. Okay.

Then you say in addition there will be supplements to the SER dealing with open items identified in that section.

Are the only open items for fire protection those that are listed later on in your testimony?

A. Yes, the last question in my testimony.

Q. In other words they are the ones listed in the last answer?

A. Correct.

Q. Do you have any idea when such supplements may be issued or available?

A. No, I don't. As you saw, the Applicants submitted to the NRC some information on fire doors in their October 10 submittal. So being that recent, it may be some time until we can get to it.

Q. It looks pretty thick to me so I imagine you've got a little work to do on that.

Let me ask you something else, Mr. Eberly: How many nuclear plants' fire protection do you currently have under review?

MRS. MOORE: Your Honor, might I request a clarification?

Is Mr. Eddleman asking Mr. Eberly as a personal matter?

MR. EDDLEMAN: Yes, I am asking him individually how many he is working on.

MRS. MOORE: Thank you.

JUDGE KELLEY: Okay.

WITNESS EBERLY: Give me a second here.

(Pause.)

Between 12 and 16.

BY MR. EDDLEMAN:

Q. And does this sort of work take up all your time on your job or do you have other responsibilities?

A. (Witness Eberly) Well my time is certainly taken up. It is parceled out per plant, you might say.

Q. But do you do anything else as part of your job responsibilities besides review these plants, the nuclear plants, that is what I am asking?

A. Yes, I am involved with our Appendix R inspection teams when we are doing some inspections of operating nuclear plants to verify that they meet Appendix R requirements and on occasion I have to accompany the regional inspection teams as an expert advisor.

Q. I see.

I can appreciate your needing to count. If somebody asked me how many lawyers for the power company I were dealing with, I would have to probably count for a while, too.

As to your insert seven on pages six and seven, I gather since this isn't addressed to either one of you, and in fact doesn't even have a question mark, that it is addressed to both of you; am I correct?

A. I would say that is a fair statement.

Q. It is a joint answer.

Did you gentlemen jointly prepare this testimony? I'm not sure if that was asked before.

A. (Witness Ferguson) Mr. Eberly prepared most of the testimony. I reviewed it specifically with -- with specific emphasis on those questions and responses which are concerned with Staff guidelines and so forth and made some revisions. But we both adopt it.

Q. Okay.

As to the language on the top of page seven, it says:

> "...and to minimize radioactive releases to the environment in the event of a fire...."

Does that mean that there could be, even within the kinds of fires that could occur with this program, properly established and in place as designed and everything working as designed, could still be radioactive releases to the environment in the event of a fire?

MRS. MOORE: Your Honor, objection. The testimony speaks for itself.

MR. EDDLEMAN: I think I am entitled to inquire what they mean by a phrase as general as minimizes radioactive releases to the environment.

JUDGE KELLEY: I don't think it is totally self-explanatory. We will allow the question.

WITNESS FERGUSON: In our reviews, there are two kinds of releases you can get: one, with enough damage to shut down systems that you expose the core, that's what we are most concerned with and that is what most of the requirements are dealing with.

And to the extent the plant has fire protection features which meet our guidelines and they operate as designed, we do not expect the core to even come close to being uncovered. We are saying that there should be one system free of fire damage to maintain parameters within the relatively normal conditions.

There is a possibility in storage areas of fires in low-level waste that is waiting to be shipped and that sort of thing. So if you in fact have a fire in such material, you would have very low levels of radiation released. Those have been analyzed on most of the operating plants. In every analysis we did it was so low that we quit requiring specific analysis of them.

MR. EDDLEMAN: Okay.

WITNESS FERGUSON: But that is where the "minimize" radioactivity -- the only two places we found where you have a potential for releasing radioactivity due to a fire in a nuclear plant.

BY MR. EDDLEMAN:

Q Are you saying that a fire damaging some safety

related systems could not cause some release of radioactivity from the nuclear steam system or the reactor by some damage less than causing the core to be uncovered?

A. (Witness Ferguson) I would assume if there is a -- given normal levels of radioactivity, let's say, in a boiling water reactor where you have steam which is -- which has some radioactive content, if there was a fire that caused a blowdown of that system, then there would be a radioactive release associated with that, that type of thing.

Q. Okay.

When you say "the fire protection program" in question seven and answer seven, gentlemen, are you talking about the NRC's fire protection program?

A. (Witness Eberly) No.

Q. You are talking about the requirements for the Applicants' program?

A. No, we are talking about the Applicants' program.

Q. Okay.

And this fire protection program is contained in those three documents you mentioned, Mr. Eberly, in answer six?

A. It is contained in there as well as including things like the plant technical specifications, the fire protection QA program, the procedures for fighting fires

in the plant, pre-fire plans and so on. It is the entire fire protection realm.

Q. All right.

So I take it then that your answer six should really be expanded a little bit because it says that the Harris fire protection program is contained in those three documents that we discussed earlier, rather than these additional things that you just mentioned, isn't that correct?

A. I imagine you could make the argument that the words are different.

Q. Well they are different things, right? The procedures and all aren't in the SSA or the 9.5.1 of the FSAR or 9.5A, are they?

A. Well if you look at those sections you will see commitments to providing pre-fire plans and providing QA things.

Q. And commitments for tech specs and so on?

A. Right. The actual documents aren't in there but there is a commitment to provide them.

Q. Okay.

Now other than looking at those commitments, did you review the tech specs proposed or the procedures or any of these other things that you were mentioning in that answer a moment ago?

A. No.

Q. All right.

Will you before you approve the fire protection plan for the Harris plant?

A. I review the proposed technical specifications. The procedures and other things are then done by our regional inspectors.

Q. Would they communicate their findings to you for your review?

A. Yes, if there are some unacceptable problems they will be calling me for some advice.

Q. That is distinct from an acceptable problem?

A. I imagine so.

Q. All right.

Now your question in answer nine, it is asked:

"Why is the fire protection program reviewed against these guidelines" -- being the Standard Review Plan, your Staff Exhibit 7, that's the question, right?

A. Right.

Q. Okay.

Now the answer begins by basically quoting General Design Criterion 3, correct?

A. Yes.

Q. And isn't it true that every reference to fires and explosions in those quotes is in the plural?

A. As far as I know, we have just quoted GDC-3. And whatever GDC-3 says is what I say.

Q. All right.

It says on page eight at the bottom of the first paragraph there:

"Suitable bases and justifications should be provided for alternative approaches to establish acceptable implementation of General Design Criterion 3."

Must they be established?

A. You have to justify anywhere where you are deviating from our guidelines.

Q. So you could effectively replace that word "should" with "must," couldn't you?

A. Yes.

Q. Okay.

Now then it says:

"SRP 9.5.1 presents guidelines acceptable to the NRC Staff for implementing this criterion" -- that is GDC-3, the criterion, right?

A. Right.

Q. Okay.

Now I believe Mr. Ferguson already answered that Appendix R was included, or its technical requirements were included in SRP 9.5.1. Is that right?

WITNESS FERGUSON: Yes.

JUDGE KELLEY: Wasn't there a specific citation within Appendix R, a long laundry list found about halfway through?

When you say "technical requirements" I am thinking what are they? Can I find them in a particular section?

WITNESS FERGUSON: Specifically Section III and there is a paraphrasing of those in Section II. It is general requirements.

JUDGE KELLEY: Excuse me a moment.

(Pause.)

I thought you said III.G in this context. Am I wrong?

WITNESS FERGUSON: Well, specifically III.G, J and O, but all of the Section III requirements are in Appendix A or are in the present CP.

JUDGE KELLEY: Okay. We'll go over to Appendix A.

WITNESS FERGUSON: Yes.

JUDGE KELLEY: Excuse me.

BY MR. EDDLEMAN:

Q In regard to Appendix R's technical requirements,

gentlemen, do you have a copy of Appendix R available to you?

A (Witness Eberly) Yes, we do.

Q Now I've got the NRC Rules version so I don't know exactly how to specify the part in your version.

A Specify by paragraph number.

Q I think it is Paragraph 3-M, Fire Barrier Cable Penetration Seal Qualification.

A Yes, we have it.

Q All right.

Now it first says that:

"The penetration seal design shall be qualified by tests that are comparable to tests used to rate fire barriers."

Correct?

A Yes.

Q Then it proceeds to list some acceptance criteria that the test shall include. Correct?

A Yes.

Q Now the second of those criteria is that:

"The temperature levels recorded for the unexposed side...."

and I gather that's the unexposed side of the fire barrier --

"....are analyzed and demonstrate the maximum temperature is sufficiently below the cable insulation ignition temperature."

Does the Staff have any interpretation of what temperature difference is sufficiently below the ignition temperature?

A As stated in our guidelines in 9.5.1, we are currently utilizing an acceptance criterion that the temperature levels recorded on the unexposed side are analyzed and demonstrate that the maximum temperature does not exceed 325 degrees Fahrenheit.

Q Okay.

And that's regardless of what the particular ignition temperature on the cable insulation is? You require it to be below 325 in the test on the other side of the fire barrier?

A That's right.

Q All right.

The cables themselves, do they carry through this seal?

A Yes. It is where they penetrate the wall.

Q Okay.

If the cable insulation itself is burning on one side, could the fire get through by just burning along the cable?

A No, that's the purpose of the penetration seal. It is stuffed in around the cable. It fills the hole.

Q Okay.

Now in the test of these is the cable on the fire side actually set on fire?

A Yes, it's in a furnace.

Q It is burning?

A Yes.

Q I'm trying to check here.

Part N there on Fire Doors, just below Part M, I believe. Have you reviewed the closing mechanisms or measures specified for the fire doors at the Harris plant?

A Not yet.

Q All right.

Will you do that in your review of the doors?

A Yes, when we get a final submittal from the Applicants telling us "Here are the fire doors we will use," then we will have to go through the entire qualifications of the doors.

Q Okay.

And would that include just the doors that are designated fire doors or would it also include the special doors which are part of fire area boundaries or fire barriers?

A That's correct, it would include all doors and fire barriers.

Q So the answer would be Yes?

A Yes.

Q Okay.

You say the Fire Hazards Analysis is performed to show conformance with GDC-3. Correct?

A Yes.

Q Okay.

Now this says the analysis submitted by-- I take it the analysis submitted by Applicants. I'm on page 8 of your testimony.

The analysis submitted by Applicants identifies and justifies any deviations from the guidelines.

A Yes.

Q Okay.

Does your review include checking to see whether parts that are not identified as deviations in fact deviate from these guidelines?

A Yes.

Q ANd is that on a sampling basis, or on an item-by-item basis?

A Well, I have to go through and verify each item, and if it hasn't been identified as a deviation and in the process of looking at it it may be one, it is something you pick up in your review.

Q Have you completed your review of the entire analysis?

A Except for fire doors.

Q Now it says "....deletion of a protective

feature...." Wait a second.

It says "....justification for deviations which shows an equivalent level of protection will be achieved are usually acceptable to the Staff."

What kinds of justifications showing an equivalent level of protection would be achieved would be unacceptable to the Staff?

A I'm sorry, I'm not sure I follow you, Mr. Eddleman.

Q Well, I'm reading, I believe it is the second from the last sentence on page 8, and it states:

"....justification for deviations from the guidelines...."

and I'm taking it the "which" refers to justification; it may refer to guidelines but--

"....which shows an equivalent level of protection will be achieved are usually acceptable to the Staff."

Now what I'm focusing on is that word "usually."

What kinds of justifications showing an equivalent level of protection will be achieved would be unacceptable to the Staff? Is that a case-by-case thing, or are there generic kinds of them?

A Yes. What we are trying to do here is we're not giving them a hundred percent thing, saying "We'll accept any deviation provided you provide an analysis."

We are saying we reserve the right to analyze it and verify it to our own judgment that an acceptable level of protection is provided.

Q Okay.

But it says "....justifications....which show an equivalent level of protection...."

Do you mean which purport to show an equivalent level of protection, that isn't just submitted and say they show an equivalent level?

A No, what we mean is which show it and which we agree with.

Q Okay.

And even those aren't all acceptable. Is that what this says?

A No, if we agree with it, they are acceptable.

Q But it says "usually acceptable." That is still what I haven't figured out.

A Well, as I said, we just didn't want to say that all cases, so we said "usually."

Q Okay.

And the next sentence:

"Deletion of a protective feature without compensating alternative protection measures...."

it says --

"....will not be accepted by the Staff if it is not clearly demonstrated the protective measure is not needed because of the design and arrangement of the particular plant."

Are you and Mr. Ferguson the people who would review that lack of need in design and arrangement and so on?

A Yes.

Q And would your determinations of what designs and arrangements underlie that need be provided to the inspectors of Region II?

A Well, it would be contained in our SER.

Q Now would they use the SER? Would operational inspectors at the plant, when the plant become operational, be able to refer to the SER when they conduct their inspections?

A Yes, they should.

Q They would have a copy?

A Yes, they will have a copy.

Q Now the Fire Hazards Analysis in question and answer 10, are there additional things like tech specs and procedures and so on that are part of being able to show or not show that the plant would maintain the ability to perform safe shutdown and minimize radioactive releases in the event of fire that are not included in the list in answer 10?

MRS. MOORE: Your Honor, I object on the grounds that I'm not sure what the question is, but I believe it has

been asked and answered, if I understand his question.

JUDGE KELLEY: Will you restate it, please?

MR. EDDLEMAN: Well, Mrs. Moore may be correct. Let me ask you this:

BY MR. EDDLEMAN:

Q I will ask a slightly different question.

The things that you have to have to actually maintain the ability to perform safe shutdown functions and minimize a radioactive release into the environment in the event of a fire have already been stated by your gentlemen previously, haven't they, in our discussion this afternoon?

A (Witness Eberly) Yes.

Q Okay.

JUDGE KELLEY: It is about time for a short break. Is this a good enough place?

MR. EDDLEMAN: Okay.

JUDGE KELLEY: Mr.Eddleman, when we come back, would you think over the break and make an assessment about where you are, and give us an estimate of the time you are going to need to complete this panel when we get back?

MR. EDDLEMAN: I will try, Judge. I am going to have to dig for my document first.

JUDGE KELLEY: Okay. See what you can do.

We will take a recess now.

(Recess.)

JUDGE KELLEY: Back on the record.

A couple of things before we get back to questions.

Mr. Eddleman, can you give us an estimate of how long you think you need for crossing this panel?

MR. EDDLEMAN: I think I am more than half done, and if we go to six, I may very well be able to finish today. That depends somewhat on how long the answers are to these questions, but I think I've gotten a little bit past half of the number of questions.

JUDGE KELLEY: If you can finish by six that would be good. We intend to go until around that time.

MR. EDDLEMAN: All right.

JUDGE KELLEY: Mr. Baxter, did you want to make a comment about your distribution?

MR. BAXTER: Yes. I would just like the record to reflect that today I have served on the Board and the parties in attendance, including the NRC Staff, Mr. Eddleman, and the Conservation Council of North Carolina, Applicants' motion to amend the schedule for emergency planning issues dated today. It is also being served by mail today.

The motion concludes that Applicants are in the process of consulting with the parties on this proposed schedule and will report to the Board on the results of that consultation.

I would hope to get a position out of the parties

who are here, and maybe contact the others by phone so that we can take this up first thing Tuesday morning.

JUDGE KELLEY: Okay.

In any event, some time next week we could discuss it and hopefully resolve it, and that would be good.

We just glanced at it but from what you just said, we know what it's about.

Okay, Mr. Eddleman, we'll go back to you then and resume cross.

MR. EDDLEMAN: Okay.

Let me just say for the record that although these discussions are on-going, my initial reaction to this is oh, no, it is going to mess my teaching schedule up again. We'll see what comes out.

JUDGE KELLEY: Okay. Talk it over among yourselves and we'll see how it does come out.

MR. EDDLEMAN: Okay.

THis question and answer to a Staff question to the Applicants with its identifying serial number and date is being handed out.

JUDGE KELLEY: It is short. Maybe we can all just take a look at it.

(Pause.)

JUDGE KELLEY: Is it your desire to ask a cross-examination question based on this paper from discovery?

Is that right?

MR. EDDLEMAN: Yes-- This is not a discovery paper. This is one of the responses to NRC questions that were served on the parties under the Board's order.

JUDGE KELLEY: I see. It's a little different.

Any objection from-- It is distributed now not in perhaps total compliance with the transcript cite you gave us earlier today, Mrs. Moore, but any objection to Mr. Eddleman asking a question about this?

MRS. MOORE: No, your Honor, I have no objection.

JUDGE KELLEY: Okay.

Mr. O'Neill?

MR. O'NEILL: We have no objection as long as it is clear that this refers to the underground storage tank. That would not be clear from the piece of paper on its own.

JUDGE KELLEY: I think whatever is ambiguous in it could be clarified in the course of the question.

Why don't you go ahead?

MR. EDDLEMAN: I will try to do that, and I think there was an exception later on in that transcript having to do with a kind of surprising answer that you didn't think you would have to impeach or question on.

BY MR. EDDLEMAN:

Q Gentlemen, have you had a chance to look at this document now, and read it over?

A (Witness Eberly) Yes.

Q This concerns the total onsite fuel supply for the diesel generators as I understand it, the outside tank as well as the day tank. Is that your understanding?

A Yes.

Q Now are you gentlemen in the part of the NRC Staff that generated this question, to your knowledge?

A No.

A (Witness Ferguson) I don't think so, no.

Q All right.

The response shown from CP&L there is that the outside fuel supply is sufficient to operate the diesel generator for more than seven days. Correct?

A (Witness Eberly) That's right.

Q Now do either of you gentlemen recall the requirement, if there is a requirement, for the amount of -- I mean the amount of time that the diesel generators can operate on the day tanks alone for Harris?

A Excuse me. Did you say the requirement?

Q Yes. Is there such a requirement?

A As I hopefully premised my response when we discussed this previously, it was my understanding that the day tank had to be there to provide a certain number of hours, and that the diesel fuel storage tank would be underground or a buried storage tank with some additional quantity. That

was my understanding.

Q Have you, in the course of your fire protection review, had a look at the proposed technical specifications in regard to the fuel supply for the diesel generators?

A No, that's outside my area of review.

Q Okay.

MR. EDDLEMAN: I think that's about as far as I can go with that.

JUDGE KELLEY: Okay.

BY MR. EDDLEMAN:

Q Gentlemen, if you will refer to page 10 of your testimony, now this refers to ASTM Method E-119.

Now is that a method that includes the specified time-temperature curve that we've been talking about earlier?

A (Witness Eberly) Yes.

Q Is this method referenced by the NRC's regulations for nuclear power plant fire protection?

A Our guidelines.

Q The SRP guidelines?

A Yes.

Q Where is that reference? Can you cite it?

A If I could refer you to.... Give me a second, please.

Q Sure.

(Pause.)

A If you're looking for a direct quote, on page 9.5.1-29 --

Q I have it.

A -- in Paragraph 3, the second part there, it refers to ASTM E-119.

Another area is under the definitions section, which is not a direct reference, and that would be on page 9.5.1-13.

That would be under the definition-- Have you got it?

Q Yes, I've got it.

A That would be under the definition of "Fire resistance rating." Let me just read that:

"Fire resistance rating is the time that materials or assemblies have withstood a fire exposure as established in accordance with the test procedures of standard methods of fire tests of building constructions and materials, NFPA Standard 251."

If you went to that standard it refers to the E-119 test in that standard and the test method.

Q Okay.

Now let's see.... Excuse me. Go ahead.

A I'm finished.

Q Oh, you're done?

A Yes.

Q Now it says in the middle paragraph of your page 10, gentlemen:

"Test assemblies which are typically 180 square feet or larger are mounted in a test furnace."

Do you know how that mounting is done?

A If you're talking about a wall assembly such as a fire wall-- For example, if you had a wall consisting of concrete block, there's an opening in the test furnace wall and the blocks are just laid in there in a representative configuration.

Q So you just-- In other words you have a side which is actually the furnace itself?

A That's right.

Q And then the other side is ambient normal temperature, air?

A Yes. The test furnace is like a box, and on one side of the box you have hole that you mount your test specimen, and on the unexposed side is the interior of the laboratory building and the ambient temperatures.

Q All right.

Now in that time versus temperature curve that the furnace reproduces, does this procedure specify what fuel would be used to produce the temperatures required?

A I believe it specifies propane gas.

Q I see.

And are there any specifications on the total heat input at the temperatures involved into the furnace?

A I believe, because of the number of gas jets that are involved, the temperatures have to be regulated by a number of thermocouples in the furnace, and that will give you the total heat input regulation.

Q Okay.

Now I don't quite understand how that gives me the total heat input.

A (Witness Ferguson) What is really specified is the time-temperature curve. You have to maintain the time-temperature curve regardless of how much heat it takes to do it. We are not specifying a fixed heat input to the furnace. The bigger the furnace, the more heat you would require to maintain the same time-temperature curve.

Q Are the thermocouples mounted near the test assembly or wall?

A (Witness Eberly) Are you speaking of the furnace thermocouples?

Q Yes.

A Would you like me to look it up? I have the standards here.

Q Please.

(Pause.)

A I have here ASTM Standard E-119 and I'm reading from Section 4, entitled "Furnace Temperatures," Paragraph 4.1. Quote:

"The temperature fixed by the curve shall be deemed to be the average temperature observed from the readings of not less than nine thermocouples for floor, roof, wall, or partition, and not less than eight thermocouples for a structural column symmatrically disposed and distributed to show the temperature near all parts of the sample...."

And then it goes on for about half a page with some additional technical details.

Q In other words they're required rather strictly to be mounted near the sample,--

A Yes.

Q -- and distributed over the surface.

A Right.

Q Okay.

Now let me ask you this:

If you were testing a fire barrier or a fire stop that would be put on a vertical cable room where it penetrated through a fire wall or floor, would that be mounted into the top of the furnace and have the fire come up at it the way

it would be in reality if there were a fire under it?

A Yes. If we were testing a vertical assembly like that, we would probably put it in the type of furnace used for testing of a floor whereas the fire is underneath, going up.

End 18

Q. Let me try to get back to this question of heat input. I'll tell you what I'm trying to get at. I gather that as people dealing with fire protection, you would have some knowledge of the role of heat as well as temperature in igniting materials or damaging materials?

A. That's correct.

Q. For example, I understand that people can successfully breathe dry air at rather high temperature, say, 400 degrees fahrenheit,but on the other hand if my body were raised to 400 degrees fahrenheit, I'd be in severe trouble, I should think.

Let me ask you if a similar thing would apply to structure being exposed to high temperature, in other words, would it be possible to expose the fire barrier to a high temperature with a relatively low heat input?

A. I guess what you're getting at is the old 2 x 4 and the match syndrome. That you can hold a match on a 2 x 4 and the temperature of the match is probably 1500 degrees, but you're really not doing much damage to a 2 x 4.

Q. Well yes, that would be part of the thing.

A. But with E-119 test, by having the thermocouples in there, you have to heat the entire furnace up to that temperature and maintain it at that temperature for that time period. And in order to do so you have to be putting in extensive amounts of heat.

Q. Well, is the furnace heat input measured during these tests?

A. I would have to look at the standard to verify that.

Q. Okay.

When you look at test results, is there a thing on the results form that tells you how much heat input there was?

A. Typically, no. It's furnace temperature.

Q. Okay.

Are there any standards to the degree to which the furnace itself is insulated other than at the opening or space where the tested assembly is inserted in the side or top of the furnace?

A. I don't know of a specific requirement in that regard.

Q. All right.

Did you gentlemen hear the Applicant's witnesses say that they just recently found out what the cable insulation heat contents would be for the Harris plant?

A. Yes.

Q. Has that information come before you prior to the October 10 or 11 submittals?

A. We had a telephone conference with them about a week ago where they told me that there were going to be some changes, but I was not aware of exactly what the changes were

going to be other than that the heat of combustion cables was different and it would be -- FSAR change would be submitted to correct that.

Q. All right.

So, until you complete your review of that, you couldn't say one way or another whether the Applicant's submittal about that heat content and its meeting of requirements for fire protection is correct?

A. If I could rephrase your question, are you asking that are the Applicants providing accurate values of the heat content of the cables?

Q. Well, I wasn't asking that, no. Let me try again.

A lot of the analysis of fires or potential fires involves cable insulation or the combustible in the Harris plant, doesn't it?

A. Right.

Q. Now, you've reviewed the previously submitted, that is before October 10th of this year, information concerning the heat content of that cable insulation in various fire areas in the Harris plant as submitted at the times we discussed earlier, correct?

A. Right.

Q. Okay.

Now, the new heat content of statements and calculations based on those, you haven't reviewed yet?

Q. What I'm saying is, until you complete that review, you can't validate it, can you?

A. I'm not -- I guess I'm still not getting the question. As far as my validating their claim of what the exact BTU content is, I can't do that.

Q. Well, would the NRC check references or something? I mean, in other words, if I come and tell you I've got a cable insulation here of a type such-and-such and its heat content is X, would you check against a reference or test reports on that insulation to see if that heat content was accurately reported by me?

A. Well, we would certainly make sure that it was within an acceptable range or something where you'd normally expect.

Q. Uh-huh.

But would you specifically verify the heat contents?

A. No.

Q. Okay.

Now, in the furnace test, does the 240,000 BTU per square foot standard -- if we can call it that -- for a three-hour fire barrier have anything to do with the furnace test of method E-119?

A. Indirectly. If we go back to the building burnout tests that Mrs.Serbanescu referred to this morning, the

combustible loading in those buildings was measured on, what it was, I believe was wood cribs or lumber piled in certain piles, and what they did was calculated how many pounds per square foot of wood was used. And for the type of wood they were using, the heat content was 80,000 BTU's per pound.

And this has been carried along through the years and related to the time-temperature that, if you have, I believe it was 10 pounds per square foot is a one-hour fire, 80,000 BTU's per square foot.

And so it's used as a measure. Sort of a quantitative way of assessing things.

Q. Now, let me ask you this. A three-hour fire, an actual three-hour fire, would have to keep burning for three hours, right?

A. Right.

Q. Okay.

Now, so in this original burning up of a building or simulated building with wood in it, as you describe, it would have had to have taken three hours to burn up the 30 pounds per square foot of this 80,000 BTU per pound wood, correct?

A. Yes.

Q. Is it possible for some things in a nuclear plant to burn -- have heat generation rates faster than this 80,000 BTU per hour?

A. When you say faster, could you expand on that a little bit?

Q. Well, okay.

Well, let's say --

A. (Witness Ferguson) Excuse me. I want to clarify. You said a heat generation rate of 80,000 BTU's per hour. Did you mean to say 80,000 BTU's per square foot, which is the number you used --

Q. Yes, I just -- I realized when you started to ask that that that's correct. 80,000 per square foot per hour.

A. I don't recall that is not a heat generation rate --

Q. Well, it's a heat generation rate per square foot of the fire area, right?

A. Only if you put a time on it. If you say you burn it up in one hour, then I --

Q. Okay.

I see what you're saying. I agree with you. Let me try to phrase the question.

A. I'm not sure that we understand your question.

Q. I understand your point. Let me try to rephrase the question.

A. (Witness Eberly) Combustible loading is what you mean.

Q. Now the combustible loading is in BTU's per square foot, correct?

A. Right.

Q. Now the heat generation would be in BTU's -- the heat generation, which would be in BTU's per hour, correct?

A. (Witness Ferguson) Yes.

Q. Now, what I'm asking for is sort of a hybrid of these and I don't even know if it has a standard name. But, in other words, are there combustibles in the Harris nuclear plant or parts of it? For example, diesel fuel, which could generate more heat per square foot per hour in a fire area than the 80,000 BTU per square foot per hour of this E-119 standard fire?

A. Yes, okay. I understand your question.

The 80,000 BTU's per square foot which, over the years the fire protection engineers have come along and said okay, this is a one-hour fire. This is based on the burning of wood. And your question is, well, now, if I use diesel oil, is that going to give me a one-hour fire or a shorter or longer fire, or what?

It depends very much on the specific situation. If there is a tank of diesel fuel, have you spilled it on the ground, is it a mill thick, is it an inch deep. It depends on the configuration, the amount of air available.

And most of the research studies done over the past 50 years have found that in the case of diesel oil, for example, the temperature will go up and exceed the temperature,

the time temperature curve in the first few minutes, but then it will drop down way below it for the remainder of the exposure period.

And the way you average it all out is by calculating the area under the curve.

Q. And that would be a total heat input?

A. Time versus temperature, yes.

Q. All right. Okay.

Let me ask you this. Did you review the history of actual industrial or marine diesel fires, diesel fuel fires, in your evaluation of the Harris plant diesel day tanks, and diesel building fire protection?

A. Well, I relied on my, you know, past knowledge and experience.

Q. Have you ever dealt with such a fire?

A. Oh, yes.

Q. Okay.

Was that as a marine engineer, was that with the Coast Guard?

A. Well, then as well as, you know, in my education. Learning the principles of how flammable liquids burn.

Q. In other words,in your education, you'd go through case studies or histories of such fires?

A. That's correct.

Q. And then you still recall that pretty well?

A. As best as can be established after a number of years.

Q. Well, what I mean is, did you go back to your old textbooks or your old notes when you were going through the Harris plant diesels and check about diesel fires there?

A. Well, I didn't have the need to, when I did the Harris review.

Q. Well, what knowledge of diesel fires did you use in the Harris review?

A. Well, could you relate it to a specific question or part of that review

A. Well, for example, the approval of the exception or deviation for having more fuel in those day tanks than your guidelines provide, did you look at the additional fire-proof potential of having more fuel in there?

A. Yes.

I looked at the fire protection provided in the arrangement of the day tank room and I guess the thing in mind is that once you are going to put a thousand gallons of diesel fuel in a room, you are not increasing the hazard that much more by making it 3,000 gallons, because you have to consider that you've got an enclosed tank and I think at the time of the review, it was a seismically qualified tank or capable of withstanding the SSE. So I didn't consider that it was going to be a catastrophic failure. The tank isn't going to break in half and dump all the fuel to the floor. If

there's going to be any kind of a leak, it's just going to be a small leak. And then you have to consider how much oil do you need to get into the lower flammable range of diesel fuel. And it's way below 1,000 gallons. So by increasing from 1,000 to 3,000 gallons, I didn't see that much greater of a hazard.

Q. Could a fire, a diesel fire in that area or other fires cause the tank to rupture?

A. I imagine if there was no intervention by the sprinkler system or the plant fire brigade. And if the venting from the tank was -- the capacity was overcome by the temperature generated by the fire, it could cause a rupture. But there are three things that would have to fail first.

End 19

20 fls.

#20 WRBwbl

Q. Do you know what the flame temperature of a diesel fire is? You were talking about it going up higher than the time-temperature curve early on.

A. I would say it is, depending on where you measured it, it's in the vicinity of 2000 degrees.

Q. In your Answer 17, toward the bottom of page 11 of your prefiled testimony, gentlemen, I just want to clarify:

Are all specific fire barrier locations and qualifications contained in those two documents that you cite there for the Harris plant?

A. I would have to qualify that by saying I believe most of them are. There may be one or two that, you know, elude me at the present time.

Q. All right.

Would those others also have been available for your review if they are not in those documents?

A. I would think so.

Q. But you don't know for sure?

A. I can't say that I've seen 100 percent of everything, no.

Q. Okay.

In Answer 19 on page 12-- Strike that.

Could I refer you, instead, to the Standard Review Plan, page 9.5.1-25?

A. Yes. Go ahead.

WRBwb2

Q. This is a listing of requirements for fire brigade training in practice and drills, is it not?

A. Yes.

Q. Item 2, near the top of the page, like the second paragraph, right under the note there, states,

"The instructions should be provided by qualified individuals who are knowledgeable, experienced and suitable trained in fighting the types of fire that could occur in the plant and in using the types of equipment available in the nuclear power plant."

Do you understand "types of equipment" there to include types of fire fighting equipment?

A. That would be my reading of it.

Q. I asked "include," not limited to.

Now, which of you, if either, reviews the qualification of the individuals who are to conduct training of the fire brigade at Shearon Harris?

A. Neither.

Q. All right. I guess that takes care of that.

Answer 19, back again on page 12, please. The other alternatives to fire barriers, I think Mr. Eberly already talked about providing an alternative shutdown capability for the control room.

In the second part of that, "A deviation could

WRBwb3

be requested for a combination of other features if they provide an equivalent level of protection."

Is there guidance in the Standard Review Plan for figuring out what an equivalent level of protection would be?

A. No.

Q. All right.

In your Answer 20 below there, you talk about consequences of fire exposure being evaluated in terms of damage to equipment installed in the fire area.

Where, in the fire hazards analysis, did the applicants evaluate damage to equipment installed in the fire areas? Is that part of the 9.5A analysis, or is it in some other part of it?

A. I'd have to say that is best addressed in the safe shutdown analysis. For example, they pick an area and they have to analyze whether, if there is redundant equipment in there, could it be damaged from a fire, and then do they need to provide a one-hour or three-hour barrier.

Q. So, really, this means damage to redundant equipment, does it not?

A. Not necessarily.

Q. Okay.

Is evaluation of damage to all equipment in an

WRBwb4

area always carried out in this analysis?

A. Well, it depends on what the equipment is.

Q. Well, safety related equipment, let's say.

A. Right.

I guess what I was trying to get at was, you could have a room witn charcoal filters in it, just one train, not redundant. And, you know, the applicants' evaluation has gone through and looked at the charcoal filters and said, Yes, they could be damage to the charcoal filters, so they provided a suppression system or something for this, for the charcoal filters, even though it has a redundant counterpart elsewhere.

Q. Are the charcoal filters in separate fire areas, separate trains?

A. I don't know.

A. (Witness Ferguson) Another meaning of this remark is that you have, for example, a fire area which has only one division in it. The analysis might be that if we turn up this entire area we lose one division, and we still have divisions other places. That would be the extent of the analysis.

Q. Okay.

So that would be, rather than a direct evaluation of the consequences of fire exposure, you'd just say Well, in the worst case it all burned up, you'd just lose it all?

WRBwb5

A. That's the first step in the analysis, to decide whether you're dealing with a sensitive area or you're not. It's when you get down to, if you do all that then you have a problem that you go into a more detailed analysis.

Q. Let me ask you about piping penetrations through fire walls or fire barriers, or floors or ceilings, for that matter, at the Harris plant.

Are there standards in the Standard Review Plan for evaluating -- how can I say it? --how tight or fire resistant penetrations for a bunch of pipes that go through a wall, or a pipe that goes through a wall or ceiling, that kind of thing, are?

A. (Witness Eberly) Yes; the same standards would apply to any penetrations of a fire barrier.

Q. And it would have to have some kind of a fire seal in it?

A. Right; you have to fill the hole around it.

A. (Witness Ferguson) Or evaluate in some way. In some cases there are pipe penetrations which require clearance for movement, for expansion, seismic and that sort of thing. And if there are openings, if the openings are not sealed, as Mr. Eberly said, then the effect of those openings would have to be analyzed and shown to be of no problem.

Q. Okay.

In that area also would you depend on the

WRBwb6

applicant's QA problem for verifying that those appropriate seals of redundant systems were installed?

A. (Witness Eberly) Right; the QA program as well as the plant tech specs.

Q. Okay.

Now, the plant tech specs will be something that the NRC staff could enforce were the plant in operation; right?

A. Right.

Q. Okay.

The consequences of fire exposure, it says, also may be evaluated in terms of the adequacy of the fire area boundaries, as I read this Answer 20.

Am I interpreting that right, gentlemen?

A. Yes, I believe so.

Q. Okay.

What sort of evaluation of the adequacy of fire area boundaries have you found in your review?

A. Well, I don't have anything specific in mind for the Harris plant; but what we're getting at here is that fire area boundaries are normally a three-hour barrier. The applicants have the option of coming to us and saying, We have a fire area here and there is nothing in it but water tanks, and in the adjacent room there is nothing but other water tanks, so we would like to propose using only a one-hour

WRBwb7

barrier instead of a three-hour barrier. And then they do an evaluation based on the hazard and the combustible loading and so, showing that the one-hour barrier is acceptable in lieu of a three-hour barrier.

Q. Is the basic requirement a three-hour barrier, and everything else is exceptions to that?

A. Well, for fire area boundaries the basic requirement is for a three-hour barrier. We don't enforce that for exterior walls unless there is some outside hazard such as transformers or oil tanks immediately adjacent to the building.

Also, you could have a fire area boundary that ends at a stair tower. And I believe, as Mrs. Serbanescu pointed out yesterday, the stair towers are two-hour barriers with one-and-a-half-hour doors, which is standard industrial protection. And if that is part of the barrier, we don't require that the stair tower be upgraded to a three-hour boundary.

Q. Okay.

Now, are the two-hour barrier and the one-and-a-half-hour doors sequential in access to that stair tower fire area? Do you have to go through both of them to get into the stair well?

A. No; the stair well itself, the concrete part of the stair well is two-hour. The door is one-and-a-half-hour.

WRBwb8

But it's closed from bottom to top. So if you do have a fire in one area it has to burn its way into the stair tower, go up the stair tower, and then burn its way out. So essentially you're burning through two one-and-a-half-hour barriers.

Q. Okay. I see what you're getting at.

It also says at the bottom of that page,

"If redundant equipment required for safe shutdown located in the fire area could sustain damage, then appropriate fire protection measures are provided within the fire ares."

Are there criteria for appropriate -- for those measures?

A. Yes; that would be either Section 3G of Appendix R or SectionC5-b of the Standard Review Plan, 9.5.1.

End-20

Q. And those cover that?

A. Yes.

Q. Now let me ask with respect to answer 21, item little "a" on page 13, is this "a" method used at Shearon Harris for any cable, safety related cables?

A. In some cases.

Q. Okay.

Have you evaluated the protection of the structural steel forming part of or supporting the fire barriers for that cable?

A. As far as I can recollect they have protected it -- I don't recall that they have singled it out as a deviation.

Q. Okay.

And have you reviewed it yourself?

A. No, I haven't looked at the specific drawings or anything like that.

Q. Okay.

Now were either of the other methods also used at Shearon Harris for any such cable?

A. Yes.

Q. Both of them?

A. Yes.

Q. Okay.

In the beginning of answer 21 it says your

guidelines specify that one train of cables and equipment necessary to achieve and maintain safe shutdown should be maintained for your fire damage.

Again, does that "should" really mean "must" in terms of the requirements of the regulations -- or guidelines, pardon me?

A. As far as my review that either you met these specifications here in paragraphs little "a, b and c" or requested a deviation.

Q. Okay.

And then the deviation would have to provide alternative shutdown capability as stated down at the bottom of the page?

A. It can either be alternative shutdown or it could be another means of separation, provides an equivalent level for the specific configuration in which it is installed.

Q. I don't believe that alternative was covered in your testimony, was it?

A. Well it is basically the exception process.

Q. Okay.

I can't find a discussion of exemptions in that part either. Am I wrong?

A. If you go to the end of page 14, the last paragraph.

Q. Yes?

It says:

"The alternative assures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control station is free from fire damage."

A. On page 14, the part I was referring to is:

"...plant specific features may require protection different than the measures specified. In such a case the Licensee must demonstrate by means of a detailed fire hazards analysis that existing protection or existing protection in conjunction with proposed modifications will provide a level of safety equivalent to the guidelines in Section C5(b)."

This is primarily speaking of the exemption or deviation process.

Q. All right.

Now how many exemptions or deviations with respect to safety related cable or instrumentation or power cable are there for the Harris plant?

A. There are a number of them. And I think in my review I grouped a number of them together because they were common types of deviations.

And I think in my SER I said there are nine. I think that is in my written testimony here as well.

Yes, if I can refer you to answer 22.

Q. 22?

A. Yes, on page 15.

Q. Okay.

Those nine are all related to cable?

A. No, in some cases it is equipment as well.

Q. Okay.

What documents other than the SER contain the analysis or review that you made of those nine deviations?

A. The information consis s primarily of the six volumes of the safe shutdown analysis. And in Applicants' submittal dated February 24, 1984 and another submittal dated June 12, 1984.

Q. I see.

Let me ask you about the top of page 15 with respect to cold shutdown. It is talking about:

"...assuring that fire damage to at least one train is limited such that it can be repaired within a reasonable time."

Do your criteria or standards define "reasonable time" in any way?

A. The requirements of Appendix R require that you have to be able to demonstrate the capability to get to cold shutdown within 72 hours.

So therefore if you are going to say I have something

in this area and it isn't needed for cold shutdown but it can burn up and I can repair it, you have to be able to repair it within a time period that will allow you to still get to cold shutdown in 72 hours.

Q. Okay.

Have the Applicants submitted such an analysis of damage to the Shearon Harris plant?

A. I don't recall any specific repairs. I do believe they have taken credit for a number of valves where they can go and manually operate them for cold shutdown. Which from our standpoint, manual operation is considered equivalent to a repair.

Q. Concerning the end of answer 22 on page 16 where you say you have concluded an equivalent level of protection has been provided, did anyone on the Staff dissent from any of those conclusions for any of those areas?

A. No.

Q. Are you gentlemen confident that one or the other of you would know about it if someone had?

A. Well since I wrote it and Mr. Ferguson approved it, I feel fairly confident that one of us would know.

Q. You were the only two involved?

A. And our branch chief and assistant division director.

Q. Four people were involved here?

A. Right.

A. (Witness Ferguson) I am reviewing our documents but I am sure if somebody dissented with something that was issued by us, we would hear about it very promptly.

Q. Are these determinations circulated then to a large number of other people?

A. Yes.

Q. About how many?

A. The distribution list has at least 17 names on it.

Q. Okay.

Answer 23 at the bottom says:

"The Applicants have" -- and I presume that the apostrophe there at the end of the third from the bottom line of that answer really shouldn't be there.

"Applicants' have committed to design suppression and detection systems in conformance with this guidance."

Have those systems been designed yet?

A. (Witness Eberly) Are you on page 17?

Q. Page 16.

A. Page 16.

Q. The bottom of answer 23.

I'm sorry, I am on your original copy. On your

revised one, it appears in answer 17. I wrote my questions out on your old version, so it is on page 17 on yours.

Are those systems that are referred to on those three lines at the top of page 17 designed yet?

A. I would assume so.

Q. But you don't know?

A. No, I don't.

Q. Will you-all be reviewing the design of them?

A. No, but we will be taking a look at it when we do our site walkdown in the field.

Q. Okay.

Will you have the design documents available to you before the walkdown?

A. Not before.

Q. All right.

Would the inspection of, you know, construction and installation in accordance with that design be up to Applicants' QA again?

A. Primarily. I believe our regional inspectors may also pay them a visit on occasion during construction.

Q. As to question 24 about whether the fire protection guidelines in 9.5.1 of the SRP relied solely on the response of the fire brigade or the operation of automatic extinguishing systems, do you know if Contention 116 says that either the review plan or the Applicants'

plan does rely solely on either of these?

A. (Witness Ferguson) I would stick with the same answer, that no, they don't rely solely on those.

Q Well I may have misphrasedmy question.

The question was: with regard to the question -- not with regard to the answer but with regard to the question does Contention 116 say that either the Applicants' plan for fire protection or the Standard Review Plan say that they rely solely on either of these matters discussed in this question?

A. (Witness Eberly) No, it doesn't.

Q Okay. Thank you.

On page.... I am trying to make sure that I have got the same page here.

It appears to me that in answer 24, which begins on page 17 of your corrected copy, if we go over on page 18 at the top is the language that I want to look at.

In that first full paragraph beginning on page 18 it says:

"...in spite of steps taken to reduce the probability of fire, fires are expected to occur."

Now what steps to reduce probability of fires are we talking about here?

A. The fire protection program that is adminstrative patrols, housekeeping, using noncombustible controls in construction, putting in sprinkler systems, putting in detection systems, and so on.

Q. Well, now does the sprinkler or a detection system prevent a fire from occurring?

A. No.

Q. So it's not really one of these, is it?

A. Well, no. What we're saying is despite the fact that you're putting fire protection in the plant you can't eliminate the possibility of a fire ever occurring?

Q. Well, I understand that. But what I'm asking is more specifically about this statement. Where it talks about steps taken to reduce the probability of fire.

Now I could, for example, have a warehouse full of sprinklers and that wouldn't say anything about the probability of a fire occurring in the warehouse, would it?

A. I guess it would depend on how you define a fire occurring.

A. (Witness Ferguson) I would say no. I think the early part of Mr. Eberly's testimony was directed toward this as essentially the administrative controls and housekeeping and that sort of thing.

Q. Okay.

Now, gentlemen, this long paragraph here in your corrected copy goes over from page 18 to 19, I just want to

ask you in general, and there's a lot of things where it says, "The fire protection program should insure that a fire will not cause loss of function of such systems, a backup manual firefighting capability should be provided through the plant. Portable equipment," and it lists it, "should be provided for use by properly trained firefighting personnel. Access should be provided. Adequacy of fire protection should be determined,"and so on.

What I want to ask you in line with what we've gone through before about the meaning of "should" is couldn't you just as well replace those "shoulds" by the word "must" in each case. Because of the requirements of your plan, review plan?

A. (Witness Eberly) That's correct. The answer you're seeing here on page 18 is primarily a discussion of our fire protection philosophy, but if you see how it has been implemented into our guideline, what you said is entirely correct. You could replace it with shall or must.

Q. All right.

A. (Witness Ferguson) The particular problem with should or shall is whether the information is in the guideline or in the regulation. The same words in the regulation would be shall, the same words -- the same meaning in the guideline would be should.

Q. Well, I believe you said -- and please clarify for

me -- didn't you say that in a particular case of fire protection that the Commission had ordered the Staff to evaluate whether, in fact, these particular guidelines for fire protection were met.

A. Yes.

Q. Okay.

On page, I believe it's 19 in your copy, you talk about fire protection starting with design and must be carried through all phases of construction and operation.

Now, does that then mean that the -- well, I think it's covered in your statement that the quality assurance program you're talking about there would have to cover all these phases that are discussed in the next sentence, design construction and operation.

Has the NRC evaluated CP&L's QA on fire protection, to your knowledge?

A. (Witness Eberly)
If the QA program is being evaluated by anyone, it's going to be region II, and I don't know if they've looked at it yet.

Q. Okay.

The answer 26 concerning the field visit,is that field visit the walkdown?

A. Yes.

Q. It says, "This visit can only be made at a very late stage of construction when the majority of the fire

protection systems have been installed. What percentage have to be installed in order for you to be able to do this walk-down?

A. Our general requirements on the timing of our site visits are that 95 percent of the cables inthe plant have been pulled and terminated. The second half being that we will call up our resident inspector at the site and ask him what is the physical status of construction, are there lots of scaffolding and other obstructions that if we came we couldn't see anything. And if there are, we will postpone it until the plant is fairly well cleaned up that we can get into the area to see the things that we are desiring to see.

Q. Okay.

And that would include things like the detectors, the sprinklers, piping, the wiring, and so on, that we discussed earlier?

A. That's right. It doesn't do us very much good if we go into a room in the plant and they say, well, here's where the pump is going to be. We'd like to see it there.

Q. Now, would you, in your opinion, have to audit QA to confirm that adequate defense indepth has been provided?

A. No.

Q. Do either of you gentlemen have knowledge of the number of fires that have occurred in areas containing

WRB/Pp 5

safety related equipment at nuclear power plants?

A. No.

A. (Witness Ferguson) No.

Q. You don't engage in any probability analysis?

A. (Witness Eberly) Not me.

A. (Witness Ferguson) We try to avoid it. We do review some of the analysis that has been done by licensees.

Q. Okay.

A. There are some specific numbers on that in the introduction section of the standard review plan that goes back to what was published back in 1976 or so.

End 22

Q. And that is in your Staff Exhibit 7, right?

A. Right.

Q. Let's see if I can get this straight.

Do fires affecting equipment necessary for shutdown of a nuclear plant which occur have to be reported to somebody at the NRC, to your knowledge?

A. (Witness Eberly) Yes.

Q. So that information could be found in the records as to how many had occurred --

A. Yes.

Q. -- when and how?

A. Yes, depending on the severity.

Q. Is there a kind of a lower threshold for reportable severity, is that what you are getting at?

A. I believe so.

Q. But you don't know what it is?

A. Not off the top of my head, no.

Q. When you gentlemen stated in answer 29 that the fuel oil day tanks were provided with all these various things in accordance with your guidelines, you did not intend, did you, to be deceptive in leaving out the deviation about the number of gallons in the tanks?

A. It wasn't our intent to be deceptive.

MRS. MOORE: Your Honor, I would object to this kind of questioning. The deviation -- the type of

deviation I believe is clearly set forth in the SER issued in November 1983. That is the deviation that was requested. It is not a ruling on the deviation but it was requested.

JUDGE KELLEY: There is a pending request for a deviation, is that right?

WITNESS EBERLY: No, it has been granted, your Honor.

JUDGE KELLEY: That has been granted?

WITNESS EBERLY: Yes.

JUDGE KELLEY: I thought you were objecting to the deception element.

MRS. MOORE: I am. I think that the characterization of being deceptive is an unwarranted characterization since Mr. Eddleman is on notice that deviations were requested in the SER which is also in the record of this proceeding.

JUDGE KELLEY: Okay. I agree. The question is asked and answered though, let's just go ahead.

MR. EDDLEMAN: I ask him did he intend, I didn't say he did.

JUDGE KELLEY: I think the objection still pertains. Why don't you go ahead?

MR. EDDLEMAN: That is really about all I had on that.

Let me see: this is about diesels, it is not about deceptions.

BY MR. EDDLEMAN:

Q. In answer 29 again you mention a manual release for the sprinkler system being provided for those diesel day tank areas.

Do you know where that release is located?

A. (Witness Eberly) No, I don't.

Q. Were you gentlemen involved in preparing the Staff responses to interrogatories from me to the Staff on Contention 116?

A. Yes.

Q. You are the same people identified there, right?

A. Yes.

Q. Okay.

Thank you very much, that completes my questioning.

JUDGE KELLEY: Okay.

Well it seems sensible to stop at this point.

Do you anticipate redirect?

MRS. MOORE: Very brief redirect.

JUDGE KELLEY: Well the Board may have a few questions but it is almost 6:00 and I think they want their speakers back anyway.

Is there anything else that we need to raise this evening?

You will recall that tomorrow we are going to have another one of these bucolic affairs in Apex. We will start at 9:00. I see no further comments.

One from Mr. O'Neill.

MR. O'NEILL: Mr. Chairman, the first day of the hearing we distributed an order of testimony presentation.

JUDGE KELLEY: Right.

MR. O'NEILL: With respect to Eddleman 9, which we assume we will start pretty early tomorrow, we had listed Applicants' eight panels and NRC Staff.

We have talked to -- and beginning with introductory piece and then 9A and 9B and 9C and on down.

We have talked with both Staff Counsel and Mr. Eddleman and both have agreed that we could put on first 9C, Mr. Miller and Dr. Dakin, which hopefully would allow Dr. Dakin to be excused and not have to return next week. He has some schedule conflicts next week and it seemed to be a reasonable adjustment of that schedule for that accomodation.

So we would move that the Board expect a change in the schedule in that respect.

JUDGE KELLEY: Fine. We appreciate your mentioning it now. It will affect our reading for tomorrow.

MR. O'NEILL: There is a second part of this motion.

JUDGE KELLEY: Okay. Granted in part.

MR. O'NEILL: The second part is Eddleman 9 is a series of seven disparate allegations regarding facets of environmental qualification program.

An NRC Staff witness is listed at the end of this order of presentation. However, for the clarity of the record and this proceeding, we would propose -- and Staff Counsel will agree -- Mr. Eddleman doesn't agree at the moment -- that after each of Applicants' panel that Mr. Masciantonio be put on the stand for cross-examining on his aspect of it so that we could close each of these separate issues as each area is completed. I think that will make it much easier to review the record and also, to the extent that our technical experts must remain until the end of the Staff testimony so we have someone to advise us, it allows them again to leave at the end of their proceeding. So that is the second part of our motion.

JUDGE KELLEY: How many out of town experts have you got, apart from Dakin and Miller?

MR. O'NEILL: Mr. Dakin and Mr. Miller are here from Pittsburgh. And Mr. Bucci and Mr. Pagan are here from New York. And of course our fire protection people will have to go back tomorrow.

JUDGE KELLEY: We should be through with them,

though, fairly early in the morning, I would think.

Did you particularly desire to get out of here today or is that all right?

MRS. SERBANESCU: It is all right.

JUDGE KELLEY: I would think we should be done at 10:00 or 10:30, something like that.

Okay. I understand the second part. So did Mr. Eddleman.

Do you have a problem with that?

MR. EDDLEMAN: Yes, Judge. I think this is what is called by the lawyers a vigorous objection. I think it is far too late to be bringing this stuff up. I first heard about it this morning and I would like to point out a couple of things about this.

The first thing is that the Applicants themselves prepared this order and made a motion -- a propo[illegible] with the other parties to approve it. We went to [illegible] Board and read it into the transcript. I think [illegible] they had problems with it it was their responsibili[illegible] to take care of that. I relied on it in preparing my plan for how to work up cross on these things; it is a lot of work. This throws it off.

I would also point out that as to Mr. Miller and Mr. Dakin, I think Dakin is the one that has got the time problem and we are taking care of him by putting him first, which I have agreed to.

Bucci and Pagan are all the way up to 9G anyway, and they've got to stay here to the end anyhow. And as a practical matter of fact, we are not going to get those guys out of here any faster by having the Staff witness come on after each part or not.

But I just think that it is very unfair of the Applicants to spring this on me at the last minute, really even beyond the start of the hearing. I've heard them numerous times saying well, if you want to change the schedule, you should at least say it at the start of the hearing. That was not done in this case.

And I come back to the last part which is they prepared the schedule, and doggone it, at this point I think they should have to stick to it.

JUDGE KELLEY: Well, I think the point that I at least would like to focus on the most with you, so I understand it exactly, is how are you prejudiced in practical terms by this kind of a change?

MR. EDDLEMAN: Well, I think in several ways.

First, if they really talk about closing out an issue, to the extent that some of these issues might interrelate, I certainly would have my best chance to tie this up with the Staff's witness who covers all of them.

In other words if I asked Applicant about it they may say, well, you know that's the next panel, that's Smith

and Jones or, you know, that's Brown and Green. And it may be a little hard to tie those things together.

Also I think it throws my preparation off terribly because I'm working on my questions for the Staff independently, and I put that off until the end. I haven't touched it. I thought that was something I would, you know, start working on next week. I mean there's a lot of witnesses between now and the Staff's on this schedule.

Also I'm worn out myself, and I just don't know if I can deal with it. I really don't.

JUDGE KELLEY: Is it possible to isolate the portions of Mr. -- is it Masciantonio? Is that the correct pronunciation?

MRS. MOORE: That's correct, your Honor.

JUDGE KELLEY: -- and the portion or portions of his testimony that have to do with the related testimony of Witnesses Miller and Dakin?

MRS. MOORE: Yes, your Honor.

When I was approached by Applicants' Counsel I agreed to this motion but I wanted it understood that cross-examination would only be on specific pages of the testimony which I would mention at the time that the cross-examination began.

We have-- I believe if you look at the Staff's testimony, each item is separately set out. It is not a

separate question, but it is preceded by a quote of the concern, so that you can split out each of the concerns in the contention.

JUDGE KELLEY: Part C if you will?

MRS. MOORE: Yes, you could split out Part C.

JUDGE KELLEY: You indicate that you consent to this proposed change. Do you support it enthusiastically? Do you do this with reluctance? Do you think it is a good idea or a bad idea yourself?

MRS. MOORE: I can't say I was enthusiastic about it. It is easier for a witness to be on the stand once of course, but I understood there was some need for Applicants' witnesses, certain of them, to leave earlier, and I agreed to it on that basis.

JUDGE KELLEY: What about Mr. Eddleman's point that your other two out-of-town witnesses, I think from New York, are last anyway?

MR. O'NEILL: With respect to the other out-of-town witnesses, that's true. But certainly some of the other Applicants' witnesses who are even here at the site could go back to work rather than sit back for a week.

JUDGE KELLEY: That's true.

MR. O'NEILL: I think equally important, quite frankly, is just that just this record make some sense when one is going through it, and that we motion we made will

certainly do that.

And I find it hard to really believe that Mr. Eddleman is prejudiced to the extent that one would think it would be easier to prepare one's cross-examination on the subject matter, looking at the Arrhenius theory once rather than doing it now and then seven days from now. I think it would be much easier for the Board and all the parties to follow if we don't talk about the Arrhenius thermal agent of RTDs with a week's interregnum.

I suggest it might make a lot more sense to do it all at once.

JUDGE KELLEY: I think we understand the basic points.

Let me ask whether-- Obviously we haven't talked about this. We have already decided we will start with 9C, and Miller and Dakin tomorrow in mid-morning.

Is there any reason we can't rule on Part 2 of your motion, whether Mr. Masciantonio's appearance should be bifurcated or trifurcated, or whatever the word is, tomorrow morning as opposed to now?

MR. O'NEILL: I think in fairness to Mr. Eddleman we probably should let him know tonight whether he should prepare for Mr. Masciantonio's cross.

MR. EDDLEMAN: With some reluctance, if it would help-- I mean I think it does do me some damage but I know

you have to do adjustments now and again.

Let me respond to some of these things that have been said.

JUDGE KELLEY: All right.

MR. EDDLEMAN: One thing is about the other folks getting back to work. I don't see any reason why when they are not on the stand they have to sit here and see the other panels of their own people on. They would only have to come back the day that Masciantonio is on and that might actually be less out of their time than this set-up.

The other thing is it would be a lot easier for me to conduct cross of this witness in the areas I was talking about without the restriction that Mrs. Moore was talking about that you can only ask him about certain parts of his testimony at a time. Then I can't even ask him is that consistent with your testimony there or there or if I want to I have got to be able to remember it for days because I don't have the instant transcripts that these folks have.

JUDGE KELLEY: Well that is significant. I guess without thinking, it is true, I thought Mrs. Moore was doing you a favor by saying we will restrict it to page eight, lines 10 through 17, something like that. And you are saying that that is going to hamper you, is that right?

MR. EDDLEMAN: Well in that respect, yes. In other words, it would be shorter pieces to prepare for it but there wouldn't be the opportunity to interrelate or to ask consistency across the treatment of different things.

I also think it would probably be more efficient in terms of my cross to have him up there once and to ask him these things rather than by going to it several times: in one area, one area, one area, I am probably more likely to take more total time with him than if I have him there once.

Now as to this question of getting everything together in the transcript, I think all of us are perfectly competent to find where his testimony starts and flip back and forth in the trancript to where the other people's is and compare it, I think we can do that. So I don't see that as any great advantage.

JUDGE KELLEY: Just as a point of information, the portion of Mr. Masciantonio's testimony that would pertain to Part C and this first panel we are going to have tomorrow, can you identify that in the testimony?

MRS. MOORE: I am afraid I don't have it right with me at the moment. Can I have a moment to see if I can locate it?

JUDGE KELLEY: Sure.

(Pause.)

JUDGE KELLEY: Is the gentleman here from the sound system people?

VOICE: I don't believe he is here yet. He said he would be here around 6:00.

JUDGE KELLEY: Are we discombobulating him unduly, do you know?

VOICE: I don't know.

JUDGE KELLEY: I appreciate your talking to him. Thanks a lot.

MRS. MOORE: Your Honor, I have the answer if you would like.

JUDGE KELLEY: Sure.

MRS. MOORE: It is the bottom of page 11 through the top of page 14.

JUDGE KELLEY: So it is about three pages.

MRS. MOORE: Yes.

JUDGE KELLEY: Excuse us a moment.

(The Board conferring.)

MRS. MOORE: Your Honor, can I interrupt you for a moment? I made a mistake. It goes to page 16. I apologize.

JUDGE KELLEY: Thank you.

(The Board continuing to confer.)

JUDGE KELLEY: We are going to give an interim direction in contemplation of a full ruling on this issue

the first thing in the morning.

The interim direction is to Mr. Eddleman to familiarize yourself with those pages from the bottom of 11 to 16 that was just referred to by Mrs. Moore.

This does not necessarily foreshadow a ruling against you and in favor of the motion, but it just seems that it is not that much material to take a look at and so we are asking you to go ahead and do that tonight and we will speak to it tomorrow morning.

MR. EDDLEMAN: All right.

JUDGE KELLEY: -- in Apex.

We don't have anything else. It is 6:00, let's adjourn.

(Whereupon, at 6:00 p.m., the hearing in the above-entitled matter was recessed, to reconvene at 9:00 a.m., the following morning at the ECU Room, Ramada Inn, U.S. 1 South, Apex, North Carolina.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING:

CAROLINA POWER AND LIGHT COMPANY
and NORTH CAROLINA EASTERN MUNICIPAL
POWER AGENCY

(Shearon Harris Nuclear Power Plant,
Units 1 and 2_

DOCKET NO.: 50-400-OL & 50-401-OL

PLACE: Raleigh, North Carolina

DATE: October 18, 1984

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(Sigt) William R. Bloom
(TYPED) William R. Bloom

Official Reporter

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