

1 MR. NELSON: And you have no independent  
2 basis for making those assertions?

3 DR. RESNIKOFF: That's right.

4 MR. NELSON: Okay. So, hypothetically, if  
5 I told you that it's been demonstrated that the casks  
6 won't tip over under peak acceleration, ground  
7 acceleration of a 2,000-year earthquake, that would  
8 get rid of all your concerns, if that were true, that  
9 they won't tip over? Is that correct?

10 DR. RESNIKOFF: That's right. I start  
11 from the assumption that the casks tip over.

12 MR. NELSON: Okay. I would like to talk  
13 now a little bit about the consequences that you  
14 postulate if they tip over.

15 Just for the record, I think I'm under the  
16 15 minutes. I appreciate your indulgence.

17 (Laughter.)

18 I have Mr. Gaukler to try to keep pace  
19 with in not using too much time.

20 CHAIRMAN FARRAR: Good job.

21 MR. TURK: I may ask for a few of those  
22 minutes, Your Honor.

23 (Laughter.)

24 MR. NELSON: I would gladly give them to  
25 him.

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1                   So implicit in the questions I just asked  
2                   you, you've never conducted any, outside of this  
3                   proceeding, any cask stability analyses yourself, have  
4                   you?

5                   DR. RESNIKOFF: That's right.

6                   MR. NELSON: And you haven't here, because  
7                   you testified you rely on other State witnesses, is  
8                   that correct?

9                   DR. RESNIKOFF: That's right. We did look  
10                  somewhat into one issue involving velocity as the cask  
11                  passed its balance point, just to determine whether  
12                  the acceleration would be greater as it hit the  
13                  ground. So, in that sense, we looked at cask  
14                  stability.

15                 MR. NELSON: All right, and I will be  
16                 getting to that in a little bit. But, other than  
17                 that, you haven't done any cask stability analyses,  
18                 and in that case -- sorry to make this complex; strike  
19                 the first part. In that case, you were just looking  
20                 at the potential effects of a greater than zero  
21                 initial angular velocity, is that correct?

22                 DR. RESNIKOFF: That's right.

23                 MR. NELSON: You weren't looking to see  
24                 whether or not the cask would tip over to begin with,  
25                 just what happens when it tips over?

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1 DR. RESNIKOFF: That's right.

2 MR. NELSON: And you don't have any  
3 specific -- you haven't conducted or have any  
4 background in the kind of dynamic analyses that, for  
5 example, Dr. Ostadan talks about in his testimony, do  
6 you?

7 DR. RESNIKOFF: No.

8 MR. NELSON: Have you ever reviewed a  
9 simulation -- or have you ever reviewed a simulation  
10 of a cask tip over or drop, either for the  
11 appropriateness of the specification of that model,  
12 how that model is put together, or the interpreting of  
13 the results of that analysis?

14 MS. CURRAN: Objection. I guess request  
15 for clarification. Are we still in the 15 minutes?  
16 I thought you had finished.

17 MR. NELSON: Your Honor, I have moved on  
18 to other questions about his qualifications, not what  
19 he is relying upon. I think I would appreciate it if  
20 counsel would withdraw the objection.

21 CHAIRMAN FARRAR: Why don't we just  
22 overrule it.

23 MR. NELSON: Do you remember the question?  
24 I'm sorry.

25 CHAIRMAN FARRAR: Yes, go ahead, but,

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1 again, let's not belabor this. Overruled.

2 MR. NELSON: Would the answer to my last  
3 question be no?

4 DR. RESNIKOFF: No, the answer would be  
5 yes in this case. I have, so far as transportation  
6 casks are concerned, I have looked at cask drops; I've  
7 looked at, I've read papers concerning the impact.

8 MR. NELSON: Have you looked at storage  
9 cask drops?

10 DR. RESNIKOFF: No. Just can I take that  
11 back?

12 MR. NELSON: Sure.

13 DR. RESNIKOFF: I did look at the paper  
14 concerning the 25-foot drop.

15 MR. NELSON: Okay, but you didn't -- you  
16 weren't a technical reviewer on that in any capacity?  
17 The thrust of my -- you weren't the technical  
18 reviewer? You just reviewed that in looking at your  
19 analysis of the angular velocity?

20 DR. RESNIKOFF: I reviewed it to see  
21 whether I was comfortable with it, reviewed insofar as  
22 whether a cask would drop directly downward or whether  
23 the cask might drop at a tilt.

24 MR. NELSON: You said you were not  
25 familiar with the hearing testimony that had gone on

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1 so far in this proceeding, is that correct? You  
2 testified earlier, if I recall, that you haven't  
3 reviewed hearing transcripts?

4 DR. RESNIKOFF: That's true.

5 MR. NELSON: So are you aware that on --  
6 actually, let me distribute it.

7 DR. RESNIKOFF: Counsel, does "hearing  
8 transcripts" also imply deposition transcripts?

9 MR. NELSON: No, not in terms of what I  
10 was asking you about; just what has been going on as  
11 part of this proceeding.

12 What I'm having distributed as a courtesy  
13 copy is portions of the hearing transcript from May  
14 8th, 2002, a couple of pages out of that hearing  
15 transcript. I would like to turn your attention to  
16 page 7,391.

17 Judge Lam asks a question to Dr. Ostadan,  
18 starting on line 6, and he said, "Before we take a  
19 break, let me follow up with one question. Applicant  
20 counsel asked you, Dr. Ostadan, and you mentioned that  
21 ALTRAN had done some study. May I follow up on that?  
22 Dr. Kahn, in his analysis, one of the cases that he  
23 illustrated using ANCIS, one of the casks appeared to  
24 be flying, was actually lifting 2 feet about the  
25 ground in horizontal movement of 20-30 feet. Now I'm

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1 fully aware, Dr. Ostadan, that you testified that non-  
2 linear analyses are extremely sensitive to input. Do  
3 you have an opinion as to if this is a realistic case  
4 that we are looking at?" .

5 Did I read that question correctly?

6 DR. RESNIKOFF: Yes, you did.

7 MR. NELSON: And Dr. Ostadan replied,  
8 "Yes, Your Honor, I do not think Dr. Kahn's analysis  
9 was intended to be a design calculation. It was  
10 merely intended to indicate how sensitive this  
11 analysis could be with respect to the change of input  
12 parameters, which in this case turned out to be  
13 vertical. They're dealing with stiffness of the  
14 contact. I do not believe that those numbers are  
15 accurate, so to speak."

16 Do you read that?

17 DR. RESNIKOFF: You did read that  
18 correctly, yes.

19 MR. NELSON: Then on page 7,392 there's a  
20 followup. Judge Lam asks, "So this licensing board  
21 should only look at these results by Dr. Kahn in that  
22 context and not be concerned about flying casks?"

23 To which Dr. Ostadan replied, "I would not  
24 look at it this way. I would only look at it from the  
25 point of view that these analyses should be or are

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1 very sensitive."

2 Is that correct?

3 DR. RESNIKOFF: You've read that  
4 correctly.

5 MR. NELSON: Does Dr. Ostadan's testimony  
6 change your opinion of whether you think your results  
7 model anything that would occur in reality?

8 DR. RESNIKOFF: I started from the point  
9 of view that the casks tip over and to calculate the  
10 dose consequences.

11 MR. NELSON: So it wouldn't matter to you  
12 if Dr. Ostadan or Dr. Kahn didn't think that their  
13 analyses reflected what might happen to a cask?

14 DR. RESNIKOFF: I'm just not familiar with  
15 the inputs to these computer programs and whether, if  
16 you change some, the casks will fall over, and if you  
17 don't change some, then the casks may not. I'm not  
18 familiar with that.

19 MR. NELSON: All right, let's turn, then,  
20 to the mechanisms that you describe for possible  
21 damage to the HI-STORM 100 casks. I'm looking at  
22 Answer 16, which I believe summarizes your concerns  
23 about the effects or the hypothetical HI-STORM 100  
24 storage cask tipover analysis. As I understand Answer  
25 16, your testimony there, that you're concerned with

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1 three things, and let me see if I can get this right.

2 First, the assumption of the zero angular  
3 velocity is unfounded. Second, the deceleration at  
4 the top of the canister may be greater than 45 G, and,  
5 three, that you believe that PFS has failed to support  
6 its assertion that the MPC has substantial margins  
7 above and beyond the 45 G value. Would that be an  
8 accurate summary of your concerns there?

9 DR. RESNIKOFF: That would be.

10 MR. NELSON: Okay. With respect to the  
11 issue of initial angular velocity, as I understand  
12 what's in your testimony, you have not attempted, or  
13 at least you haven't put in the testimony itself what  
14 you think an initial angular velocity might be, is  
15 that correct?

16 DR. RESNIKOFF: That's right, I did not.

17 MR. NELSON: But now earlier I thought you  
18 talked about that you had looked into trying to  
19 calculate that? Is that a correct recollection?

20 DR. RESNIKOFF: No, I did not try to  
21 calculate that. I did ask our other experts what is  
22 the angular velocity and is zero correct, and their  
23 opinion is that the zero initial angular velocity  
24 could be greater than zero, and that is what that  
25 sentence is based on.

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1 MR. NELSON: So you don't have any  
2 independent basis for saying whether or not the  
3 initial angular velocity should be greater than zero  
4 or not?

5 DR. RESNIKOFF: No, my basis for that is  
6 simply a common-sense opinion, and that is that, if  
7 the earth is moving and accelerating in various  
8 directions, that the initial angular velocity could be  
9 greater than zero.

10 MR. NELSON: All right, what I am having  
11 distributed and would like marked as PFS Exhibit 240  
12 is a copy, a manuscript copy of your -- a transcript  
13 of your deposition on October 29th, 2001 with Mr.  
14 Gaukler.

15 [Whereupon, the above-referred-  
16 to document was marked as PFS  
17 Exhibit 240 for  
18 identification.]

19 MR. NELSON: I would like to turn your  
20 attention -- I lost the page number. Page No. 70.

21 Mr. Gaukler asked you, "How do you plan on  
22 calculating the angular velocity at which the cask  
23 tips over?" Do you see that question?

24 DR. RESNIKOFF: I do.

25 MR. NELSON: And you said, "I haven't

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1 worked out the details yet." So is it your testimony  
2 today that you still haven't worked out those details  
3 or tried to work out those details?

4 DR. RESNIKOFF: I focused on those  
5 consequences if a cask tips over; that was my  
6 testimony for today.

7 MR. NELSON: Well, help me understand this  
8 because I would think that to understand what the dose  
9 consequences are you have to determine what kind of  
10 damage occurs to a cask. You were asserting in your  
11 testimony that damage is going to occur because the  
12 cask tips over with an angular velocity greater than  
13 zero. How do you know how much damage occurs in order  
14 to do your radiological dose calculations if you don't  
15 know how to calculate the angular velocity of tipover?

16 DR. RESNIKOFF: Counsel, you need to ask  
17 your own witnesses the same question. They have given  
18 the same qualitative answer, and that answer is,  
19 there's going to be cask flattening, and that's all  
20 that I can say as well. I haven't actually done the  
21 actual calculations that would estimate that. If you  
22 give me a certain initial velocity, I could estimate,  
23 then, what the accelerations would be as it hit the  
24 ground, but we haven't done that kind of calculation.  
25 As we sit here today, I still haven't.

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1 MR. NELSON: How would you know, if you  
2 can't do that calculation, then you don't know what  
3 the radiological dose consequences of that falling  
4 are. You are the one who is asserting that the  
5 initial angular velocity of zero is incorrect. What  
6 should the initial angular velocity be?

7 DR. RESNIKOFF: I don't know the answer to  
8 that question. I haven't done that calculation. If  
9 the cask flattens, there would be an increased dose.  
10 That's all I can say at this time.

11 MR. NELSON: So you don't know how much  
12 flattening and subsequent damage to the cask would  
13 occur, is that correct?

14 DR. RESNIKOFF: That's correct.

15 MR. NELSON: And you don't know how much  
16 steel stretching or thinning would occur, is that  
17 correct?

18 DR. RESNIKOFF: That's right, I have not  
19 quantified that.

20 MR. NELSON: Have you quantified anything  
21 in relation to damage to the cask, the MPC, the fuel  
22 assemblies at all?

23 DR. RESNIKOFF: Only insofar as we've  
24 estimated what exposures come out of the bottom of the  
25 cask and also we've looked into heatup and increased

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1 neutron dose due to hydrogen loss.

2 MR. NELSON: All right. Taking aside,  
3 leaving aside for the moment potential for heatup and  
4 hydrogen loss, and the tipover with the bottom of the  
5 casks facing the boundary, which we'll talk about in  
6 a little while, it seems to me that as a practical,  
7 common-sense, logical matter that you can't do an  
8 analysis of radiological dose consequences if you  
9 don't how much damage occurs to a cask, is that  
10 correct?

11 DR. RESNIKOFF: Well, no, that's not  
12 correct. We've, under the conditions that are  
13 specified in my testimony, we've estimated what the  
14 radiation exposures would be. If other events occur,  
15 cask flattening, micro-cracking of the concrete, steel  
16 stretching, if any of these other events occur, that  
17 would increase the dose, but we have not done that  
18 estimate.

19 MR. NELSON: Okay, I think you got around  
20 to answering my question. My question simply was, in  
21 terms of just the damage caused by flattening,  
22 deformation, cracking of the concrete, thinning,  
23 stretching, all those things, leaving aside those from  
24 the bottom and leaving aside the loss of shielding due  
25 to a hydrogen loss in the concrete, you haven't

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1 estimated the radiological consequences of any of  
2 those things? Is that correct?

3 DR. RESNIKOFF: That's correct, and  
4 neither has the applicant.

5 MR. NELSON: In the hypothetical cask  
6 tipover, they do estimate concrete deformation, don't  
7 they, Holtec?

8 DR. RESNIKOFF: They do.

9 MR. NELSON: So they have looked at that  
10 for that case, correct?

11 DR. RESNIKOFF: They've looked at it so  
12 far as out-of-roundness is concerned.

13 MR. NELSON: In taking these things into  
14 account, they have said that the effect, the potential  
15 effect, of these possible mechanisms is negligible, is  
16 that correct?

17 DR. RESNIKOFF: I need to define what  
18 negligible is. They've done it in the context of  
19 whether the overpack would lose its roundness, so that  
20 the MPC could not be recovered.

21 MR. NELSON: Don't they also address  
22 radiation doses in that report? They don't just look  
23 at whether or not the MPC can be recovered. They look  
24 at what effect on radiation shielding that would have,  
25 isn't that correct?

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1 DR. RESNIKOFF: I think I would like to go  
2 back and take a look at that appendix before I answer  
3 that question.

4 MR. NELSON: Counsel, can -- which  
5 appendix are you talking about?

6 DR. RESNIKOFF: I think it's 3A or 3B in  
7 the SAR.

8 MR. NELSON: All right, let's go on to the  
9 second issue that you talk about in terms of  
10 deceleration at the top of the canister. In Answer 16,  
11 subparagraph (b), you say that, "From this" -- and I  
12 take it in that sentence "this" refers to your belief  
13 that the initial angular velocity may be greater than  
14 zero, is that correct?

15 DR. RESNIKOFF: That's correct.

16 MR. NELSON: Okay. "From this, you can  
17 conclude that the top of the canister will decelerate  
18 at greater than 45 G in exceedance of the 45 G design  
19 basis, thereby damaging the fuel assemblies." Is that  
20 correct? Did I read that correctly?

21 DR. RESNIKOFF: That's correct. That's  
22 what it says.

23 MR. NELSON: Is that what you still  
24 believe?

25 DR. RESNIKOFF: I believe the first part

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1 of it, but the second part I think really should say  
2 the damage would occur at 63 G to the fuel assemblies.

3 MR. NELSON: Okay, to the fuel assemblies?

4 DR. RESNIKOFF: Right, the first part is  
5 it would be in exceedance of the 45 G design basis.  
6 That comes from the Certificate of Compliance.

7 MR. NELSON: Uh-hum. And so would you  
8 like to amend that second part of that sentence to  
9 properly reflect what you think would be an accurate  
10 description?

11 DR. RESNIKOFF: I think it's inaccurate.

12 MR. NELSON: You think it's inaccurate?

13 DR. RESNIKOFF: Yes.

14 MR. NELSON: Okay.

15 DR. RESNIKOFF: It should say -- it  
16 depends, of course, on what "G" is, that is, what the  
17 initial angular velocity is, but if the deceleration  
18 is as high as 63 G, it would damage the fuel  
19 assemblies; if it's less, according to Lawrence  
20 Livermore, it would not.

21 MR. NELSON: It would not damage the fuel  
22 assemblies?

23 DR. RESNIKOFF: Yes. It depends on what  
24 the initial velocity is.

25 MR. NELSON: And going back to our earlier

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1 discussion, you don't know what an appropriate initial  
2 angular velocity would be? So you don't know whether  
3 -- I'm sorry, let me let you answer that question.

4 DR. RESNIKOFF: No, if it's greater than  
5 zero, then the first sentence is always -- the first  
6 part of that conclusion is true. I think it depends  
7 on the actual velocity on whether the second part of  
8 that sentence is true.

9 MR. NELSON: Now as I understand your  
10 testimony in Answer 16, subparagraph (b), that --  
11 actually, let me take a step back. Do you what  
12 initial angular velocity would be required to cause  
13 deceleration of the fuel assemblies at 63 G?

14 DR. RESNIKOFF: I haven't done that  
15 calculation.

16 MR. NELSON: And so you view this as an  
17 unresolved -- is it accurate to say that you view this  
18 as an unresolved safety issue because you do not think  
19 Holtec has adequately substantiated the margins in its  
20 calculations or test data? Would that be accurate?

21 DR. RESNIKOFF: That's right.

22 MR. NELSON: Hypothetically, if the  
23 initial angular velocity is zero, then you don't have  
24 any concern about deceleration being greater than 45  
25 G? Would that be correct?

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1 DR. RESNIKOFF: It's right at the margin.

2 MR. NELSON: Did you hear the testimony  
3 and read the testimony of Dr. Singh describing, I  
4 think his number, if I remember correctly, was that  
5 the MPC can withstand a 300 G force without  
6 compromising the integrity of the MPC? Do you recall  
7 that testimony?

8 DR. RESNIKOFF: I recall him saying that.

9 MR. NELSON: I'm not asking you to agree  
10 with it, but, hypothetically, if he's correct -- well,  
11 let me take a step back. You have no basis to  
12 disagree with that? Is that correct?

13 DR. RESNIKOFF: There is nothing to agree  
14 or disagree with. There's no support. You know,  
15 where was I to go with it?

16 MR. NELSON: Wasn't the 300 G generated  
17 from the calculation involving the 25-foot drop of the  
18 MPC? Isn't that where he provided his support? Do  
19 you disagree with that calculation?

20 DR. RESNIKOFF: I have to say I don't  
21 remember seeing the 300 G number in that report.

22 MR. NELSON: Do you disagree with how that  
23 report was calculated?

24 DR. RESNIKOFF: No, I have to say I don't  
25 remember seeing a 300 G number in that report.

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1 MR. NELSON: I understand that. I'm  
2 asking you more broadly about that report. Do you  
3 disagree with how that was calculated?

4 DR. RESNIKOFF: I think I really need to  
5 see the report in front of me and look at it.

6 MR. NELSON: So sitting here right now,  
7 you don't know whether you agree or disagree with how  
8 that report was calculated, the methodology involved  
9 with that, is that correct?

10 DR. RESNIKOFF: I had some disagreements  
11 with it; that is not correct.

12 MR. NELSON: Do you remember what those  
13 disagreements are, sitting here right now?

14 DR. RESNIKOFF: The disagreements involved  
15 whether the cask would fall flat or land on its edge.

16 MR. NELSON: Those don't sound like  
17 methodological questions. That's not really a  
18 methodological question, is it? Assuming that it fell  
19 flat, those results, you have no reason to disagree  
20 with those?

21 DR. RESNIKOFF: I really need to look at  
22 the report, you know, again, if you're going to ask me  
23 a detailed question about it.

24 MR. NELSON: Okay. You refer in Answer 17  
25 through 22 to all these different mechanisms that

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1 could cause an increase in radiation dose. Are all of  
2 these theoretical, looking at Answers 17, 18, 19, 20,  
3 21, 22, are all of these theoretical concerns for  
4 which you have no estimates to provide, but they are  
5 things that you think had not been adequately  
6 addressed? Is that correct?

7 MR. TURK: May I ask for clarification?  
8 Which concerns are you addressing now? All of the  
9 concerns in --

10 MR. NELSON: All of the concerns in those  
11 five or six answers.

12 MR. TURK: Which answers are those?

13 MR. NELSON: Answers 17 through 22.

14 I think, as I recall the testimony,  
15 involve flattening, cracking, thinning, stretching of  
16 the metal, all those postulated mechanisms for cask  
17 damage; lid impact I think was included in there as  
18 well, cask lid impact.

19 DR. RESNIKOFF: Seventeen through 22, was  
20 that what you said, Counsel?

21 MR. NELSON: That is.

22 DR. RESNIKOFF: Yes.

23 MR. NELSON: Okay. All right, then I  
24 think then what we will do is move on to your concern  
25 about cask heatup.

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1                   Actually, may I have a moment, Your Honor?

2                   (Pause.)

3                   Actually, stepping back, in those  
4 mechanisms that you postulate in Answers 17 through 22  
5 -- 21, Answers 17 through 21, to try to speed things  
6 along, I'm trying to understand your basis for your  
7 concerns that these mechanisms might have an effect on  
8 radiological dose.

9                   If we look at the mechanisms that you  
10 postulate, steel stretching or thinning, concrete  
11 cracking, concrete deformation, have you ever done  
12 calculations of any of those things before?

13                   DR. RESNIKOFF: Yes and no is the answer.

14                   MR. NELSON: Okay, would you mind walking  
15 through with me and telling me which are yes and which  
16 are no?

17                   DR. RESNIKOFF: So far as concrete  
18 cracking is concerned, we, I have looked into what  
19 would happen if it were a crack in a transportation  
20 container. That's not a concrete container; it's a  
21 metal container. In other words, what would be the  
22 radiation exposures if you had a crack of a certain  
23 width?

24                   But I have not looked into the effect of  
25 dose on concrete cracking. It was my original

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1 intention to do so, but I could not get a reliable  
2 estimate of how much that cracking could be. So I  
3 never proceeded with that calculation.

4 So the answer, there is yes and no. We've  
5 done, I've done some calculations involving cracking  
6 of a cask and also a hole in the cask, but not a  
7 concrete cask.

8 MR. NELSON: Is the cracking mechanism in  
9 a transportation cask the same as the mechanism for  
10 cracking of concrete?

11 DR. RESNIKOFF: I don't know the answer to  
12 that, but I'm starting from a different premise. I'm  
13 starting from the width of the crack and the thickness  
14 of the container, and from there going to an estimate  
15 of what the radiation exposures are. So I don't know  
16 the answer to that question, but it's not a question  
17 that I need to answer to do my calculations.

18 MR. NELSON: You would need an answer as  
19 to whether or not the concrete cracks in the first  
20 place and the extent to which it is cracked before you  
21 would have any expertise in that area, is that  
22 correct?

23 DR. RESNIKOFF: That's right.

24 MR. NELSON: Would that be true for  
25 deformation as well, that you haven't modeled or don't

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1 have expertise or experience in modeling how the  
2 deformation occurs, but once you have a certain amount  
3 of deformation, you would take over and be able to  
4 evaluate the effect of that? Is that correct?

5 DR. RESNIKOFF: That's right.

6 MR. NELSON: And is that the same for all  
7 these mechanisms that we're postulating, that you  
8 don't necessarily have, that you don't have expertise  
9 in how they occur or the extent of their occurring,  
10 but if you're given a known quantity of something,  
11 flattening, thinning, or stretching of steel, you  
12 would be able to then evaluate the radiological dose  
13 consequences of that? Is that accurate?

14 DR. RESNIKOFF: That's right, except are  
15 you including Answer 22 in it which is heatup?

16 MR. NELSON: No, I wasn't because I  
17 understand that you have -- that's a different issue.  
18 No, I'm not including --

19 DR. RESNIKOFF: Okay, then yes is the  
20 answer.

21 MR. NELSON: Okay. So someone else would  
22 have to sort of give you that known quantity of  
23 cracking or deformation or thinning or stretching for  
24 you to do your analysis? Is that accurate?

25 DR. RESNIKOFF: Yes.

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1 MR. NELSON: So you don't have any  
2 independent basis for estimating the amount of any of  
3 these mechanisms up through and including Answer 21  
4 that would or might occur to a storage cask under a  
5 seismically-induced accident, do you?

6 DR. RESNIKOFF: Which ones, which answers  
7 are we going through?

8 MR. NELSON: Seventeen through 21.

9 DR. RESNIKOFF: I have not estimated any  
10 of those effects or --

11 MR. NELSON: Okay, let's go to your Answer  
12 22. In Questions and Answers 22 and 23 you discuss  
13 the potential for loss of shielding to evaporation of  
14 hydrogen from the cask, is that correct?

15 DR. RESNIKOFF: That's correct.

16 MR. NELSON: And I was looking at your CV,  
17 which has been marked as State Exhibit 134, and given  
18 your past testimony at depositions, am I correct that  
19 you have not done before this calculation a  
20 calculation regarding the heatup of a storage cask?  
21 Is that correct?

22 DR. RESNIKOFF: Other than in this PFS  
23 proceeding, where, as you are aware, we've looked into  
24 heatup of casks under Contention H --

25 MR. NELSON: Right, but other than that,

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1 that was your first time doing this sort of  
2 calculation? Is that correct?

3 DR. RESNIKOFF: Yes and no is the answer.

4 MR. NELSON: Yes is the easy part. What  
5 about no.

6 (Laughter.)

7 DR. RESNIKOFF: No is, to do this  
8 calculation involves some knowledge of cross-sections,  
9 some knowledge of neutron removal cross-sections. I  
10 have taken courses in nuclear physics. I know about  
11 cross-sections.

12 MR. NELSON: Okay. In terms of the --  
13 let's start with the heat transfer portion of it. You  
14 haven't performed any safety-related calculations in  
15 the general area of heat transfer that were either  
16 subjected to a quality assurance program review or  
17 peer review or that sort of thing, have you?

18 DR. RESNIKOFF: No, we haven't done that  
19 kind of thermal analysis.

20 MR. NELSON: Okay, so this is the first  
21 time that you've done that kind of thermal analysis?

22 DR. RESNIKOFF: This is the first time  
23 we've done thermal analysis, yes --

24 MR. NELSON: Okay, and that include --

25 DR. RESNIKOFF: -- other than Contention

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1 H.

2 MR. NELSON: Okay, sure, and that would  
3 include thermal degradation of concrete? That's the  
4 first time you've done that in this proceeding?

5 DR. RESNIKOFF: That's right.

6 MR. NELSON: Now in your calculation, in  
7 reviewing it, you didn't actually try to calculate the  
8 actual loss of hydrogen due to the heating of the  
9 concrete cask, did you? You didn't try to model that?

10 DR. RESNIKOFF: I'm not sure I understand  
11 the question, Counsel.

12 MR. NELSON: Well, as I read your  
13 calculation, and please correct me if I'm wrong, don't  
14 you assume that all hydrogen has evaporated out of the  
15 cask? There's no shielding whatsoever from hydrogen?  
16 Is that correct?

17 DR. RESNIKOFF: Our calculations just  
18 assume that the hydrogen is not present and doesn't  
19 provide shielding.

20 MR. NELSON: And --

21 DR. RESNIKOFF: That doesn't mean that it  
22 has escaped from the cask.

23 MR. NELSON: You just don't take credit  
24 for any of it?

25 DR. RESNIKOFF: That's right.

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1 MR. NELSON: So you don't know how -- you  
2 didn't try to model how much would actually be there?  
3 You said, what if none of it is there to shield the  
4 neutron dose, is that correct?

5 DR. RESNIKOFF: That's right.

6 MR. NELSON: Isn't it physically  
7 impossible to lose all hydrogen shielding from  
8 concrete?

9 DR. RESNIKOFF: I don't know the answer to  
10 that question, Counsel. We assumed that there was no  
11 hydrogen. We've looked at the effectiveness of  
12 hydrogen shielding in concrete at various temperatures  
13 up to the 300 degrees Centigrade temperature.

14 MR. NELSON: But is it realistic to assume  
15 that there's absolutely no hydrogen shielding?

16 DR. RESNIKOFF: Our calculations -- I'm  
17 not sure exactly what you mean again by the question.  
18 Do you mean whether the hydrogen has escaped from the  
19 cask or whether it's all been boiled off from the  
20 concrete?

21 MR. NELSON: Well, the practical effect,  
22 the way you had assumed it not to have any shielding  
23 effect, is the same. You assume that it doesn't  
24 reduce neutron dose at all. So the only way that  
25 would occur is if it all boiled off, which is a

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1 physical impossibility, is it not?

2 DR. RESNIKOFF: I can't answer that.

3 MR. NELSON: Do you know whether --

4 DR. RESNIKOFF: I can't answer that. We  
5 assumed that the hydrogen was not present and looked  
6 at the maximum dose that would present itself if that  
7 were true.

8 MR. NELSON: So you don't know if that's  
9 a good assumption or not?

10 DR. RESNIKOFF: I don't know if all the  
11 hydrogen can be boiled off.

12 MR. NELSON: Just one last question on  
13 that: Do you know whether or not the aggregate can  
14 contain hydrogen?

15 DR. RESNIKOFF: What, the cement  
16 aggregate? Is that what you're talking about?

17 MR. NELSON: Yes, the aggregate in the  
18 concrete.

19 DR. RESNIKOFF: Well, I assume it does,  
20 and also the concrete is mixed with water.

21 MR. NELSON: But you assumed that the  
22 aggregate didn't contain any hydrogen either, didn't  
23 you?

24 DR. RESNIKOFF: We have taken standard --  
25 we've gone to standard references and looked at how

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1 much hydrogen would be present in the kind of cement  
2 that PFS is using.

3 MR. NELSON: And you assumed it was all  
4 gone, including the hydrogen in the aggregate,  
5 correct?

6 DR. RESNIKOFF: We've assumed that.

7 MR. NELSON: Would you agree that Mr.  
8 Waters' calculation, which he discussed today,  
9 actually models the thermal effects on concrete, is a  
10 more sophisticated calculation to try to model the  
11 hydrogen loss effects than yours?

12 DR. RESNIKOFF: Which calculation are we  
13 talking about?

14 MR. NELSON: The one in his testimony,  
15 which I believe is State Exhibit 214.

16 DR. RESNIKOFF: Counsel, I need to look at  
17 that.

18 MR. NELSON: Sorry, we're trying to find  
19 a copy here. Well, actually, the State introduced it.  
20 Could you provide him with a copy.

21 MS. CURRAN: Counsel needs to look at a  
22 copy and see if he can find another one because it's  
23 your line of questioning.

24 MR. NELSON: It's your exhibit, Counsel.

25 CHAIRMAN FARRAR: You two weren't talking

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1 to each other then, were you?

2 MR. NELSON: No, Your Honor, that was just  
3 -- I was talking to myself.

4 (Laughter.)

5 CHAIRMAN FARRAR: Thank you.

6 MR. NELSON: Please let me know when  
7 you've had adequate time to review the calculation.

8 (Pause.)

9 DR. RESNIKOFF: I've looked that over,  
10 Counsel.

11 MR. NELSON: All right. Would you agree  
12 that that calculation, in its attempt to model thermal  
13 effects, is more sophisticated than your calculation?

14 DR. RESNIKOFF: This is apples and  
15 oranges. This is a calculation of how much the cask  
16 would heat up. Our calculation was a calculation of  
17 neutrons and the shielding by concrete. We didn't  
18 calculate the temperature rise, which is what this  
19 paper does.

20 MR. NELSON: Correct, but in order to have  
21 hydrogen loss and an increase in neutron dose, you  
22 have to have a temperature increase in the concrete,  
23 isn't that correct?

24 DR. RESNIKOFF: That's correct.

25 MR. NELSON: And so is this another case

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1 where you rely on somebody else or an assumption as  
2 the starting point for your analysis, and then you  
3 say, okay, assume there is absolutely no hydrogen;  
4 what are the effects? Is that accurate?

5 A That's not accurate. This paper estimates  
6 the temperatures up to 264 degrees Centigrade. We've  
7 looked at temperatures that were 0, 100, 200, 300 and  
8 no hydrogen whatsoever. We've looked at all of those.

9 Q So, assuming Mr. Waters' calculation is  
10 the oranges, do you have any basis for disagreeing  
11 with the oranges with Mr. Waters' calculation?

12 MR. TURK: For clarification, are you  
13 referring to State Exhibit 214?

14 MR. NELSON: State Exhibit 214, yes.  
15 Thank you.

16 MR. TURK: I would simply note that Mr.  
17 Waters' testimony has a calculation of the dose  
18 impacts. That's his calculation as opposed to 214.  
19 Just so the record is clear which calculation you're  
20 referring to.

21 MR. NELSON: Certainly. So the record is  
22 clear the two go together. The one is the input to  
23 the other. Is that correct?

24 MR. TURK: Yes.

25 Q So what I was asking you, Dr. Resnikoff,

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1 you were saying they were apples and oranges when I  
2 was referring originally to Mr. Waters' testimony. He  
3 takes the State Exhibit 214 analysis and he comes to  
4 a conclusion regarding neutron doses. What I was  
5 asking is whether or not that entire analysis, the  
6 thermal effect on the concrete and Mr. Waters' use of  
7 that thermal effect on the concrete to estimate  
8 neutron doses was a more sophisticated approach than  
9 the one that you used. Is it more sophisticated or  
10 not?

11 A We didn't calculate the temperatures.  
12 I've already indicated we calculated just for 0  
13 through 300 degrees Centigrade and then all hydrogen.  
14 To make an evaluation of whether his analysis is --  
15 What is the term you used?

16 Q More sophisticated.

17 A More sophisticated. I need to look again  
18 at his analysis.

19 Q Okay. But right now you don't have any  
20 basis with disagreeing with Mr. Waters' testimony  
21 about neutron dose.

22 A I do have bases for disagreeing. But they  
23 don't involve this particular issue that you've  
24 raised. I have bases for disagreeing, yes.

25 Q Okay. Let's go to answer 20 where you

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1 discuss the dose rates that you calculated under a  
2 situation where 80 casks had fallen perpendicular to  
3 the sight boundary with the bottoms of the casks  
4 pointed at the sight boundary. Your calculation is  
5 designed to show if I understand this a worst case  
6 scenario, sort of a what if. You don't assert that  
7 this is a realistic scenario. Do you?

8 A I want to say it's one scenario. There  
9 are many scenarios. This is a scenario which I  
10 thought would provide a conservative estimate of what  
11 the dose would be at the boundary. There are other  
12 scenarios, but they may also be important.

13 Q I was having a hard time picturing this  
14 given that there's two rows of casks on each pad. Can  
15 you describe to me what exactly this situation would  
16 look like, this scenario?

17 A We have the casks lined up so that all of  
18 the bottoms were facing the fence.

19 Q And are they lying on the pad? Are they  
20 off the pad? Where exactly are they?

21 A Some would have to be off the pad, yes.

22 Q Have you done any sort of probability  
23 analysis, ballpark figure to determine the likelihood  
24 of 80 casks falling in this particular manner?

25 A No.

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1 Q You don't know that anybody has tried to  
2 evaluate whether this is realistic or probable or how  
3 probable or improbable. Is that correct?

4 A That's correct. I mean, I was here when  
5 Dr. Singh indicated that it wouldn't be possible. The  
6 casks are going to fall over each other in a random  
7 orientation if casks were to fall. So I did hear his  
8 testimony along that line. But this is what I would  
9 consider a conservative estimate of what the dose  
10 would be.

11 Q As a common sense sort of thing, is this  
12 the kind of thing you would think would happen?

13 A Realistically if the earthquake were high,  
14 the accelerations were great, casks would be  
15 essentially as pick up sticks. They would be oriented  
16 in various directions.

17 Q Randomly. More or less randomly. I mean,  
18 you couldn't predict it ahead of time.

19 A We've simply done a conservative  
20 calculation.

21 Q Now, with respect to the results of the  
22 calculation where you assessed the effect of this, as  
23 I understand in your amended calculation you arrived  
24 at lower radiation dose rates than you had in your  
25 original calculation. Is that correct?

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1           A       There was a range. We had a range. In  
2 some cases, it could be lower. In some cases, it  
3 could be five times higher, not taking into account  
4 this other addition which I mentioned earlier.

5           Q       Perhaps you misunderstood me. I was  
6 referring to the original calculation you did, not to  
7 anybody else's. Compared to the original calculation  
8 you did, you when correcting your error wound up with  
9 lower dose rates. Isn't that correct?

10          A       Are you referring to Exhibit 141-A? Is  
11 that where we are?

12          Q       Yes. In Exhibit 141-A if you compare  
13 those dose rates that you calculated to the dose rates  
14 that you calculated in Exhibit 141 for the same cases,  
15 is it not true that in 141-A when you corrected your  
16 error your dose rates are now lower?

17          A       Yes. That's true.

18          Q       Could you describe what the error was that  
19 -- Actually I guess there were a couple of errors.  
20 Can you describe the error that led to those lower  
21 dose rates? What drove those dose rates down?

22          A       I reviewed Dr. Redmond's testimony. Some  
23 of the points that he raised were correct. So we  
24 revised our calculation to take those into account.

25          Q       So that's how you found those errors?

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1 A That's right.

2 Q Okay. So what were those errors exactly?

3 A They involved thicknesses of the HI-TRAC,  
4 thicknesses of the base plate of the HI-STORM. They  
5 involved changing the closest distance to the fence-  
6 post which we had assumed earlier was 555 meters. The  
7 correct value is 600 meters. There also is a  
8 relationship between a linear surface rate and a dose  
9 to an individual at the boundary. Those are the four  
10 components that we corrected in 141-A.

11 Q Is that last one that you mentioned the  
12 omission of 4 pi from the equation?

13 A Yes.

14 Q With that, how can you be confident that  
15 there are no other errors in your calculation?

16 A Could you repeat that?

17 Q You've amended your calculation based on  
18 errors pointed out by Dr. Redmond. How can you be  
19 confident that you haven't made any other errors in  
20 your calculation that Dr. Redmond might not have  
21 caught?

22 A The way I checked this calculation is I  
23 did the recalculation. Then I handed it to Mr. Lam.  
24 He looked it over. That's the way we did this  
25 particular one.

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1 Q So that's a description of your quality  
2 assurance program, that if one of you does a  
3 calculation, you hand it off to another person, they  
4 look it over and check everything to see if you did it  
5 right.

6 A That was our quality assurance program for  
7 Exhibit 141-A.

8 Q What about the rest of your testimony?  
9 Did you QA the rest of your testimony?

10 A Absolutely.

11 Q Absolutely?

12 A Yes.

13 Q And your exhibits?

14 A Yes.

15 Q So are you confident that now with your  
16 amended testimony that you don't have any errors?

17 A I'm never 100 percent confident, but I'm  
18 pretty confident.

19 Q There was a little hiccup in the QA  
20 process for Exhibit 141 the first time around.

21 A Do you want me to go through how each of  
22 these errors arose?

23 Q No.

24 A Do you want me to do that?

25 Q No. I was just asking you whether Exhibit

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1 141 originally was subjected to your quality assurance  
2 program such as it is.

3 A Yes.

4 Q And again we'll go back. If you missed  
5 that error the first time, how can you be confident  
6 that there aren't other errors in your testimony?

7 A I'm pretty confident.

8 Q Would you take a look at your Exhibit 140?  
9 I'll pass our courtesy copies.

10 (Discussion off the microphones.)

11 Q Do you have your Exhibit 140 in front of  
12 you?

13 A I do.

14 Q Am I correct that one other error slipped  
15 through the QA? That is the note at the bottom that  
16 it should have been changed to two inches of steel  
17 rather than three inches of steel. Is that correct?

18 A Yes. That's correct.

19 MR. NELSON: Okay. Ms. Curran asked if  
20 this was a good breaking point. I have relatively  
21 little left. But this is a change of topic. If we  
22 want to take our afternoon break, this would be a good  
23 time I think for all involved.

24 CHAIRMAN FARRAR: All right. It's almost  
25 3:05 p.m. Let's be back at 3:20 p.m. Off the record.

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1 (Whereupon, the foregoing matter went off  
2 the record at 3:03 p.m. and went back on  
3 the record at 3:22 p.m.)

4 CHAIRMAN FARRAR: On the record. Mr.  
5 Nelson, you had how much more you thought?

6 MR. NELSON: After careful review during  
7 our break I've decided to streamline things. I think  
8 if things go as they've been going probably 15  
9 minutes.

10 CHAIRMAN FARRAR: Good. Go ahead.

11 BY MR. NELSON:

12 Q I'm going to turn to your discussion in  
13 question and answer eight regarding comparison of the  
14 Holtec Certificate of Compliance which I will just  
15 refer to as the COC so I don't have to keep saying  
16 Certificate of Compliance and the PFS site specific  
17 report that was done. My first question as a broad  
18 question is why should it matter whether there are  
19 differences between the Holtec COC and the site  
20 specific report that Holtec did for PFS if PFS is not  
21 relying on a particular portion of the Holtec COC.  
22 Why should that matter?

23 A You're referring to ground motion. Is  
24 that what we're talking about now in answer eight?

25 Q Actually all of them; ground motion,

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1 occupancy, time. There are a couple of others. 33  
2 hour up righting. First of all the question generally  
3 was if PFS has done a site specific analysis that for  
4 those issues that you raised does not depend on the  
5 Holtec COC, why should it matter what the COC says.  
6 Then we can go through each of those point by point.  
7 I'm trying to get a broad understanding of why you  
8 think the Holtec COC is relevant to issues that have  
9 been addressed in site specific report for PFS.

10 A Some of the calculations that were done  
11 for the COC are applicable to the PFS site.

12 Q But if calculations were done for the PFS  
13 site in replacement of, being done independently, why  
14 does it matter what the COC says if the COC is not  
15 being relied upon for that calculation?

16 A I guess I'm talking about there are a  
17 whole bunch of supporting documents for the COC. For  
18 instance, the 33 hours calculation of how much a cask  
19 would heat up in 33 hours. That kind of calculation  
20 is borrowed for the site specific evaluation.

21 Q Are you sure that's borrowed from the site  
22 specific evaluation? Is that referenced in the site  
23 specific evaluation for PFS, the 33 hour calculation?

24 A It's my recollection that it was.

25 Q Let's take something perhaps simpler, the

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1 ground motion. Now, I don't want to ask you about  
2 whether or not you think the analyses were done  
3 correctly. But isn't it true that a calculation for  
4 cask stability was done for the PFS at the site ground  
5 motions? Isn't that true? Do you know?

6 A As far as I understand, I'm not exactly  
7 certain what the answer is. My uncertainty involves  
8 whether we're talking about a 2,000 year return period  
9 or a 10,000 year return period. That's my confusion.

10 Q Can you repeat that last piece of that?  
11 I didn't hear the last sentence.

12 A My confusion is whether it's a 2,000 year  
13 return period or a 10,000 year return period. But  
14 again, those are not issues that I've worked on.

15 Q You've confused me quite a bit because in  
16 answer 8-A you specifically state the calculated  
17 ground motions of the PFS facility for a 2,000 return  
18 period earthquake are 0.711g horizontal and 0.695g  
19 vertical. You cite the SAR. So you do know that  
20 there was a site specific calculation for the PFS  
21 ground motions or have you forgotten.

22 A No, I do know that.

23 Q When I asked you that, you said you did  
24 not know whether a site specific cask stability  
25 analysis had been done. You do know that.

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1 A No. I do know that.

2 Q Okay. That's fine. Then my next question  
3 which led me to asking that question in the first  
4 place was if a cask stability analysis has been done  
5 with the ground motions for the PFS site why should it  
6 matter that those ground motions are different than  
7 the ones in the Holtec COC.

8 A I guess it shouldn't.

9 Q So there is no point to answer 8-A?  
10 You're just saying there's a difference between the  
11 two, and it doesn't have any radiological  
12 consequences.

13 A I think that's right.

14 Q Going on to 8-B. You discuss occupancy  
15 time at the controlled area boundary. Why does it  
16 matter what the difference in occupancy time is for  
17 the calculation for the PFS site specific as opposed  
18 to the Holtec COC?

19 A As I recall, the interim staff guidance  
20 and actually as Judge Kline has pointed out, I hope  
21 I've quoted you correctly, this time period of 8,760  
22 hours per year is for design purposes. So the PFS  
23 using 2,000 hours per year versus the 8,760 hours per  
24 year is perhaps apples and oranges here. One is  
25 referring to 106-B and the other one is referring to

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1 104-A.

2 MR. NELSON: Did you say 106-B? I'm  
3 sorry. Could I have that answer read back?

4 (Playback.)

5 BY MR. NELSON:

6 Q That's fine. So, are you saying that  
7 they're apples and oranges, that it really doesn't  
8 make sense to compare the two, the COC and the site  
9 specific, the different hours, the 8,760 and the  
10 2,000? Is that what you're saying?

11 A I don't understand the question, Counsel.

12 Q You used the term that they are apples and  
13 oranges. Usually when one uses the analogy of apples  
14 and oranges that means things are dissimilar and  
15 should not be compared. I'm asking you whether you  
16 believe that those two hour standards and what I mean  
17 is the 2,000 hours and the 8,760 hours address  
18 different issues, and therefore shouldn't be compared.  
19 Is that your understanding?

20 A It's my present understanding, yes.

21 Q Okay. Moving on to 8-C.

22 A Counsel, I'm not arguing that. It's  
23 possible for someone to be at the fence-post for 8,760  
24 hours per year under 104-A. I'm not arguing that  
25 that's not possible too. I just want that clear.

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1 Q Is it possible or not possible that  
2 somebody could be there 8,760 hours in a year  
3 continuously?

4 A It's possible.

5 Q What's your basis for knowing that it's  
6 physically possible?

7 A That it's an uncontrolled area. It's not  
8 under the jurisdiction of PFS.

9 Q Do you currently know where the nearest  
10 dwelling is to the PFSF site, owner controlled area?

11 A Yes I do. I've visited the site. I've  
12 heard also the testimony of previous witnesses  
13 yesterday. That distance, my recollection, is over  
14 two miles.

15 Q That's my recollection as well. Are you  
16 aware of whether there is any additional buffer zone  
17 around the PFSF site? That is for example, are you  
18 aware whether some of that land may be BLM or some of  
19 that land may be tribal where there could not be a  
20 change in land use? Therefore, there couldn't be  
21 somebody at that boundary. Are you aware of any of  
22 that or anything related to that?

23 A Yes is the answer. I'm aware of that.  
24 Tribal doesn't mean someone could not be there.

25 Q I'm talking about a resident. Do you know

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1           whether or not one could build say a dwelling on BLM  
2           or tribal land abutting the PFSF?

3           A       BLM, you'd have to have clearance just  
4           like BFS is applying for clearance. Tribal land, I  
5           don't know the exact requirements. But this is for  
6           the basis of a conservative estimate. I would say you  
7           should assume a person is there for 8,760 hours a  
8           year. If a person decides to build a house next to  
9           the site, we're not expecting the State to come in  
10          then and ask for a whole review of the license. You  
11          do a conservative analysis to take that into account.

12          Q       Would any such restrictions for example  
13          say that you could hypothetically put a mile exclusion  
14          zone around the PFSF, would that reduce your concerns  
15          about dose consequences?

16          A       If that were hypothetically possible?

17          Q       Yes, if that were hypothetically possible.

18          A       Yes. That would be better. Sure.

19          Q       And that would change your dose estimates  
20          at the boundary even based on what you feel is a  
21          conservative number of 8,760.

22          A       Absolutely. If you expand the controlled  
23          area to a larger area, yes.

24          Q       In terms of the 33 hour time frame that's  
25          been discussed that's been listed in the Holtec COC

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1 relating to blockage of inlets, is it your position  
2 that up righting a cask at the PFSF in 33 hours is a  
3 regulatory requirement for the PFSF? I guess this  
4 would refer to your answer 22. I apologize for not  
5 directing you there to begin with.

6 A If it's part of all the supporting  
7 documents that go into the license application, it's  
8 my understanding that its effectively a part of the  
9 license and the NRC would regulate it that way.

10 Q Your concern over the length of time that  
11 it takes to set a cask upright, does that have to do  
12 with the potential loss of radiation shielding due to  
13 loss of hydrogen as you described in your testimony?

14 A Yes it does.

15 Q Going back briefly to your calculation  
16 regarding the absence of hydrogen. You haven't done  
17 any calculation that shows that there would be  
18 significant health or safety consequences due to a  
19 cask not being placed back upright within 33 hours.  
20 Have you?

21 A This is not a simple question. You have  
22 an earthquake. Are the roads passable? Where are you  
23 getting the shielding? Are they coming down the  
24 highway? Where do you get large cranes to lift up  
25 these casks? Where do you get these so-called air

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1 cushions? How is all this happening? I don't think  
2 that's a simple question, Counsel. It's not 33 hours  
3 that I'm thinking. I'm thinking years to restore the  
4 site to the condition it was before the accident  
5 happened.

6 Q So you're not specifically concerned that  
7 a cask be up righted within 33 hours. You're  
8 concerned about it taking years to rectify something  
9 that happened, seismically induced at the facility.

10 A That's right.

11 MR. NELSON: I think that concludes my  
12 cross. I'd like to move PFS Exhibit 240 to be  
13 admitted into evidence.

14 CHAIRMAN FARRAR: Any objection?

15 MS. CURRAN: No objection.

16 CHAIRMAN FARRAR: Staff.

17 MR. TURK: No objection.

18 CHAIRMAN FARRAR: All right. Exhibit 240  
19 will be admitted.

20 (The document referred to having  
21 previously been marked for identification  
22 as PFS's Exhibit No. 240, was received  
23 into evidence.)

24 MR. NELSON: I think for the record I did  
25 make my 15 minutes with a little margin.

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1 CHAIRMAN FARRAR: Good job. Mr. Turk, do  
2 you have a new estimate of the time you'll need?

3 MR. TURK: Your Honor, I do not want to  
4 prolong this beyond the close of today's session.  
5 It's now about 3:40 p.m. We're here for another hour  
6 and 20 minutes. I will do it in that time. Perhaps  
7 even less.

8 CHAIRMAN FARRAR: Okay. Go for it.  
9 That's much better than the last projection.

10 (Laughter.)

11 MR. TURK: I sense a little disbelief. No  
12 comment. Let me note also we're dealing with a short  
13 piece of testimony. It's only 13 pages. However, my  
14 cross examination plan goes into many of the same  
15 areas that PFS raised.

16 CHAIRMAN FARRAR: Okay.

17 MR. TURK: I will eliminate duplicate  
18 questions. I will be going into the same areas  
19 because that's the scope of the direct testimony and  
20 that's what I need to examine in cross.

21 CHAIRMAN FARRAR: Okay.

22 MR. TURK: So if it sounds like I'm  
23 starting to get duplicative please tell me. I would  
24 ask Counsel for the State to be aware the areas are  
25 pretty much the same but I'll truncate so that I don't

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1 duplicate if I can avoid it.

2 CROSS EXAMINATION

3 BY MR. TURK:

4 Q Good afternoon, Dr. Resnikoff.

5 A Good afternoon, Mr. Turk. We've met  
6 before.

7 Q We have. It's nice to see you again.  
8 Just by way of clarification, your resume indicates  
9 that you have a Ph.D. in Physics.

10 A That's correct.

11 Q You're not a structural engineer.

12 A That's correct.

13 Q Nor a mechanical engineer, nor a nuclear  
14 engineer, nor a civil engineer. Correct?

15 A That's all correct.

16 Q You're not a licensed engineer or a  
17 professional engineer in any state within the country.

18 A That's correct.

19 Q You have never conducted a Monte Carlo  
20 Analysis. Is that correct?

21 A That's correct.

22 Q You would agree that Monte Carlo is a  
23 technique that's often employed in estimating direct  
24 radiation doses from neutron and gamma.

25 A Yes. There are other techniques, but I

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1 would consider it the preferred technique.

2 Q Have you ever had occasion to calculate  
3 direct radiation doses as opposed to doses due to the  
4 release of radiological materials?

5 A Yes.

6 Q Prior to this proceeding?

7 A Excuse me. I didn't hear you.

8 Q Prior to your involvement in this  
9 proceeding?

10 A Yes.

11 Q Where was that?

12 A This involved several law cases that we've  
13 been involved in. For instance, right at this moment  
14 we're working on a case involving oil pipe cleaners in  
15 Louisiana where there's radioactive scale on the  
16 inside of a pipe. We have to estimate radiation  
17 exposures that drivers get and that workers get in the  
18 field. We look at direct gamma. We look at material  
19 that is deposited on the ground and direct gamma doses  
20 due to that material. We also investigate inhalation  
21 exposures, but that's not the question you're asking.

22 Q Have you ever had occasion to evaluate  
23 direct radiation doses where there is substantial  
24 shielding involved between the source of the radiation  
25 and the person who is exposed?

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1 A Substantial what did you say?

2 Q Shielding.

3 A Yes. This example I just mentioned where  
4 you have a row of pipes and you have to take into  
5 account the fact that the pipes other than the first  
6 pipe are shielded by the first pipe.

7 Q You're dealing there with oil drilling  
8 pipes.

9 A Yes. That's right.

10 Q These are hollow tube pipe assemblies.

11 A I didn't hear you again.

12 Q These are hollow tubes.

13 A Yes. That's right. They are.

14 Q Spent Nuclear Field is not involved in  
15 those analyses. Are they?

16 A No.

17 Q Are the pipes involved in your analysis  
18 filled with concrete?

19 A No.

20 Q So the shielding is essentially the  
21 shielding provided by the thin wall construction of  
22 the pipe.

23 A Yes.

24 Q There we're talking on the order of less  
25 than an quarter-inch of steel probably.

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1 A Generally, yes.

2 Q Is it correct that as neutron and gamma  
3 radiation enters into shielding material and then  
4 exits from the other side the radiation behaves in  
5 certain manners unique to direct radiation  
6 calculations that you don't find in doing radiological  
7 release calculations?

8 A That's correct.

9 Q That's one reason why Monte Carlo is often  
10 used, because it's able to calculate the behavior of  
11 the radiation as it moves through the shielding  
12 material.

13 A Yes. That's one of the underestimates  
14 that we didn't use this neutron to gamma effect in our  
15 calculation in Exhibit 141-A. This one needed a Monte  
16 Carlo analysis to do that.

17 Q Could you explain why you believe that  
18 Monte Carlo is the preferred technique?

19 A Because you have these geometries that are  
20 difficult to model other than tracing rays and summing  
21 them all up.

22 Q In effect, the neutron and gamma scatters  
23 as it moves through the tubing. Is that correct?

24 A That's also true.

25 Q So in effect, you have to calculate the

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1 net dose that results after that scatter behavior or  
2 absorption of the particles by the shielding material.

3 A That's true.

4 Q You didn't do that in your calculations.

5 A We did not. We did not do that.

6 Q Okay. Have you ever had experience in  
7 calculating direct radiation doses in which long  
8 distances such as 600 meters are involved prior to  
9 this proceeding?

10 A I don't think so. Not to the best of my  
11 recollection.

12 Q In answer number 2 of your testimony, you  
13 indicate that you are designated to serve as a State  
14 witness with respect to a portion of intention Utah L  
15 Part B which is now part of Utah L/QQ. The portion of  
16 the contention for which you are designated as an  
17 expert involved that section of the contention dealing  
18 with 10 CFR Section 72.104-A. Correct?

19 A That's my understanding of the origin of  
20 this contention.

21 Q Were you involved in the drafting of the  
22 contention?

23 A You know, I can't recall. This has been  
24 over five years ago. I can't recall. I don't believe  
25 so, but I can't recall. Certainly not the original.

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1 Q In various places in your testimony, you  
2 refer to on-site worker doses.

3 A Yes.

4 Q I'll read a list of answers rather than go  
5 through it one by one. In answers 3, 18, 19, 22, 23,  
6 and 27 I see references to on-site worker doses.  
7 Could you identify any place in the contention that  
8 the issue of on-site worker doses is presented? Do  
9 you have the contention there?

10 A I've read the contention. I don't have it  
11 in front of me.

12 MR. TURK: I would ask the Counsel for the  
13 State to provide a copy of State Exhibit 237 or I'll  
14 share mine with the witness.

15 MS. CURRAN: If you wouldn't --

16 MR. TRAVIESO-DIAZ: It's PFS Exhibit 237.

17 MR. TURK: I'm sorry. PFS Exhibit 237.

18 MS. CURRAN: If you wouldn't mind if you  
19 have a copy you can provide.

20 MR. TURK: I have my own copy.

21 MR. TRAVIESO-DIAZ: We'd be happy to give  
22 our copy. I think we know it by heart.

23 MR. TURK: I'll read the section of the  
24 contention which I believe Dr. Resnikoff indicated  
25 he's responsible for, testifying with respect to.

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1 BY MR. TURK:

2 Q Dr. Resnikoff, perhaps you can tell me if  
3 I'm correct that this is the section that you were  
4 retained to serve as an expert in this proceeding.

5 A Thank you.

6 MR. TURK: This sentence reads and this is  
7 subsection 2 of Part E of the contention. It reads  
8 "PFS has failed to show that its facility design will  
9 provide adequate protection against exceeding the  
10 Section 72.104-A dose limits." Is that the portion of  
11 the contention for which you were retained to serve as  
12 an expert witness?

13 DR. RESNIKOFF: Yes.

14 MR. TURK: And when I look at 10 CFR  
15 72.104(a) I read the standard as stating "During  
16 normal operations and anticipated occurrences, the  
17 annual dose equivalent to any real individual who is  
18 located beyond the controlled area boundary must not  
19 exceed 0.25 millisieverts (25 milligrams) to the whole  
20 body, 0.75 millisieverts (75 milligrams) to the  
21 thyroid and 0.25 millisieverts (25 milligrams) to any  
22 other critical organ as a result of any exposure to  
23 either" and here I'm going to paraphrase plan  
24 discharges of radioactive materials, etc. or direct  
25 radiation from the esphice (PH) and any other

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1 radiation from the uranium fuel cycle operations  
2 within the region. Are you aware of anything in that  
3 section of the regulation that addresses worker doses  
4 at the site of the facility?

5 DR. RESNIKOFF: Can I ask you a question?  
6 Are we talking about earthquakes now or are we talking  
7 about general calculation of doses? I would just like  
8 to know as to how to answer this question better.

9 MR. TURK: We are talking about that  
10 regulation which specifically addresses doses to any  
11 real individual located beyond the owner controlled  
12 area boundary.

13 DR. RESNIKOFF: That regulation applies to  
14 non-accident conditions.

15 MR. TURK: Does it apply to workers at the  
16 site?

17 DR. RESNIKOFF: No.

18 MR. TURK: Your Honor, as I've made  
19 reference to various answers in the testimony in which  
20 the issue of doses to workers is raised I would move  
21 to strike that portion of the testimony as beyond the  
22 scope of the contention and as not being something  
23 raised by the regulation which the State put at issue  
24 in that section of the contention.

25 MS. CHANCELLOR: With permission I don't

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1 want to tag team but there's a long history to this  
2 contention.

3 MR. TRAVIESO-DIAZ: Ms. Chancellor, as I  
4 was sitting here writing my notes, I am reminded of  
5 the fact that we are going to have a tag team we have  
6 to go like in wrestling. We have to have four per  
7 side. You probably don't want that, do you?

8 MS. CHANCELLOR: I'm quite happy for Mr.  
9 Gaukler to present. He's presided over a lot of  
10 squabbles amongst us.

11 MR. TRAVIESO-DIAZ: I was subjecting  
12 myself.

13 MS. CHANCELLOR: I think there are a  
14 number of issues that go into the mix of this. This  
15 is a historical contention which we tried to negotiate  
16 or rewrite with the staff and they refused to do so.  
17 It has its genesis in the 1998 rule making plan  
18 whereby an applicant could rely on 104(a) and obtain  
19 a 1,000 year return period earthquake.

20 Otherwise the applicant had to abide by  
21 the 104(b) analysis and the 10,000 year design basis  
22 earthquake. That was the rule making plan 106(b)  
23 statement. That was the genesis of this contention.  
24 That issue went up to the commission and came back  
25 down again. The commission ruled that the state

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1 could in part rely on that rule making plan but not  
2 entirely.

3 In addition PFS and staff have the burden  
4 to demonstrate under 72.7 that they are entitled to an  
5 exemption from the requirements of the regulations as  
6 the commission determines, are authorized by law and  
7 will not endanger life or property or the common  
8 defense and security in otherwise in the public  
9 interest. So there is a health and safety requirement  
10 in 72.7. That's the burden that PFS must meet.

11 So I think with respect to Dr. Resnikoff's  
12 testimony that it goes to the genesis of the  
13 contention which was the rule making plan that was in  
14 effect at the time that the State filed its  
15 contention, at the time PFS submitted its exemption  
16 request and during the bulk of the time that the staff  
17 conducted its review of PFS's exemption request.

18 On that basis, Your Honor, I think that I  
19 disagree with Mr. Turk's request to strike the  
20 testimony and in this proceeding you have begin very  
21 parsimonious with striking any testimony. I urge you  
22 to continue in your parsimony.

23 CHAIRMAN FARRAR: But 104 and 106 do not  
24 seem to have reference to occupation matters.

25 MS. CHANCELLOR: That's 72.7 is written in

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1 very general terms, Your Honor.

2 CHAIRMAN FARRAR: Right but to the extent  
3 -- Go ahead Mr. Gaukler.

4 MR. GAUKLER: I would just like to point  
5 out that you are exactly correct that 72.104 does not  
6 refer to workers' doses. Section 20 addresses that.  
7 Moreover in the contention itself, there never was any  
8 reference to doses of workers in terms of the issues  
9 that they raised were specifically the 72.104(a) issue  
10 in the context of the SECY as it existed at that point  
11 in time. So I do think this is beyond the scope of  
12 the contention and particularly rephrased by the Board  
13 when it admitted the contention. Having said that I  
14 hesitate to get in to it too deeply.

15 CHAIRMAN FARRAR: Let's talk about two  
16 things. I wasn't here when the contention was  
17 admitted the first time. Was occupational referred to  
18 there? We are dealing with two things. We have the  
19 contention as Judge Bulwark's Board admitted it. Then  
20 we had later contentions admitted and the joined  
21 stipulated contention intended to merge any of them.  
22 Who can help me with where in any of those there was  
23 occupational?

24 MR. TURK: Your Honor, there was no  
25 occupational issue raised. I would point out that

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1           neither we nor the Applicant has included a discussion  
2           in our testimony occupational doses for the simple  
3           reason that the issue was not fairly joined. It is  
4           not part of the contention and it never was. It is  
5           simply thrown into the testimony by Dr. Resnikoff  
6           without regard to the precise scope of the contention.

7                     For that reason I think it would be unfair  
8           to have any testimony by the State on worker doses  
9           when it was neither admitted as an issue nor addresses  
10          by either of the parties. I think it's a simple  
11          fairness to stay within the scope of the issues that  
12          the State itself identified.

13                    CHAIRMAN FARRAR:           The stipulated  
14          contention does mention 104(a) a couple of times.

15                    MR. GAUKLER:   Excuse me. I missed what  
16          the question was, Your Honor.

17                    CHAIRMAN FARRAR:   What?

18                    MR. GAUKLER:   Do you have a question?

19                    CHAIRMAN FARRAR:   No I was just muttering.

20                    MR. GAUKLER:   I was distracted. My  
21          understanding is that (1) worker doses were not in the  
22          original contention as filed by the State. (2) When  
23          the contention was admitted, Judge Bulwark took what  
24          he understood to be the issues raised by the Board and  
25          a contention came up with what is now Section E of the

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1 Unified Contention.

2 Having said all that I hate to get  
3 distracted at this point in time on something which is  
4 really a legal issue. Maybe we could quickly go ahead  
5 and have it and just leave the parties to brief this  
6 in their findings of fact.

7 CHAIRMAN FARRAR: But Mr. Turk will say if  
8 we don't strike he has to bring on a parade of  
9 witnesses to deal occupational.

10 MR. TURK: Your Honor, that's not my  
11 intention but that would be proper resolution if you  
12 ruled that we now have to address this issue. We  
13 would have to go back into hearings on workers doses  
14 having never understood that to be the issue before.

15 There is another simple fix, Your Honor,  
16 if we all agree that we're not going to address  
17 findings or proposed findings to workers doses then it  
18 doesn't have to stricken. It just simply won't be  
19 used in our proposed findings.

20 CHAIRMAN FARRAR: I'll hear you in a  
21 minute on it.

22 (Judges conferring.)

23 CHAIRMAN FARRAR: Ms. Chancellor, can you  
24 respond to Mr. Turk's suggestion?

25 MS. CHANCELLOR: Your Honor, with respect

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1 to worker doses that goes to how long it's going to  
2 take to get back to normal conditions. Because the  
3 amount of time that workers can be at the site to take  
4 care of shielding and other matters has an effect on  
5 the duration of the accident and when you get back to  
6 normal conditions.

7 So we would not be willing to agree to  
8 completely eliminate any discussion of doses to  
9 workers as it relates to the duration of the accident  
10 period under 106(b) the actual event.

11 MR. TRAVIESO-DIAZ: Could I make an  
12 observation? My reading of Dr. Resnikoff's testimony  
13 leads me to believe that any reference he makes to  
14 worker doses is conjecture in nature. He has no  
15 source to estimate the doses that the workers would be  
16 exposed to. Therefore on the one hand I don't think  
17 there is anything really to strike because he has  
18 provided no facts.

19 For example in answer 27 where he talks  
20 about worker doses he is only saying what PFS should  
21 do. Having said that I don't believe that Ms.  
22 Chancellor can argue based on this testimony and  
23 anybody else's on the record that there is a basis for  
24 tying workers doses to the length of accident. There  
25 is simply no evidence offered by anybody including the

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1 State that links worker doses to radiation accidents.  
2 My view is that clearly there isn't anything on the  
3 record that could help us with worker doses including  
4 the testimony of Dr. Resnikoff.

5 MS. CHANCELLOR: I could see whether it  
6 could help us or not. There is no need to make that  
7 conclusion here.

8 MR. TRAVIESO-DIAZ: We have a motion to  
9 strike. We're trying to resolve it, granting it or  
10 denying it. I'm trying to suggest a solution.

11 MS. CHANCELLOR: And what's the solution?

12 MR. TURK: I could stipulate to --

13 MS. CHANCELLOR: Well that's dangerous.

14 (Judges conferring.)

15 CHAIRMAN FARRAR: Let me ask a few  
16 questions of counsel about Part 20 given Ms  
17 Chancellor's concern about the cleaning up after a  
18 hypothetical accident. If I recall correctly because  
19 it's been a long time, Part 20 deals with routine  
20 occupational exposure. Does it have any exemptions in  
21 case of necessity in post accident situations?

22 MS. CURRAN: I don't know if it's in Part  
23 20 but the EPA Protective Action Guidelines.

24 MR. TURK: Your Honor, without looking at  
25 specific provisions of Part 20, there is an

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1 understanding. I believe it's expressed in the  
2 regulations that where necessity requests it there is  
3 a possibility for an accident to exceed the fiber and  
4 dose for workers in order to protect life and  
5 property. Without looking at the regulations  
6 specifically, I think that's it.

7 CHAIRMAN FARRAR: Yes.

8 MR. TURK: I'm going to be prepared to  
9 give you the details of that.

10 MS. CURRAN: I also remember that there's  
11 a requirement that you alert people that they are  
12 going to be exposed. It all has to be planned in  
13 advance. Then there's a limit to that. So that even  
14 in an accident there's a limit to what you can do and  
15 you have to tell people in advance. Workers, you have  
16 to tell them in advance.

17 MR. TURK: The essential point, Your  
18 Honor, is this contention involves the question of  
19 what's the proper design basis earthquake for the  
20 facility. The State alleged that initially you had to  
21 meet the 72.104(a) criterion which is the off-site  
22 doses criterion not a worker dose criterion. And we  
23 have never moved from that definition of what's the  
24 issue in the case.

25 Now if the State had raised an issue about

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1 worker doses we all would have addressed it. As Ms.  
2 Chancellor noted before under the exemption standard  
3 there may be a range of issues that you would  
4 consider. But in the proceeding we have to consider  
5 the specific contention raised by the intervener.  
6 Beyond that the staff would consider issues not raised  
7 fairly in the proceeding.

8 CHAIRMAN FARRAR: You are suggesting that  
9 the exemption regulation is written broadly enough  
10 that it could embrace a worker issue if that were  
11 properly raised.

12 MR. TURK: Yes.

13 CHAIRMAN FARRAR: Then when the company  
14 applied for the exemption, was the worker dose  
15 protection standard something the staff required the  
16 Applicant to demonstrate as part of its exemption  
17 request? Do you recall?

18 MR. TURK: My understanding of the process  
19 is that the application was submitted initially.  
20 There was provision there with respect to worker doses  
21 under the Radiation Protection Program. When the  
22 exemption came in, that merely established the request  
23 to establish a design basis accident at a certain  
24 level which would then be covered by the same  
25 Radiation Protection Program that would apply to other

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1 design basis accidents.

2 CHAIRMAN FARRAR: Mr. Travieso-Diaz, what  
3 was your suggestion?

4 MR. TRAVIESO-DIAZ: My suggestion was that  
5 in fact what could be done is treat Dr. Resnikoff's  
6 testimony with respect to worker exemptions as not  
7 being a statement of fact from which findings could be  
8 written. For example I was referring to 27 being  
9 clearly conclusive and if we do that I think the State  
10 may argue whatever it wants with respect to the  
11 applicability of these various sections but we will  
12 have to deal with having proposed findings of fact  
13 tendered by the State to which you now have  
14 corresponding testimony that we can cite to report it.

15 The point that Mr. Turk raised which is  
16 one I think of fairness is the fact that we have no  
17 idea that this contention would include or should  
18 include worker doses. And that's how it is. There is  
19 no testimony other than Dr. Resnikoff's.

20 CHAIRMAN FARRAR: Mr. Turk, go through  
21 that litany of numbered questions that you said  
22 referred to occupational doses. What was the first  
23 one?

24 MR. TURK: Your Honor, I am going to have  
25 to do a find and replace command in Word Perfect to

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1 make sure I have captured them all.

2 CHAIRMAN FARRAR: You asked him a  
3 question.

4 MR. TURK: The specific answer is in his  
5 testimony.

6 CHAIRMAN FARRAR: Yes.

7 MR. TURK: But the ones that I have noted  
8 are his answers number 3.

9 CHAIRMAN FARRAR: Hold on.

10 MR. TURK: There may be more.

11 CHAIRMAN FARRAR: I just want the ones you  
12 noted. Okay, go ahead.

13 MR. TURK: Eighteen. The word on the  
14 third line of the paragraph beginning "Second."

15 CHAIRMAN FARRAR: Okay.

16 MR. TURK: Nineteen. The fourth line in  
17 the first paragraph.

18 CHAIRMAN FARRAR: Okay.

19 MR. TURK: Twenty-two. Towards the end of  
20 the paragraph, the next to the last line in the  
21 paragraph.

22 CHAIRMAN FARRAR: All right.

23 MR. TURK: Twenty-three. The last line of  
24 the first paragraph. Again in subpart A the next to  
25 the last line of that paragraph. In subpart B the

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1 seventh line and the ninth line and the tenth line.

2 MR. GAUKLER: Your Honor, I do want to  
3 make one small correction. We did refer to work dose  
4 in our testimony of Dr. Redmond, Dr. Singh and Dr.  
5 Soler but primarily just to respond. That wasn't  
6 relevant here. You'll see that in question 55 of the  
7 testimony. But they basically made the point that it  
8 wasn't a relevant consideration.

9 MR. TRAVIESO-DIAZ: So to that extent, I  
10 misspoke but these corrections --

11 MR. TURK: And answer 27 has one more  
12 reference. The last line.

13 CHAIRMAN FARRAR: Ms. Chancellor, most of  
14 those references to which Mr. Turk just directed our  
15 attention are not very specific. They are just saying  
16 that the company didn't consider workers which I guess  
17 they can see now that they didn't consider them in  
18 their testimony that they presented here.

19 MR. GAUKLER: What did you say, Your  
20 Honor?

21 CHAIRMAN FARRAR: That you didn't consider  
22 the dose to the workers in the testimony you  
23 presented.

24 MR. GAUKLER: We just addressed it in the  
25 context that it wasn't relevant to the contention to

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1 issues raised with respect to this contention here.  
2 That's how we addressed it. I think as we pointed out  
3 in our testimony here as referred to yesterday in the  
4 testimony on the stand by our witnesses there is a  
5 host of other provisions from which you pick to  
6 protect workers from radiation during the working  
7 process and that raises a whole host of issues that go  
8 beyond the scope of the contention as was submitted.

9 MS. CHANCELLOR: Your Honor, the State  
10 would be willing to use the dose to workers for  
11 purposes of arguing what is the duration of the  
12 accident rather than whether there's actually a  
13 violation of part 20 or --

14 Now let me back up. We would be willing  
15 to abide by any ruling of the Board. If we are  
16 committed to use the effect of doses to on-site  
17 workers as it relates to the actual duration of the  
18 event. I think that's what's at issue here. Under  
19 what we've been arguing about, a real individual under  
20 104(a) and any individual under 106(b) and talking  
21 about what is the duration of the event, being the  
22 accident under 106(b). That seems to be the heart of  
23 the issue with respect to this part of the contention.

24 MR. TRAVIESO-DIAZ: With all due respect  
25 the entire testimony that was proffered by this

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1 witness and that he was examined on that with the  
2 proposition that 104(a) was applicable standard we  
3 never addressed and he didn't address 106(b) the  
4 applicable standard and any questions how long the  
5 accident is. This hasn't been used. It would  
6 unacceptable to let him argue that at this point to  
7 try to stipulate the relation of the accident.

8 MR. TURK: I would be happy with a  
9 different outcome. I think it would be fair to all  
10 parties and I think the Board might find it appealing.  
11 We could indicate in our findings that Dr. Resnikoff  
12 referred to the possible increase in doses to workers  
13 however the issue was not directly addressed in the  
14 contention and therefore is not subject to a decision  
15 in the proceeding.

16 MS. CHANCELLOR: Well what about the issue  
17 of compliance with occupational dose limits. I assume  
18 that we could always argue that.

19 MR. GAUKLER: It's not part of the  
20 contention.

21 MR. TURK: It's June 25. We're getting to  
22 the end.

23 MS. CURRAN: Sherwin, I think Denise  
24 misunderstood what I said. I suggested something to  
25 her. Instead of playing telephone, maybe I should say

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1 it directly. If we could stipulate that there will be  
2 no findings on compliance of PFS with occupational  
3 dose limits. That wasn't the purpose of this  
4 testimony.

5 MR. GAUKLER: I would. I read the  
6 testimony. And to the extent that they're trying to  
7 get into the duration of the accident through worker  
8 doses, I would object for the same reason that Mr.  
9 Travieso-Diaz just stated.

10 (Judges conferring.)

11 CHAIRMAN FARRAR: We're going to deny the  
12 staff's motion to strike but rule in favor of the  
13 other alternative suggested. Ms. Chancellor, given  
14 the way the contention was framed and the way this  
15 arose we don't see ourselves deciding this case on the  
16 basis of worker doses. I think it's too late in the  
17 game.

18 As liberal as we have been in saying that  
19 the contentions can be reshaped by events that  
20 happened during discovery and so forth, this seems to  
21 be beyond the bounds. If we let this in I think we  
22 have to reopen the hearing and deal with it. I'll let  
23 the other parties deal with it. We're not about to do  
24 that.

25 So I can't remember if it was Mr. Turk's

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1 or Mr. Travieso-Diaz's suggestion not to strike the  
2 material but what was the issue?

3 MR. TURK: Don't cite in our proposed  
4 findings or ask for a court decision on it.

5 CHAIRMAN FARRAR: We're also motivated by  
6 the fact that Dr. Resnikoff's testimony doesn't raise  
7 anything specific that says here is what would happen  
8 to the workers. It's just an allegation that there is  
9 no evidence by PFS put into the case. They haven't  
10 done the calculations and the reason that they haven't  
11 is that it was not fairly raised. So I think that's  
12 where we are.

13 MS. CURRAN: Judge Farrer?

14 CHAIRMAN FARRAR: Yes.

15 MS. CURRAN: I just want to ask for  
16 clarification. I think one of the issues that has  
17 come up in this hearing and we've talked about this  
18 before the duration of the accident. We would like to  
19 at least discuss in general terms that there are  
20 various factors that go into looking at what that  
21 might be.

22 We have not come and said this is the  
23 duration but we certainly would like to be able to  
24 testify here about the factors that would go into that  
25 determination. In our view one of them would be the

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1 situation that workers would find themselves in  
2 restoring the site after an accident. I would just  
3 like to clarify whether we'll be permitted to talk  
4 about that issue in general terms.

5 CHAIRMAN FARRAR: To talk about it through  
6 whom?

7 MS. CURRAN: Through Dr. Resnikoff.

8 CHAIRMAN FARRAR: On redirect you mean?

9 MS. CURRAN: Or on rebuttal.

10 CHAIRMAN FARRAR: On rebuttal.

11 MR. TRAVIESO-DIAZ: Mr. Chairman, we're  
12 introducing here again a moving target. I do think  
13 that if they want --

14 CHAIRMAN FARRAR: Careful.

15 MR. TRAVIESO-DIAZ: I know there's another  
16 word but I haven't used them before so I think it can  
17 come out just once. If they do want to report this in  
18 their (Inaudible.) or to have a totally new  
19 essentially direct testimony by Dr. Resnikoff on an  
20 issue that nobody has addressed before on June 25 at  
21 5:00 p.m. to me is both impractical and really pretty  
22 unfair to everybody. How are we going to respond to  
23 it overnight?

24 Quite frankly what happened here is that  
25 their argument for 104(a) controls is shot and they

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1 are trying to resurrect their case by saying that  
2 106(b) controls but the length of the accident could  
3 be five, ten, twenty years. I think that's just a new  
4 claim now. That's really what's going on right here  
5 and I think it's unacceptable.

6 MS. CURRAN: We have testimony from Dr.  
7 Resnikoff that the duration of the accident is a year.  
8 We have testimony from the other parties that the  
9 duration of the accident is shorter. And we would  
10 like to be able to respond to what the other side  
11 said.

12 JUDGE KLINE: Would you explain how you  
13 think consideration of occupational doses would assist  
14 your case in that argument? It's plain from Part 20  
15 that worker dose is five REM. It's already  
16 established that the Part 72.104 dose of relevance is  
17 25 milliREM. Dr. Resnikoff has not alleged anything  
18 approaching five REM in anything especially an  
19 accumulative dose over a year.

20 So it isn't clear why that would assist  
21 your case even if we permit it aside from all of the  
22 facts that it would open up a whole new area of  
23 controversy. Can't you get where you want to get with  
24 the unrestricted doses? I mean if it's there to be  
25 gotten.

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1 MS. CURRAN: I really feel that that's a  
2 question that would appropriate to ask Dr. Resnikoff.  
3 I would testifying I think.

4 CHAIRMAN FARRAR: You can argue that.

5 MS. CURRAN: He could give a more complete  
6 answer than I could.

7 MR. TURK: I would suggest that we leave  
8 until tomorrow whatever they want to introduce then  
9 and then we can argue whether it's appropriate  
10 considering that I committed to a 5:00 p.m. closing  
11 time and it's now 4:30 p.m. I've eaten up a half hour  
12 of my time.

13 CHAIRMAN FARRAR: Let's move on and on the  
14 basis that we've indicated. Go ahead, Mr. Turk.

15 MR. TURK: Thank you, Your Honor.

16 RECROSS EXAMINATION (con'd)

17 BY MR. TURK:

18 Q I'd like to come to the discussion of the  
19 ALTRAN report, Dr. Resnikoff. If you would turn to  
20 answer 24, your first sentence in answer 24 states  
21 affirmatively that the ALTRAN report, State Exhibit  
22 122, concludes that the HI-STORM 100 casks will tip  
23 over under peak ground accelerations induced by 2,000  
24 year earthquake at the PFS facility. I read that  
25 correctly.

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1 A Yes.

2 Q Is that your view of what the ALTRAN  
3 report actually states?

4 A That is my understanding as a result of  
5 the phone conversations that we had.

6 Q It's not based on your reading of the  
7 ALTRAN report?

8 A I think I'd have to go back and look at  
9 the report.

10 Q Dr. Resnikoff, this is your sworn  
11 testimony in proceeding. Correct? You have adopted  
12 this written statement as your sworn testimony in the  
13 proceeding. That's correct, yes?

14 A Yes.

15 Q Do you have the ALTRAN report with you?

16 A I don't have it with me.

17 MR. TURK: Could I share my copy with your  
18 witness or, Ms. Chancellor, do you have a copy to  
19 provide him?

20 MS. CHANCELLOR: No, we didn't bring our  
21 Section D.

22 MR. GAUKLER: I have a copy, Your Honor.

23 MS. CHANCELLOR: Thanks.

24 MR. TURK: I'd like you to look at this  
25 report.

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1 MR. GAUKLER: Just for the record, I'm  
2 showing him the report dated December 11, 2001. It's  
3 not marked as an exhibit in this proceeding but I'm  
4 showing it.

5 MR. TURK: It's State Exhibit 122. I  
6 would like me to point me to the sentence or the  
7 discussion in this report that makes the statement  
8 that you adopt as your sworn testimony in answer 24.

9 MS. CHANCELLOR: Could you also give Dr.  
10 Resnikoff a copy of --

11 MS. CURRAN: Mr. Turk, do you also have a  
12 copy of the Con and Ostadan testimony that you could  
13 give him?

14 MR. TURK: I have it.

15 MS. CURRAN: Well, that's what he's  
16 stating here. It's referred to in his footnote as to  
17 the testimony of Drs. Con and Ostaden.

18 THE WITNESS: In table 3, you will see  
19 study run number one. It shows horizontal  
20 displacement 373 inches in the X direction and in the  
21 Y direction of 230 inches. That's where it comes  
22 from.

23 BY MR. TURK:

24 Q So it's based upon that table. Could you  
25 turn also if you would to the last page of report,

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1 page 20? Incidentally before doing that, do you  
2 notice that there are certain assumptions stated in  
3 the table such as a coefficient of friction of 0.01  
4 percent?

5 A Yes that's right.

6 Q And it's for that case that you are saying  
7 that casks will tip over. If you would turn to page  
8 20?

9 MS. CURRAN: Would you let the witness  
10 answer the question?

11 MR. TURK: Yes.

12 THE WITNESS: Well, if the coefficient of  
13 friction is low that will allow the cask to slide. If  
14 the coefficient of friction is high then the casks are  
15 more likely to tip.

16 BY MR. TURK:

17 Q Is there anything in that table that  
18 indicates that a cask would tip over as opposed to  
19 slide?

20 A No this table is about displacements in  
21 the X and Y directions. It also mentions the  
22 displacement in the Z direction of 27 inches uplifted  
23 and that's where we got the number 27 inches.

24 Q So you would agree that this table does  
25 not support your statement that in the event of a

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1 2,000 year return period input motion the casks will  
2 tip over.

3 A This table?

4 Q Yes.

5 A This table doesn't.

6 Q If you would let me cut it short go to  
7 page 20. I would ask you to read with me the very  
8 last bullet that appears before the reference section.  
9 Is it not correct that the conclusion of this report  
10 is as follows: "It is possible that for high level  
11 ground input motion the HI-STORM 100 cask could  
12 overturn, i.e. tip over."?

13 A I see that.

14 Q That's the conclusion of the report not  
15 that the cask will tip over but it's possible that  
16 they could tip over for some high level ground input  
17 motion. Correct?

18 A Yes.

19 Q Would you agree then that your statement  
20 in answer 24 is a little bit too strong?

21 A I guess will should be may.

22 Q Now is it your testimony where you use the  
23 word will change it to may?

24 A It's more appropriate to make it in line  
25 with the conclusion of the ALTRAN report.

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1 Q We have had some questions by the State of  
2 our witness and I believe of the PFS witness as to  
3 whether they are aware of land use plans for Tuella  
4 County (PH). Do you recall there was some questioning  
5 along that line?

6 A I do.

7 Q Do you consider yourself an expert in the  
8 land use plans for Skull Valley?

9 A An expert on land use plan, no.

10 Q Have you seen any land use plans that call  
11 for dramatic increase in population in Skull Valley  
12 close to the PFS facility?

13 A I have not.

14 Q Are you aware that in the SAR section that  
15 Mr. Waters referred there's an assessment that only 36  
16 individuals live within a five mile radius of the PFS  
17 facility?

18 A I recall that answer, yes.

19 Q Are you aware of any information that  
20 would state or would lead you to conclude that that's  
21 an inaccurate assessment?

22 A No.

23 Q Are you aware of any information that  
24 would lead to conclude that the SAR description of the  
25 nearest residents to the PFS site is incorrect?

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1 A No.

2 Q I would ask you to turn to State Exhibit  
3 136. Do you have that with you?

4 A Which is that, Counsel?

5 Q This is a commitment letter by PFS dated  
6 September 25, 2001, Exhibit 136.

7 MR. TURK: I'm at Item 24 on the Cross  
8 Examination plans, Your Honor. Actually Item 23.  
9 Have you seen this commitment letter before?

10 THE WITNESS: Yes.

11 BY MR. TURK:

12 Q Is it correct that as indicated on the  
13 first paragraph Mr. Michael Waters of the NRC  
14 requested that PFS revise its environmental report in  
15 order to take account of a higher burn-up and 10 year  
16 cooling time as indicated in this commitment letter?

17 A Yes.

18 Q And if I'm not mistaken my understanding  
19 of this letter is that initially PFS had calculated a  
20 dose rate of 2.1 milliREMs per year and as a result of  
21 Mr. Waters's comment the dose estimate was raised to  
22 5.85 milliREM per year. Is that consistent with your  
23 understanding?

24 A Partially my understanding.

25 Q Maybe it's more correct to say that based

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1 upon Mr. Waters's suggestion they utilize the 5.85  
2 milliREM dose rather than that dose as an alternative  
3 calculation of a lower dose. Is that more correct?

4 A Partially.

5 Q Okay.

6 A Yes and no. The dose rate that is  
7 calculated by PFS is calculated not at 600 meters but  
8 further. It's calculated at I'd have to go check but  
9 I think closer to 650 meters. The dose at 600 meters  
10 is closer to eight milliREMS per year. With that  
11 caveat, I agree.

12 Q I think you are thinking of 550 meter  
13 distance error that Dr. Redmond described.

14 A If I could just get Dr. Redmond's  
15 testimony I could point to the line.

16 Q But that's what you are referring to?

17 A No. If you turn to page D-7 of Dr.  
18 Redmond's report, you will notice that the dose that  
19 he calculates, the 5.85 milliREMs per 2,000 hours per  
20 year is at a distance of 645.72 meters. But the dose  
21 at 600 meters is 8.3 milliREMs per 2,000 hours. So  
22 except for that slight change I agree.

23 MS. CURRAN: Dr. Rosnikoff, would you  
24 clarify for the record what document you are referring  
25 to?

1 THE WITNESS: I'm sorry. I'm reading  
2 Radiation Shielding Analysis for the PFS Site. It's  
3 Holtec report 971645.

4 BY MR. TURK:

5 Q And the distance that you described,  
6 that's the distance from what? Can you explain that  
7 both with respect to the 600 meter value and the  
8 645.72 meter?

9 A The distance from the outer edge of the  
10 cask along the Esphy (PH) north face.

11 Q Is that your answer with respect to both  
12 those values?

13 A I didn't hear you.

14 Q For both the 600 meter and the 345.72  
15 meter case, is it your belief that it's the distance  
16 from the cask?

17 A It says distance from outer edge of cask  
18 along the Esphy (PH) north face.

19 Q Do you know where the 600 meter  
20 demarcation runs from?

21 A That's stated on page D-7. Position along  
22 front of north face relevant to east most cask -- from  
23 outer edge of cask along Esphy (PH) north face.

24 CHAIRMAN FARRAR: The distance from the  
25 cask to what? We don't have that document in front of

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1 us.

2 THE WITNESS: It's the distance from the  
3 edge of the cask out to 600 meters.

4 CHAIRMAN FARRAR: What's at 600 meters?

5 THE WITNESS: The fencepost.

6 CHAIRMAN FARRAR: Okay.

7 MR. TURK: It would be the controlled area  
8 fencepost.

9 THE WITNESS: Yes, that's right.

10 BY MR. TURK:

11 Q Now if your understanding is correct then  
12 the dose at 600 meters from the cask would not be 5.85  
13 milliREMS but it would be 8.30 milliREMS.

14 A That's right.

15 Q And yet both PFS and the staff understand  
16 that the 600 meter dose is 5.85 milliREM. Do you  
17 believe that the staff and PFS misunderstand the 600  
18 meter dose?

19 A Something is inconsistent. That's right.

20 Q Your understanding of those measurements  
21 is that they do not jive with the Applicant's and the  
22 staff's understanding?

23 A Yes, something is inconsistent.

24 Q Then I suggest to you that perhaps that  
25 the dose calculated at 600 meters is not from the cask

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1 but instead it's from the security fence within the  
2 controlled area boundary?

3 A This doesn't say that.

4 Q Let me move on. Do you understand that  
5 shielding from gamma and neutron radiation is a  
6 function of the mass of the shielding?

7 A Yes.

8 Q In the event that the steel shell of the  
9 cask was to flattened in a localized area would that  
10 reduce the mass that's present there in the steel?

11 A No it would rearranged it though. It  
12 could rearrange it I should say if the mass of the  
13 shielding were thinner where the dose rates are higher  
14 and the mass will move to the outer edges of the cask  
15 where the dose rates are lower then the dose rates  
16 would generally increase.

17 Q If the mass does move and I assume this is  
18 a hypothetical case that you are describing, right?

19 A Yes.

20 Q If the mass does move from one location to  
21 the next, that means that the shielding in the  
22 location to which it has moved would be increased.  
23 Correct?

24 A From which it has moved would increase.  
25 To which --

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1 Q No, the reduction of mass in one location  
2 that would mean since it is nearly moving that it  
3 increases the shielding protection in the other  
4 location.

5 A That's right.

6 Q The same is also true with respect to the  
7 concrete located within the shells of the cask. Is  
8 the correct?

9 A That's right. But the effect could be an  
10 increased dose.

11 Q It could be or it could be a decreased  
12 dose. Correct? Depending upon the amount of  
13 radiation at that particular point in the cask.

14 A That's also true depending on how the cask  
15 fell.

16 Q Are you aware that Mr. Waters in  
17 performing his calculation for the dose from the  
18 bottom of HI-STORM 100 cask essentially started with  
19 the HI-TRAC cask and took that dose?

20 A Yes.

21 Q And you are aware also that he did not  
22 reduce that dose to take credit for the increased  
23 shielding provided by the bottom of the HI-STORM 100  
24 cask?

25 A Yes.

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1 Q So that was a conservative approach by Mr.  
2 Waters?

3 A It was. It was more conservative than  
4 mine.

5 Q In your Exhibit 141(a), I believe you have  
6 two cases. They are described as case one and case  
7 two.

8 A Yes.

9 Q Could you explain the difference between  
10 those cases?

11 A Yes. Case one takes the dose at the  
12 bottom of the cask but reduces it by the area that  
13 allows the neutrons and gammas to exit the bottom of  
14 the cask an annular area. That area was estimated to  
15 be 13.45 percent of essentially the MPC area.

16 The second case involved reducing it by a  
17 factor of 10. The reason for that is we couldn't  
18 using the rough methods that we used account for any  
19 scattering that would be caused by the fact that the  
20 source was recessed inside the bottom of the HI-STORM  
21 cask. So we had a range of numbers that we used  
22 because of that.

23 Q And how did you choose a factor of 10?

24 A I just took it out of the air. We didn't  
25 know how to estimate that again without using the

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1 Monte Carlo calculation.

2 Q In the exhibit, you indicate that you  
3 believe that in effect this is an over estimate?

4 A Were are you reading?

5 Q Page two of eight in Exhibit 141. The  
6 bottom of page two of eight.

7 A Bottom of what did you say?

8 Q Two of eight. Four lines from the bottom  
9 there's a statement that reads "Both this is an  
10 overestimate. The MPC container stops at the inner  
11 radius of the annulus indicating that there is no  
12 direct path to it. Therefore as a second  
13 approximation reproduced the area by a factor of 10."

14 A Yes that's right.

15 Q I see. You're saying that the 13.45  
16 percent was the over estimate.

17 A That's why we have a range. Our estimate  
18 is the number somewhere in between.

19 Q It's correct though that there is no spent  
20 fuel located within the annulus between the MPC and  
21 the outer wall for the base of the HI-STORM 100 cask  
22 and the outer wall of the cask. Right? Outer wall  
23 meaning the shell, the protecting area.

24 A I believe that's right.

25 Q In that event why is a factor of 10

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1 appropriate? Why do you include anything there? You  
2 could have used a factor of 50 reduction or a factor  
3 of 100 reduction just as easily?

4 A It was difficult for us to estimate.  
5 There's a matter of scattering that takes place. In  
6 addition there is a direct path from the fuel to the  
7 outside. We couldn't really estimate those factors so  
8 we took a reduction by a factor of 10.

9 Q But it's true that some other factor might  
10 have been more appropriate.

11 A Again the better way to do it is to use a  
12 Monte Carlo analysis. We're the only one that's even  
13 made an estimate of this. The Applicant has not.

14 Q But could you answer my question? Isn't  
15 it correct that a different factor than 10 could have  
16 been used in your calculation?

17 A Yes.

18 Q In your case one calculations, do you  
19 account for the steel and the concrete at the bottom  
20 of the HI-STORM 100 overpack?

21 A Yes, we did as far as gamma was concerned.

22 Q Can you show me where that is in your  
23 calculation?

24 A It's hidden. It would be in the  
25 spreadsheet that gave rise to this.

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1 Q My understanding of your calculation is  
2 that you included the steel in the base plate which is  
3 I believe two inches?

4 A That's right.

5 Q That's what you included in your  
6 calculation.

7 A The steel in the base plate and also we  
8 took into account what lead and steel there was in the  
9 HI-TRAC. We worked backwards from the dose that is at  
10 the bottom of the HI-TRAC which is the only one that's  
11 been calculated to what the dose would be inside the  
12 cask. Then we worked forward from the HI-STORM and  
13 estimated what the dose would be on the outside of the  
14 HI-STORM cask taking into account in both cases the  
15 steel and lead shielding.

16 Q Do you have a copy of Staff Exhibit V with  
17 you there? It's the diagram of the HI-STORM storage  
18 cask with the MPC inside it.

19 MS. CHANCELLOR: Did you say V as in  
20 victory?

21 MR. TURK: Yes.

22 THE WITNESS: I have that.

23 BY MR. TURK:

24 Q Do you see at the bottom of the cask  
25 there's an area above the base plate of concrete and

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1 above that there's a layer of steel? Do you  
2 understand those cross hashing marks that way? That  
3 would in the pedestal of the HI-STORM 100 cask.

4 A Yes I see that.

5 Q Is it correct that the concrete is  
6 approximately 17 inches?

7 A Yes.

8 Q And the steel above it is about five  
9 inches?

10 A Yes.

11 Q Where is that accounted for in your  
12 calculation?

13 A The steel is accounted for by the fact  
14 that we know what the dose is at the bottom of the HI-  
15 TRAC. The steel plate is already in there in the HI-  
16 TRAC. It's part of the MPC.

17 Q When you say the steel plate you mean the  
18 two inch base plate.

19 A No, I don't. I mean the part of the base  
20 of the MPC. When we did the calculation that was  
21 already accounted for because that was the dose that  
22 comes from the bottom of the HI-TRAC cask and that  
23 already includes this five inches of steel. So that's  
24 the way we accounted for that.

25 Q Are you stating that the steel that's at

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1 the base of the MPC is the same thing as the five inch  
2 steel shown here for the pedestal in the HI-STORM 100  
3 overpack?

4 A That was our understanding when we did the  
5 calculation.

6 Q Where did you get that understanding?

7 A I'd have to go back and look at some other  
8 diagrams. That was our understanding and our  
9 assumption when we did the calculation.

10 Q Do you recognize that the MPC has two and  
11 a half inches of steel at its base not five inches?  
12 Or are you not aware of that?

13 A The HI-TRAC has two and a half inches of  
14 steel. I'm really winging it. I need to really go  
15 back and look at the diagrams and the dimensions.

16 Q You can't point to anything now that would  
17 indicate that there are five inches of steel in your  
18 case one calculation which would be accounted for by  
19 the pedestal of the HI-STORM 100 overpack.

20 A I need to go back and really look at the  
21 diagrams to answer this question.

22 Q And which diagrams would you want to look  
23 at in order to see that answer?

24 A I want to go back and look at the HI-TRAC  
25 diagram.

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1 Q How did you account for concrete at the  
2 base of the HI-STORM 100 overpack in your calculation?

3 A I really need to go back and look at these  
4 diagrams. I think we need to take a break so I can  
5 take a look at the diagrams.

6 MS. CURRAN: Can we take a break?

7 BY MR. TURK:

8 Q Before breaking I would just ask you that  
9 as you sit here today you're not aware that you  
10 included concrete in your calculation that would be  
11 represented by the 17 inches of concrete at the base  
12 of the pedestal?

13 A The way we took that into account is by  
14 this factor of 10, the fact that it's recessed 22  
15 inches is to use this factor of 10.

16 Q One more question here. That's case  
17 number two. What about case number one?

18 A For case number one, we simply took as we  
19 recalculated what the dose would be at the bottom we  
20 simply took the area of the annulus where there is no  
21 shielding. That's the 13.45 percent of the MPC area.  
22 We simply took that fraction, the annulus fraction.

23 Q So you did not specifically include any  
24 credit or consideration of the pedestal of the HI-  
25 STORM 100 overpack of 17 inches of concrete?

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1           A       We are assuming that no radiation comes  
2 out of that section of the HI-STORM. No radiation  
3 comes out of that section. It only comes out of the  
4 annulus.

5           MR. TURK: Your Honor, I'm up to item 38.  
6 There are several questions after that which I'm  
7 striking. I would estimate no more than about 10 to  
8 12 minutes.

9           CHAIRMAN FARRAR: Why don't we take the  
10 break we talked about and have the witness take a look  
11 at the documents that he wants to. Is that all right,  
12 Ms. Curran?

13           MS. CURRAN: Yes.

14           CHAIRMAN FARRAR: It's five after. Let's  
15 give the witness plenty of time. Let's come at 20  
16 after which will give him time to look at everything.  
17 We will try to wrap up this evening. Off the record.

18                   (Whereupon, the foregoing matter went off  
19 the record at 5:07 p.m. and went back on  
20 the record at 5:20 p.m.)

21           CHAIRMAN FARRAR: Dr. Resnikoff, have you  
22 had sufficient time to review the materials you wanted  
23 to?

24           THE WITNESS: I did, and I have to say I  
25 don't understand counsel's question.

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1 CHAIRMAN FARRAR: For now I just want to  
2 make sure you had time to, you've had time to review  
3 them. Is there a question pending, or do you want to  
4 elaborate on a prior answer, or what do we have here?

5 MR. TURK: I think I will just ask a  
6 question at this point, Your Honor.

7 CHAIRMAN FARRAR: All right.

8 BY MR. TURK:

9 Q My question, Dr. Resnikoff, really goes to  
10 trying to understand how you modeled in your  
11 calculation the shielding afforded by the bottom of  
12 the HI-STORM 100 cask.

13 And you indicated that you considered the  
14 base plate, that two inch layer of steel at the bottom  
15 of the HI-STORM cask. And then my question went to  
16 where, in case 1, do you account for the concrete, the  
17 17 inches of concrete, and the five inches of steel in  
18 the pedestal of the HI-STORM over pack.

19 And as I understand your answer, as we --  
20 just before we broke, the way you dealt with that is  
21 that you used this 13.45 percent comparison of the  
22 space of the annulus as compared to the entire space,  
23 the entire area of the bottom of the cask.

24 Is that your answer, or is there something  
25 more that I don't understand?

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1           A       Well, that is essentially right. The area  
2 of that part, the pedestal plus the steel, we assume  
3 no dose gets through that, no neutrons, no gamma gets  
4 through that.

5                   Gamma neutrons only go through the  
6 annulus.

7           Q       And where does the 13 percent come from,  
8 or 13.45 percent?

9           A       The 13 percent is the fraction of the area  
10 that is underneath the MPC, slightly larger than the  
11 MPC. It is the fraction of the area that goes to the  
12 inner walls of the MPC. It is that annulus area.

13          Q       Can you be a little more specific? If I  
14 look at Staff Exhibit B, could you point to which  
15 portion of this diagram represents that 13.45 percent?

16          A       Yes, I can point to it.

17          Q       Okay.

18          A       How are we going to record this so that  
19 the record -- it is this annulus, this area right  
20 here.

21          Q       That is the --

22          A       That is the annulus area, it has only  
23 shielding of two inches of steel.

24                   CHAIRMAN FARRAR:   And where is that,  
25 physically, on the diagram, for the record? It looks

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1 like the lower right-hand corner when you --

2 THE WITNESS: It is the lower right-hand  
3 corner. On the bottom of the diagram there is an E  
4 and a D that is listed in the line that separates  
5 those two.

6 And if you project that line upward, that  
7 is the annular area.

8 MS. CURRAN: Clarification, you mean the  
9 annular area is above the area that is called D, the  
10 areas that are called D and C, is that what you are  
11 saying?

12 MR. TURK: I think I can clarify, if I  
13 may.

14 BY MR. TURK:

15 Q As I understand your answer, Dr.  
16 Resnikoff, looking at this diagram with the cask in a  
17 vertical position, there are two areas of white lines,  
18 one on either side of the MPC, and that is the annulus  
19 space between the MPC and the inner wall of the outer  
20 pack.

21 A That is right.

22 Q And that is the area you are referring to,  
23 I guess to be fair it is not just on one side, but  
24 also the other side of the MPC?

25 A That is right.

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1 Q And when you refer to a line between D and  
2 E, at the bottom of this drawing there is a, what  
3 appears to be simply a space marking between D and E,  
4 and that points directly up to the annular area on the  
5 right side of the MPC in its vertical position?

6 A That is right.

7 Q Where does the radiation in that, the  
8 direct radiation, in that annular area come from?

9 A The direct radiation in that annular area  
10 can come from, can come directly from the cask itself,  
11 or it can be scattered.

12 Q When you say from the cask, do you mean  
13 from the MPC?

14 A That is right.

15 Q All right. If you assume that none of  
16 that radiation comes through the pedestal of the  
17 overpack, then I'm assuming what you are talking about  
18 is radiation that spreads out from the sides of the  
19 MPC, and into the annular space?

20 A Yes, but it is also scattered.

21 Q Scattered how?

22 A Scattered off the walls and come out  
23 through the annular area.

24 Q In other words it comes out from the MPC  
25 in a lateral direction, ricochets or scatters somehow

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1 against the inner wall of the overpack, and finds its  
2 way down to the two inch base plate at the bottom of  
3 that annular area?

4 A Yes, that is right.

5 Q Now, if there is scatter, what happens to  
6 the strength of the gamma radiation involved?

7 A Well, the gamma radiation would be  
8 lessened, but also there are neutrons that will  
9 interact with the materials, and may produce gammas.

10 Q Is it fair to say that your 13.45 percent  
11 value is very rough?

12 A It is a rough number, it is a number that  
13 we put at the high end. And then to account for this  
14 recess of the MPC in the, within the concrete overpack  
15 of the HI-STORM we took an order of magnitude  
16 reduction.

17 Q Now, when you use the 13.45 percent value,  
18 that only would reflect the amount of direct radiation  
19 streaming towards the base plate, correct? Should I  
20 rephrase the question?

21 A It is the radiation that is heading  
22 downward, yes.

23 Q Okay. Does that mean that you are  
24 essentially stating that roughly 87 percent, or 86.55  
25 percent of the radiation from the MPC would be moving

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1 out in lateral directions, or towards the top of the  
2 cask?

3 A No, no. When we calculated we had to go  
4 back a step. When we calculated the dose from the MPC  
5 we did that by first looking at the HI-TRAC cask, and  
6 estimating, and taking a number as to what the  
7 exposure is at the bottom of the HI-TRAC cask.

8 So at that point we are looking at gamma  
9 and neutrons that are coming out the bottom of the  
10 cask, of the HI-TRAC, they are heading in that  
11 direction.

12 And then we went back to the HI-STORM  
13 cask, and now we have a radiation dose inside that is  
14 heading downward. That is how we calculated it.

15 Q You are not recommending that the  
16 Commission base a decision on that calculation, are  
17 you? Do you think it is properly done, and  
18 supportable?

19 A In my opinion the Applicant should do a  
20 Monte Carlo calculation of what is coming out of the  
21 bottom of the HI-STORM cask.

22 Q And that would be preferable to relying on  
23 your calculation?

24 A It would be preferable to our calculation  
25 to do a Monte Carlo calculation. And as Dr. Redmond

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1 said, it is a calculation that would take him only  
2 three days.

3 Q At certain times in your testimony today  
4 you indicated that you had studied the cask drop of 25  
5 feet. Do you recall discussing that issue?

6 A I do.

7 Q And what report were you talking about  
8 when you made those statements?

9 A I'm talking about Holtec's evaluation of  
10 the confinement integrity of the loaded Holtec MPC  
11 under postulated drop event. That is Holtec report  
12 number HI-2002572.

13 Q And in that regard you indicated that you  
14 had a concern as to whether the cask would drop in a  
15 directly vertical orientation, or at some angle?

16 A That is right.

17 Q And your understanding is that this  
18 addresses the cask drop?

19 A The MPC drop in a vertical direction, yes.

20 Q The MPC, not the cask?

21 A Not the cask.

22 Q Do you know the position of the MPC during  
23 that drop, during that assumed drop? Where is it  
24 dropping from, and what is it dropping onto?

25 A Well, it is dropping onto an, essentially,

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1 immovable object, 22 feet of concrete.

2 Q Do you understand if that is free fall, or  
3 a drop of the MPC within some structure, do you know?

4 A My understanding is it was the MPC itself.

5 Q Just allowed to drop freely onto whatever  
6 surface was below it?

7 A Yes.

8 Q You are not aware of whether there is a  
9 confinement structure of any type around it, as it was  
10 dropping?

11 (Pause.)

12 BY MR. TURK:

13 Q As you sit here, without reading the  
14 document?

15 A My understanding is that it was the MPC  
16 itself.

17 Q Is it your understanding that at the PFS  
18 facility the MPC would be free to drop 25 or 27 feet  
19 without any structure around it?

20 A It would be within a HI-TRAC transfer  
21 cask.

22 Q And then drop onto the ground below the  
23 HI-TRAC?

24 A That is one scenario, yes.

25 Q Is that the scenario that you are

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1 considering?

2 A In our assertion, yes.

3 Q So you are not considering a situation  
4 where the MPC might drop from the HI-TRAC cask down  
5 into the space within the HI-STORM 100 storage cask,  
6 that is not your consideration?

7 A That is not what we were considering, no.

8 Q In your calculation in which you assume  
9 that all the hydrogen in the concrete within the  
10 overpack is lost, are you essentially assuming that it  
11 evaporates out of the structure entirely?

12 A We assumed it simply wasn't present. I  
13 know there has been discussion about this, the fact  
14 that the concrete sits within steel walls, and that  
15 the water would have nowhere to go.

16 But in our -- we don't necessarily accept  
17 that assumption. We assume that the water is just  
18 simply not present.

19 Q You don't have a basis to disagree with  
20 that assumption as you sit here, do you? That the  
21 water would have nowhere to go?

22 A I do have a basis for disagreeing with it,  
23 yes. The basis could be that there is, the steel  
24 shell has a hole in it due to its falling, and water  
25 evaporates out. Or once the water is removed from the

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1 concrete, when the cask is then stood up on end, and  
2 the concrete surface faces the ground, that the ground  
3 might be cooler, and water could condense there.

4 So there are reasons why you could assume  
5 there is no water present.

6 Q And you have not done any calculations or  
7 analysis to determine if those are reasonable  
8 expectations? That is your --

9 A We have not done calculations, that is  
10 right.

11 Q Now, also in your calculation you are  
12 assuming that the temperature in the concrete was what  
13 temperature, 350 degrees?

14 A We took a range of temperatures, 0, 100,  
15 200, 300, and no hydrogen.

16 Q And those are degrees centigrade?

17 A Yes, that is right.

18 Q And you assumed that that thermal  
19 condition would exist, for instance, when you did your  
20 case for 100 degrees, you assumed that the concrete  
21 throughout the overpack would be at that same  
22 temperature?

23 A No, obviously 100 degrees centigrade, you  
24 know, water is steam.

25 Q I'm sorry, I just asked the question about

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1 the assumption you used in your modeling. Did you  
2 assume that that temperature was uniform throughout  
3 the concrete?

4 A Yes.

5 Q The same when you did your 200 degrees  
6 centigrade calculation, you assumed uniform  
7 temperature throughout the concrete?

8 A Yes.

9 Q And the same for the 300 degree?

10 A Yes.

11 Q That is not a realistic case, is it?  
12 Won't, in fact, the temperatures vary according to how  
13 close the concrete is located relative to the MPC?

14 A That is correct.

15 Q Do you recognize that Mr. Waters, in his  
16 calculation, utilized profile for the concrete in  
17 which the temperatures varied throughout the concrete?

18 A Yes, I do.

19 Q And that would be a more correct way to do  
20 the analysis, correct?

21 A It would be a more correct way to  
22 estimate, yes, the temperature of the concrete.

23 MR. TURK: I'm just about done, Your  
24 Honors.

25 BY MR. TURK:

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1 Q In your testimony, answers 22 and 23, 23A,  
2 you discuss cask tipover as, essentially, being  
3 equivalent to a blockage of the vents, essentially all  
4 the vents, correct? .

5 A Yes, that is right.

6 Q Would you agree that the mere fact that  
7 the cask tips over would not result in blockage of all  
8 the vents?

9 A It is -- that statement is effectively  
10 correct, in 23A.

11 Q Do you agree with my statement?

12 A Excuse me, I didn't hear you.

13 Q Did you just agree with my statement, or  
14 are you saying your testimony is correct?

15 A The testimony is correct, effectively  
16 correct.

17 Q And which statement are you referring to?

18 A The question you just asked me.

19 Q Yes. And you are pointing to a statement,  
20 I'm not sure which statement you are pointing to.

21 A Could the reporter read back the question?

22 Q I could just ask it again, to make it  
23 easy.

24 I'm asking you whether tipover of the  
25 cask, so that it lies in a horizontal position, would

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1 be equivalent to blockage of all the vents?

2 A And the answer is yes, effectively yes.

3 Q Effectively it would be equivalent?

4 A Yes.

5 Q And your basis for saying is that the  
6 convection flow would be different?

7 A The convection flow would be essentially  
8 the same. That is to say a cask lying horizontally  
9 has a little flow across the hot areas of the cask.

10 Q But you have not performed any analysis to  
11 quantify the amount of flow reduction that would exist  
12 in that situation, correct?

13 A No, my argument is as quantitative as Dr.  
14 Singh's.

15 Q Dr. Resnikoff, I have two other questions.  
16 One, first of all, you would agree that a spent fuel  
17 cask is a lower radiological risk than a nuclear power  
18 reactor? I'm sorry, strike that. I don't want to use  
19 a whole new line.

20 My one last question has to do with  
21 something that appears in your discussion of worker  
22 doses. And my reason for asking this is not to bring  
23 in the question of what is the worker dose going to  
24 be, but rather to see if the values you put in your  
25 testimony are correct or not, or perhaps there was an

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1 error in the statement you made.

2 In answer 23B you indicate that -- and  
3 this is about four lines from the bottom of 23B, you  
4 indicate that there was a calculated dose by Holtec of  
5 1.88 milli-REMs per hour, at one meter from the cask,  
6 mid-height, if all the water evaporates from a HI-  
7 STORM cask.

8 Do you see that statement?

9 A I do.

10 Q Where does that statement come from? And  
11 if I may, can I point you to State Exhibit number 143,  
12 which is one of your calculations, at page 2 there is  
13 a paragraph that begins with the words, for the  
14 concrete using the Kaplan text. Do you see that?

15 A I see that.

16 Q The next line states, further "The HI-  
17 STORM 100 SAR has specified a neutron dose rate  
18 adjacent to the mid-height of the HI-STORM overpack as  
19 1.88 milli-REM per hour, assuming 45,000 MWD-MTU five  
20 year cooled MPC 24 fuel".

21 A Yes.

22 Q Is that the origin of the statement in  
23 your testimony?

24 A I wonder if I could take this as a  
25 homework assignment?

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1 Q I'm going to conclude, this is my last  
2 question. But is that the basis for the statement in  
3 your testimony?

4 A I would have to go find the answer. But  
5 my recollection is that it comes from the SAR.

6 Q What comes from the SAR?

7 A The number 1.88.

8 Q The number that appears in your testimony?

9 A Yes.

10 Q You would agree that the dose at the  
11 surface is different from the dose at one meter?

12 A Yes, that is certainly true. So you are  
13 asking the question adjacent versus one meter?

14 Q Yes.

15 A I need to -- I would need to go check  
16 that.

17 Q If this was the basis for the statement in  
18 your testimony, in other words this being the  
19 statement that appears in exhibit 143, would you agree  
20 that your testimony would need to be revised?

21 A The two are inconsistent, I need to see  
22 which one is right.

23 MR. TURK: That is all I have.

24 CHAIRMAN FARRAR: All right, Judge Lam has  
25 a couple of questions, and then we will wrap up.

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1 JUDGE LAM: Dr. Resnikoff, if I may direct  
2 your attention to your answer to question 10 and 11.  
3 Assuming your analyses are correct, therefore there  
4 will be a dose to a hypothetical individual, at the  
5 site boundary, with a residence time of 8,760 hours,  
6 the dose your calculation shows would be 25.6 milli-  
7 REM per year.

8 And you indicate that would be a violation  
9 of Part 72.104A. What is your opinion of the degree  
10 of severity of that violation, Dr. Resnikoff?

11 THE WITNESS: The regulation is 25 milli-  
12 REMS a year. There is this added caveat, Judge Lam,  
13 that as to whether the 5.85 is at 645 meters, or 600  
14 meters, and whether it is 25.6 or some number on the  
15 order of 30, 35 milli-REMS a year.

16 But aside from that caveat, 25 milli-REMS  
17 is the limit, the allowable limit.

18 JUDGE LAM: But is it a major violation,  
19 in your opinion, or it is a minor one? Because I do  
20 see, perhaps this violation, as you maintain, perhaps  
21 would be a minor one, well within the errors of the  
22 calculation.

23 I mean, is that a correct position to  
24 take? Do we know the dose rate that accurately?

25 THE WITNESS: I'm a little confused, I

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1 have to ask you a question.

2 JUDGE LAM: Sure.

3 THE WITNESS: See, I don't know what minor  
4 and major violation is. It is a violation, is what I  
5 would call it.

6 JUDGE LAM: Okay. But then I would like  
7 to hear your answer on my second question that I asked  
8 you. Do we know the dose rate that accurately, so  
9 that we now can make a decision saying, well, it is  
10 25.6 milli-REM per year, or could it be 24.9, could it  
11 be 27, 28?

12 I mean, are there uncertainty in all the  
13 calculation here?

14 THE WITNESS: Yes, there is. Sure, I  
15 would agree to that. It could be more, it could be  
16 less. Yes, I would agree to that.

17 JUDGE LAM: Okay. Well, I'm really  
18 interested in hearing you talk about something else,  
19 other than 25 milli-REM.

20 The question is, Dr. Resnikoff, with your  
21 expertise in doing the dose analysis, and with your  
22 assumption about cask tipover, are we facing a major  
23 radiological disaster here?

24 Again, by major, is it something along the  
25 line that Judge Kline is saying, while there may be

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1 action that the licensee can take to impose zone of  
2 exclusion, and manage the situation; or are we facing  
3 something that is utterly unmanageable here?

4 THE WITNESS: That is a difficult  
5 question, as all your questions are, to answer.  
6 Because in order to estimate a radiation exposure you  
7 need some, and what we've done with all our  
8 calculations that I've done in so many years, you need  
9 some scenario, you know?

10 So my difficulty is trying to imagine a  
11 scenario. If you have an earthquake, a strong  
12 earthquake, how exactly are you going to recover the  
13 facility back to where you started? Which is how I  
14 interpret the end of the accident.

15 And there is no contingency planning,  
16 there is no discussion of any of this, you know, in  
17 the SAR. And you are asking me a question that is  
18 very difficult for me to answer, you know? Maybe you  
19 could break it up into other pieces.

20 JUDGE LAM: Well, I think you know we  
21 certainly would welcome expert opinion on maximum  
22 credible scenarios to help us to make a decision. The  
23 points that you raise, like the lack of planning, I  
24 certainly would like to hear more from you about the  
25 impact of the lack of planning.

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1           Are you saying during earthquake -- you  
2           had indicated, in some of your testimony, that perhaps  
3           there would be no access to this site, perhaps no  
4           heavy equipment could be employed.

5           But I would like to hear more from you as  
6           to this scenarios, how they would play out. Take the  
7           worse case, and take the best case. How do they play  
8           out?

9           Take the worse case, could it be that  
10          within 30 years no access will be feasible to the  
11          site?

12          THE WITNESS: I don't exactly know the  
13          answer to this question. When is the end of the  
14          accident is another issue. If you have an accident  
15          where casks have fallen over, an agreement with what  
16          NRC Staff has mentioned, that the way to reduce doses,  
17          by time and by distance, and by shielding, then one  
18          way to reduce the shielding, to reduce -- excuse me,  
19          lengthen the distance that has been used at some  
20          places, for instance at Barnwell, South Carolina, you  
21          have a large grain, keep the workers away from the  
22          cask as much as possible.

23          But then you have all these casks  
24          scattered, and then you need, it is essentially like  
25          pick up sticks, where you need to work from the

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1 outside in to finally get all the casks standing.

2 And then you have to be concerned about  
3 whether any casks are damaged, and the radiation  
4 exposures are higher than they were when you started.  
5 And when that situation is finally resolved, that is  
6 when I consider, then, the end of the accident.

7 Maybe someone else has a different  
8 definition of end of accident. And I don't know how  
9 long that takes, whether that goes out to 30 or 40  
10 years, the life of the facility, or 20 years, whatever  
11 that is. Or whether that takes 2 years.

12 JUDGE LAM: Fair enough. What about the  
13 best case scenario, Dr. Resnikoff? Could they do ten  
14 casks a day and take care of it within ten months'  
15 period?

16 THE WITNESS: The best case scenario are  
17 these air cushions. I think you need to ask PFS that  
18 question.

19 JUDGE LAM: Okay, fair enough. Well, the  
20 reason I'm exploring that, I'm well aware that there  
21 are plenty of testimony in front of us that the casks  
22 will not tip over. If tip over they would not break.  
23 And then if buried they would not melt.

24 You are the expert from the State of Utah  
25 implicating, no perhaps that is not true, perhaps they

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1 all will tip over, and all 80 of them, I mean among  
2 the 4000 casks, 80 of them would have their bottoms  
3 facing the fence, and is in that context I ask you,  
4 well are we, in that situation do we have a major  
5 radiological disaster?

6 And I guess you provided an answer to my  
7 question, the answer is you really are saying there is  
8 substantial uncertainty, in this business here, that  
9 we really don't know?

10 THE WITNESS: I would say yes. I would  
11 say you could construct some scenarios, and I haven't  
12 done that, to estimate what the length of time would  
13 be, how long it would take to right casks, keeping  
14 occupational exposures within bounds.

15 You could do, you could construct the  
16 scenario, and then you would require the contingency  
17 planning to have that happen.

18 JUDGE LAM: Okay. And, Dr. Resnikoff, one  
19 final question. If you are persuaded that no cask  
20 tipover would occur, then you would no longer have a  
21 dispute with the Applicant here?

22 THE WITNESS: I think that is right, yes.

23 JUDGE LAM: Thank you.

24 CHAIRMAN FARRAR: All right, then, we will  
25 break for the evening. Ms. Curran, you can do

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1 redirect first thing tomorrow morning, and then you  
2 are going to have rebuttal?

3 MR. GAUKLER: Yes, we will have some short  
4 rebuttal.

5 CHAIRMAN FARRAR: It will take how long?

6 MR. GAUKLER: Just looking through my  
7 notes, I would think less than a half hour.

8 CHAIRMAN FARRAR: That is your  
9 presentation?

10 MR. GAUKLER: For the rebuttal, yes.

11 CHAIRMAN FARRAR: But then we have to have  
12 cross?

13 MR. GAUKLER: I think it would be less  
14 than a half hour of presentation, probably 20 to 30  
15 minutes.

16 CHAIRMAN FARRAR: And the Staff is or is  
17 not going to have rebuttal?

18 MR. TURK: We haven't talked about, yet,  
19 there might be one or two very small points that we  
20 will address.

21 CHAIRMAN FARRAR: And then you all would  
22 want rebuttal with Dr. Resnikoff?

23 MS. CURRAN: Yes, probably 45 minutes to  
24 an hour.

25 CHAIRMAN FARRAR: So we have to get all

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1 that done by noon. Okay, get your pencils out tonight  
2 and sharpen it up. Ms. Chancellor?

3 MS. CHANCELLOR: What should I advise Dr.  
4 Arabasz? I mean, should I try and establish a time  
5 that he should be available for a conference call,  
6 should we assume it is going to be 1 or 1:30, or --

7 CHAIRMAN FARRAR: Suppose we did him, we  
8 put Dr. Stamatakos on at --

9 MS. CHANCELLOR: After lunch?

10 CHAIRMAN FARRAR: Well, I would like to  
11 make sure we finish this. And from what you just said  
12 I have my doubts.

13 MS. CHANCELLOR: Me too.

14 CHAIRMAN FARRAR: Suppose we pick a time  
15 like 3 o'clock, what does that do to the rest of the  
16 day's and week's schedule, we put Dr. Stamatakos on at  
17 3?

18 MR. TURK: How much cross examination does  
19 the State estimate for Dr. Stamatakos?

20 MS. CHANCELLOR: A couple of hours. I  
21 mean, if Dr. Stamatakos is going to agree to some of  
22 the questions, then it won't take very long. But I  
23 just don't know what response I'm going to get from  
24 him.

25 MR. GAUKLER: I would say that we may

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1 have, right now in terms of what I perceive for Dr.  
2 Bartlett and Dr. Cornell, in terms of their testimony,  
3 is roughly a day, day and a half. There may be some  
4 flexibility on Friday, so maybe we could run an hour  
5 or so in the morning on Thursday with Dr. Stamatakos.

6 But I think we definitely need to plan to  
7 be done with radiation dose consequences at least by  
8 3. Which I think is feasible.

9 CHAIRMAN FARRAR: Let's do this. In terms  
10 of the rebuttal tomorrow, you need to evaluate how  
11 important that rebuttal is on this issue, versus the  
12 other things you want to accomplish this week.

13 I once had a boss, at the Trade  
14 Association that Ms. Chancellor doesn't like, and he  
15 says here is my philosophy. Some people in Washington  
16 think everything is equally important. He says I  
17 think everything is equally unimportant.

18 Let me ask you all to think about the rest  
19 of the week, what are the things you need to prove to  
20 win your case, and what are the things where you are  
21 just trying to have the last word on something that  
22 may not be too consequential, because I would hate to  
23 have you spend your time on inconsequential things,  
24 and find at the end of the week we cut you short on  
25 things that mattered.

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1                   So you all have to make that evaluation at  
2                   which of these issues you need to bolster your case  
3                   on, and which you don't.

4                   So let's --

5                   MR. GAUKLER:       If I could suggest  
6                   something?

7                   CHAIRMAN FARRAR:   Yes?

8                   MR. GAUKLER:       Why don't we just have a  
9                   late lunch tomorrow, plan to go until about one  
10                  o'clock on the radiation dose consequences, and pick  
11                  up with Dr. Arabasz at 2?

12                  CHAIRMAN FARRAR:   At 2.

13                  MS. CHANCELLOR:   I was going to suggest  
14                  meeting earlier, too.

15                  CHAIRMAN FARRAR:   We did that once and  
16                  everyone grumbled.

17                  JUDGE LAM:       Why don't we start at 8:30?

18                  CHAIRMAN FARRAR:   All right, that is  
19                  splitting the baby, that is all right, 8:30. We will  
20                  start at 8:30, we will go until 1, and we will be  
21                  finished, and we'll run lunch until 2, and have Dr.  
22                  Stamatakos and Dr. Arabasz at 2.

23                  MS. CHANCELLOR:   Judge Farrar, is there a  
24                  number I should give Dr. Arabasz, or should we just  
25                  arrange that later?

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1 CHAIRMAN FARRAR: I don't have anyone here  
2 who knows the number. What we will do, this needs to  
3 be a one on one call?

4 MS. CHANCELLOR: That is right.

5 CHAIRMAN FARRAR: So we will just call  
6 him. You find out where he is, and we will just call  
7 him.

8 MS. CHANCELLOR: Okay, I will tell him to  
9 be at a phone by 2 o'clock.

10 MR. TURK: One of the issues we deferred  
11 today was the scope of the rebuttal that the State may  
12 seek to put on through Dr. Resnikoff. You may recall  
13 that I had asked that we allow my cross examination to  
14 conclude before we addressed the proper scope.

15 Is there anything we need to discuss,  
16 perhaps now, to resolve that so we don't take time up  
17 tomorrow?

18 MS. CURRAN: I think a fair amount has  
19 already been put into the record. And so I don't  
20 think this is -- I think it would be best just to let  
21 me ask one question, or two questions tomorrow  
22 morning, and then deal with it.

23 MR. TURK: My only note would be that I  
24 don't have any problem with rebuttal addressing the  
25 issues that are raised by the testimony that we've

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1 seen. But if it expands beyond the Contention, I'm  
2 going to object, and unfortunately I take up time when  
3 I do that.

4 CHAIRMAN FARRAR: Our rulings will be  
5 short, and the arguments and our rulings will be short  
6 and sweet.

7 Mr. Turk, you have given everyone Dr.  
8 Stamatakos' pre-filed rebuttal, I believe?

9 MR. TURK: Yes, I have.

10 CHAIRMAN FARRAR: So everyone will have a  
11 chance to look at that tonight.

12 MS. CURRAN: Judge Farrar, a question.  
13 What time does this room open, what time does the  
14 building open, do you know?

15 CHAIRMAN FARRAR: The building is open  
16 night and day.

17 MS. CURRAN: We could come in early  
18 tomorrow morning if we wanted?

19 CHAIRMAN FARRAR: Right, but you will need  
20 an escort, so you can't come in before we get some  
21 people here. So the number you call is 415-7550,  
22 somebody answers that. And then Sharon is going to be  
23 here, 415-7393.

24 MS. CURRAN: The other question was, I  
25 noticed when I came in the other morning, that the

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1 transcripts were here. But does anybody have any idea  
2 what time they -- one of the things I was thinking  
3 about, in terms of making this go faster, was looking  
4 at what happened the day before.

5 And if the words are on the paper there is  
6 no need to ask again. I just wondered if you have an  
7 idea.

8 CHAIRMAN FARRAR: Let's go off the record,  
9 and ask the Reporters if they know.

10 (Whereupon, at 6:07 p.m. the above-  
11 entitled matter was adjourned, to be resumed  
12 Wednesday, January 26th, at 8:30 a.m.)  
13  
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CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Private Fuel Storage, LLC

Docket Number: Docket No. 72-22-ISFSI

ASLBP No. 97-732-02-ISFSI

Location: Rockville, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

  
\_\_\_\_\_  
John Mongoven  
Official Reporter  
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