

1 MR. SILBERG: Are we talking about 24?

2 MR. SOPER: Is that No. 24? Or did we  
3 skip one?

4 LT. COLONEL HORSTMAN: I'm sorry, I'm on  
5 the wrong one. Thank you.

6 No. 24.

7 MR. SOPER: That's 16 December '91.

8 LT. COLONEL HORSTMAN: The engine fails.  
9 The pilot points towards an emergency airfield. The  
10 aircraft is on fire, so the pilot ejects. No  
11 indication the pilot sees anything or steers away from  
12 any ground sites. He ejects at 11,000 feet.

13 One of the things you've probably noticed  
14 is that the aircraft that are on fire, typically, they  
15 eject at a much higher altitude because they're not  
16 planning landing. They're planning on getting out of  
17 the airplane.

18 MR. SOPER: No. 25 says there was no  
19 ejection.

20 LT. COLONEL HORSTMAN: That's correct.

21 MR. SOPER: Is this of any help to us at  
22 all in attempting to avoid the PFS site?

23 LT. COLONEL HORSTMAN: Well, I think so.  
24 The engine fails after takeoff. The pilot tries to  
25 land the airplane. He's unsuccessful, destroys the

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1 airplane, receives burns. It's not in the accident  
2 report; he died later. He's not avoiding anything.  
3 He's trying to land the airplane. He's comfortable in  
4 the airplane and wants to bring it back around. He  
5 would have lived had he ejected, or we assume he would  
6 have.

7 MR. SOPER: I see the next one indicates  
8 the pilot ejected at zero feet?

9 LT. COLONEL HORSTMAN: That's correct.

10 MR. SOPER: And what do you mean by that?

11 LT. COLONEL HORSTMAN: He was able to stop  
12 the aircraft on landing. There's actually a number of  
13 cases of these kinds of accidents, of landing and  
14 missing a cable, going off the runway, or on takeoff  
15 aborting, going off the runway. They're obviously  
16 trying to land the airplane, and you can eject at zero  
17 zero. It works.

18 The key here is that this guy does a  
19 really good job. He decides to land the airplane  
20 instead of eject and is able to get it onto the  
21 concrete, and then he can't keep it on the concrete,  
22 and he ejects. There's no avoidance in there of  
23 anything.

24 MR. SOPER: And No. 27, is that, likewise,  
25 true that there's no indication of any avoidance of a

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1 ground site there?

2 LT. COLONEL HORSTMAN: Yes, sir, and he  
3 had plenty of time, three air starts. No indication  
4 that he steered away from any ground sites, and he  
5 turned towards an emergency airfield yet again. So we  
6 have another case where he wants to land the airplane  
7 and doesn't try to avoid anything.

8 JUDGE LAM: Mr. Soper, if I may interrupt,  
9 Colonel Horstman, the way the Applicant defines the  
10 ability to avoid has two elements. One is control of  
11 the aircraft. Two is sufficient time for the pilot to  
12 act.

13 Now I see that you are responding to Mr.  
14 Soper's questioning by saying, well, there's no  
15 indication the pilot saw or steered away from ground  
16 sites, would lead you to conclude that the answer to  
17 your fifth column is no, which means there's no  
18 ability to avoid.

19 My question is, if there's no indication  
20 of the pilot to steer away from ground sites, would  
21 the answer be more appropriately labeled you don't  
22 know? If there's no indication, you don't know if he  
23 has, indeed, checked or not?

24 LT. COLONEL HORSTMAN: No, I take just the  
25 opposite view. I think that we ought to prove that

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1 they have maneuvered an airplane away from a site,  
2 instead of assuming he's going to maneuver an aircraft  
3 away from the site.

4 They mention the time in the "able to  
5 avoid" and the capability. We haven't talked a lot  
6 about the capability. There's a little bit of the  
7 mental mindset of the pilot. There's the weather  
8 conditions. What if there's 100 percent cloud cover  
9 underneath you and you don't have a navigation steer  
10 point? Do you have the ability to avoid a specific  
11 ground site? Do you have the capability to do that?

12 Absence of a negative doesn't mean  
13 positive. They have not proven that any of these  
14 airplanes are avoiding a fixed ground site, which is  
15 the whole crux of their argument.

16 JUDGE LAM: So your position is, when the  
17 report does not indicate the pilot either seeing or  
18 steering away from the ground site, it would have to  
19 be concluded that there's no ability to avoid?

20 LT. COLONEL HORSTMAN: No, we're drawing  
21 the inference that there's no -- he did not do that.  
22 So does that mean he's able? We can't draw that  
23 inference. In many cases we don't know what the  
24 weather was. In one case I know very specifically  
25 what the weather was, and it caused the pilot's

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1 airplane to hit a house and a golf course. But PFS  
2 says that captain is able to avoid because he has the  
3 time and the ability. He didn't have the capability  
4 to avoid. So there's a big difference.

5 JUDGE LAM: I understand your argument.

6 CHAIRMAN FARRAR: Let me follow up and ask  
7 Judge Lam's question a different way. In your fifth  
8 column or the final column, the heading shows ability  
9 to avoid, and so forth. Your emphasis in giving the  
10 answer no is on the word "shows." In other words,  
11 we've been looking at it, is there an ability? You're  
12 saying, did it show the ability, and if it didn't show  
13 the ability, you're saying no, even though the ability  
14 might have been there? You're saying you won't draw  
15 the inference that the ability was there? You're  
16 saying it doesn't show, is what you're saying?

17 LT. COLONEL HORSTMAN: It doesn't, and as  
18 I understand it, they have to prove their point, and  
19 we're proving that they can't.

20 CHAIRMAN FARRAR: Yes, okay. Go ahead,  
21 Mr. Soper.

22 MR. SOPER: Thank you, Your Honor.

23 Lieutenant Colonel Horstman, I think we  
24 have the flavor of your review of these. I take it  
25 you reviewed each and every mishap report for which a

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1 mishap date appears here?

2 LT. COLONEL HORSTMAN: I've reviewed all  
3 the PFS reports, all the accident reports that PFS  
4 proffered to us, which were the original 129. Out of  
5 that, there's these 59 and the two that they selected  
6 to not put in the database: the one over the ocean  
7 and the one in Panama that have been mysteriously  
8 omitted from the database.

9 MR. SOPER: Rather than going through each  
10 one of these, let me just pick out a couple. I notice  
11 Entry No. 33 you say that the report concludes that  
12 the crash was caused by pilot error?

13 LT. COLONEL HORSTMAN: Yes, sir.

14 MR. SOPER: That's No. 33; 30 March '94  
15 was the accident date. I take it that the mishap  
16 report itself uses those words, "pilot error"?

17 LT. COLONEL HORSTMAN: Yes, it does. And  
18 what's interesting is that we've kind of danced around  
19 that here. In the 150 accident reports that I  
20 reviewed, I concluded that 70 of them were caused by  
21 pilot error, and we're led to believe that pilots  
22 aren't going to make mistakes because of this  
23 wonderful training, and yet they're crashing  
24 airplanes; they're ejecting below all kinds of  
25 minimums.

1                   So almost half of these accidents are  
2 caused by pilot mistakes. Over half of the ejections  
3 are below 2,000 feet. And I'm to believe that the  
4 pilots will be a magnificent hero by ejecting above  
5 2,000 feet and avoiding it, and that doesn't happen  
6 half the time.

7                   MR. SOPER: Let me direct your attention  
8 to No. 40. This indicates that the pilot ejected  
9 above an overcast at 2,100 feet, and you've concluded  
10 the pilot couldn't see the ground.

11                   LT. COLONEL HORSTMAN: In his accident  
12 condition he had stated in there he could not see the  
13 ground. It was overcast. And he, again, has third-  
14 party help, and I do not believe that would ever occur  
15 in Skull Valley. I believe it might occur near Salt  
16 Lake City, but I do not believe that you would ever  
17 get that kind of information for Skull Valley.

18                   MR. SOPER: Let me direct your attention  
19 to No. 42. You again conclude that the pilot couldn't  
20 see the ground. Is that from information in the  
21 mishap report?

22                   LT. COLONEL HORSTMAN: Yes, sir, and,  
23 again, you know, we've tried to avoid talking about  
24 the weather as though it doesn't exist. In these  
25 cases the weather was a factor as to their ability to

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1 avoid the site, and they were in the clouds and didn't  
2 have the ability.

3 MR. SOPER: Let me call your attention to  
4 No. 46. You indicate that the aircraft was on fire  
5 and that the aircraft pitched forward violently. Was  
6 that aircraft controllable by the pilot?

7 LT. COLONEL HORSTMAN: Oh, no. No, the  
8 aircraft was completely out of control, and that's a  
9 very bad thing. So he ejects.

10 MR. TURK: Which one?

11 MR. SOPER: No. 46.

12 LT. COLONEL HORSTMAN: As a matter of  
13 fact, the aircraft impacted at a steep dive angle. To  
14 assume in this case that the aircraft could be pointed  
15 away from anything is ludicrous as thinking you can be  
16 pointed towards anything. If the aircraft is out of  
17 control, the pilot is not flying it; he's a passenger,  
18 and if he stays in the craft, he's going to die. So  
19 you eject.

20 MR. SOPER: Let me ask you to look at No.  
21 53. The facts indicate the aircraft is on fire again,  
22 and that it began an uncontrolled climb into the  
23 clouds, and the pilot ejected. How could there be an  
24 uncontrolled climb into the clouds?

25 LT. COLONEL HORSTMAN: The pilot's flying

1 the airplane. The airplane flight controls or  
2 something malfunctioned. The aircraft pitches up.  
3 The pilot pushes down on the stick to counteract the  
4 flight control inputs. Nothing happens. You go into  
5 the clouds. Now you're inside the weathers in  
6 instrument conditions and the aircraft does not  
7 respond to pilot inputs. It's time to get out.

8 MR. SOPER: Now are those the facts that  
9 actually happened in this case?

10 LT. COLONEL HORSTMAN: Yes.

11 MR. SOPER: So, again, the pilot bails out  
12 while the aircraft is under control?

13 LT. COLONEL HORSTMAN: No.

14 MR. SOPER: Or not under control? Excuse  
15 me.

16 LT. COLONEL HORSTMAN: No, the aircraft is  
17 out of control when the pilot ejects. An aircraft  
18 doesn't have to be in a full inverted spin like in  
19 "Top Gun" to be out of control. If it doesn't respond  
20 to the pilot's inputs, it's not in control of the  
21 pilot.

22 MR. SOPER: And the pilot was also in  
23 clouds at the time he ejected?

24 LT. COLONEL HORSTMAN: That's correct.

25 MR. SOPER: So he wouldn't be able to see

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1 the ground as well?

2 LT. COLONEL HORSTMAN: No, couldn't see  
3 the ground and couldn't maneuver the airplane in any  
4 manner or fashion.

5 MR. SOPER: Let me call your attention to  
6 No. 58, 13 January '95.

7 LT. COLONEL HORSTMAN: This is the one I  
8 briefly spoke about to the judge. This is a guy in my  
9 squadron, Captain Smith, ejected above the clouds, had  
10 no reference for anything underneath the clouds. The  
11 aircraft hit a golf course. The fuel tanks hit a  
12 house.

13 It says damage is, "None reported." That  
14 is because the claims for hundreds of thousands of  
15 dollars were filed after the Accident Board was  
16 closed. So there was significant damage to a farmer's  
17 house, to a golf course, and the pilot, who's a good  
18 friend of mine, had no idea where the airplane was  
19 going to hit.

20 Out of those 59 we just reviewed, 7  
21 percent of those were out of control. So the first  
22 thing it makes me wonder is, how do you come up with  
23 95 percent when 7 percent of the airplanes are out of  
24 control?

25 MR. SOPER: The other mishap dates that we

1 did not review, you've concluded that they did not  
2 show the ability to avoid a ground site such as the  
3 PFS site, for the reasons that you've noted under the  
4 "Mishap Facts" and the other entries, including the  
5 ejection altitude. Is that correct?

6 LT. COLONEL HORSTMAN: That's correct.  
7 Below -- or above 2,000 feet they did not have the  
8 ability.

9 MR. SILBERG: I'm sorry, they didn't have  
10 the ability to what?

11 LT. COLONEL HORSTMAN: To avoid the PFSF.

12 MR. TURK: If what? I didn't hear the  
13 answer, either. You changed the answer in the middle.  
14 I wasn't sure what you were saying.

15 MR. SILBERG: Could you read back the  
16 question and the answer?

17 (Whereupon, the previous question and  
18 answer were played back by the court reporter.)

19 MR. TURK: Your Honors, I think the  
20 question was so vague and the answer confused, I would  
21 ask that we simply re-ask the question and get a clear  
22 answer, disregard the one that just copied, because I  
23 don't know what the question or answer were, even  
24 after hearing it twice.

25 (Laughter.)

1 MR. SOPER: I would be happy to do that.

2 CHAIRMAN FARRAR: Yes, I think that's a  
3 good idea in this instance.

4 MR. SOPER: Colonel Horstman, we have  
5 talked about some of these mishaps particularly, and  
6 we've discussed your opinion as to why you indicated  
7 that the mishap did not indicate -- let me start over.  
8 That's going to be a long question already.

9 (Laughter.)

10 CHAIRMAN FARRAR: Maybe after doing 59 of  
11 these and 59 minutes, you're entitled to one  
12 misstatement.

13 (Laughter.)

14 MR. SOPER: Thank you, Your Honor. That's  
15 kind of you.

16 As to the events that we didn't review,  
17 the particular mishaps that we didn't review, you have  
18 indicated "no" in the column at the furthest right  
19 here, "Shows ability to avoid ground sites such as the  
20 PFS site." You've indicated no in every column, is  
21 that right?

22 LT. COLONEL HORSTMAN: That's correct.

23 MR. SOPER: And your reason for that as to  
24 each one is indicated in the "Mishap Facts" and/or the  
25 "Ejection Altitude" that you've included on this

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1 report, is that right?

2 LT. COLONEL HORSTMAN: That's correct. In  
3 no case did any pilot demonstrate the ability to avoid  
4 a ground site above the 2,000-foot minimum ejection  
5 altitude.

6 MR. SOPER: Now let me ask you what you  
7 mean by that. In cases where -- of course, we would  
8 expect the pilot to bail out at 2,000 feet or above in  
9 Skull Valley, would we not?

10 LT. COLONEL HORSTMAN: You would.

11 MR. SOPER: And so for every accident that  
12 you looked at where the pilot ejected at that altitude  
13 or higher, you've concluded there's nothing in the  
14 report that shows that the pilot saw a ground site and  
15 took some action to avoid the ground site, is that  
16 correct?

17 LT. COLONEL HORSTMAN: A specific ground  
18 site, that's correct.

19 MR. SOPER: And I notice that your double  
20 asterisk behind the "no" in certain mishaps is  
21 referenced on the back page as being this notation:  
22 "A reference to a pilot pointing an aircraft away from  
23 a populated area or pointing towards a sparsely  
24 populated area does not demonstrate the ability to  
25 avoid a specific site (such as the PFSF) located

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1 within a sparsely populated area."

2 Is that, in fact, your reasoning?

3 LT. COLONEL HORSTMAN: Yes, sir, it is.

4 MR. SOPER: And does that need any  
5 explanation?

6 LT. COLONEL HORSTMAN: There's no evidence  
7 to support anything other than that.

8 MR. SOPER: And your assumption there is  
9 that the crash site itself is in what you would either  
10 call a sparsely or unpopulated area?

11 LT. COLONEL HORSTMAN: Yes, it is.

12 MR. SOPER: The fact that a pilot turns  
13 towards such an area gives you no indication the pilot  
14 would miss the PFS site?

15 LT. COLONEL HORSTMAN: Can you expand on  
16 that? I'm not sure of the question.

17 MR. SOPER: Yes. The notion that a pilot  
18 is turning his plane towards a sparsely populated area  
19 gives you no indication that the pilot could avoid the  
20 PFS site?

21 LT. COLONEL HORSTMAN: No, and let me give  
22 you a couple of -- a scenario and an example. The  
23 example would be a pilot in the North Utah Test and  
24 Training Range, and the accident report, while it's  
25 not in this 59, it says he pointed towards an

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1 uninhabited area from about 5,000 feet above the  
2 ground. And you do the math and you find out where he  
3 was and how far the aircraft could fly. The only man-  
4 made structures within 15 miles of him, well beyond  
5 his reach, were barbed wire fences.

6 So success in that case would be measured  
7 in any of 360 degrees of a heading. So did he avoid  
8 anything? In fact, there's nothing to avoid.

9 The other scenario is we've shown that in  
10 well over half of these accidents the pilots are going  
11 to aim to an emergency airfield. In this arena we  
12 know, and PFS has agreed, it's going to be Michael  
13 Army Airfield. So now a pilot's attention is focused  
14 on Michael Army Airfield, not crashing. That's a  
15 subsequent activity. He's already over a sparsely  
16 populated area.

17 The way he would orient himself towards  
18 Michael is to select that steer point, and now he has  
19 reference to Michael Army Airfield, which is very  
20 important to him, and he has no reference to any  
21 ground object except what he can see visually with his  
22 eyes. We know that 50 percent of the time weather is  
23 a factor. So what is his ability to avoid a specific  
24 site in a sparsely populated area? Well, it depends  
25 on the circumstances, and we don't see any

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1 circumstances in any of these accident reports to  
2 support that claim that he will be able to do that.

3 MR. SOPER: Thank you.

4 I would offer State Exhibit 223.

5 CHAIRMAN FARRAR: Any objection?

6 MR. GAUKLER: I just have one real quick  
7 voir dire question.

8 VOIR DIRE EXAMINATION BY MR. GAUKLER

9 MR. GAUKLER: You said at the beginning of  
10 your testimony that "We reviewed the accident  
11 reports," and who is "we"?

12 LT. COLONEL HORSTMAN: Mr. Soper and I.

13 MR. GAUKLER: And this reply reflects your  
14 work product or yours and Mr. Soper's, or --

15 LT. COLONEL HORSTMAN: I'm sorry.

16 MR. GAUKLER: This work product reflects  
17 your -- is this work product yours or yours and Mr.  
18 Soper's?

19 LT. COLONEL HORSTMAN: Mine and Mr.  
20 Soper's together.

21 CHAIRMAN FARRAR: Any objection, Mr.  
22 Gaukler?

23 MR. GAUKLER: Have you read through all  
24 the accident reports yourself, and do you subscribe to  
25 all the facts and statements stated here?

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1 LT. COLONEL HORSTMAN: All of the accident  
2 reports you provided us, including those not in the  
3 table, I have read.

4 MR. GAUKLER: No objection.

5 CHAIRMAN FARRAR: Staff?

6 MS. MARCO: The staff has no objection.

7 CHAIRMAN FARRAR: All right, State Exhibit  
8 223 will be admitted.

9 [Whereupon, the above-referred-  
10 to document marked as State  
11 Exhibit 223 for identification  
12 was received in evidence.]

13 CHAIRMAN FARRAR: Back to you, Mr. Soper.

14 MR. SOPER: Thank you, Your Honor.

15 LT. COLONEL HORSTMAN: May I take a break,  
16 please?

17 MR. SOPER: I was going to maybe suggest  
18 a short break.

19 CHAIRMAN FARRAR: Let's go off the record.

20 (Whereupon, the above-entitled matter  
21 went off the record at 2:41 p.m. and went  
22 back on the record at 2:52 p.m.)

23 CHAIRMAN FARRAR: Mr. Gaukler, do you need  
24 your Co-Counsel for us to continue?

25 MR. GAUKLER: Let me get him real quick,

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1 Your Honor.

2 MR. SILBERG: The answer to your question  
3 is no.

4 CHAIRMAN FARRAR: Well, one day Mr.  
5 Travieso-Diaz was late and so I was in the midst of a  
6 default judgment, I was in a --

7 MR. SILBERG: Hopefully Mr. Donnell wasn't  
8 here to hear you say you don't need your co-Counsel,  
9 since he is paying for all of them.

10 CHAIRMAN FARRAR: Mr. Soper I think  
11 everyone is here, if you want to resume.

12 MR. SOPER: Thank you, Your Honor.

13 MR. TURK: Could we get an indication of  
14 an approximation of how much --

15 CHAIRMAN FARRAR: Just for purposes of  
16 everybody planning, how much more are you looking at?

17 MR. SOPER: I'm thinking a half an hour  
18 might do it.

19 CHAIRMAN FARRAR: Okay. Then we will have  
20 cross by the Applicant. Mr. Gaukler, how long are you  
21 thinking about?

22 MR. GAUKLER: I don't know yet, Your  
23 Honor. I have to talk with everybody.

24 CHAIRMAN FARRAR: Okay. Grab the  
25 microphone, if you would.

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1 MR. SILBERG: We might also benefit from  
2 being able to review some of the stuff this evening,  
3 and one suggestion I have is perhaps we could put the  
4 Staff's witnesses on following completion of the  
5 bubble phase, and before we cross Lt. Col. Horstman.

6 CHAIRMAN FARRAR: That might make sense,  
7 because here with the instructions that we would give  
8 you, in terms of that, and recognizing we have 59  
9 reports here, to remember that this is cross  
10 examination, that we don't need any elaborate reading  
11 into the record of what is in the reports, and getting  
12 the person to agree that that is what is in there.

13 That we would urge you just to do what Mr.  
14 Soper did, ask the question. If you think Lt. Col.  
15 Horstman opinion about an accident is wrong, just ask  
16 him. Doesn't the accident report say such and such,  
17 and isn't that inconsistent with what you said.

18 MR. SILBERG: If we can get his answers.  
19 Lt. Col. Horstman short as the answers that he gave,  
20 Mr. Soper would probably be fine.

21 CHAIRMAN FARRAR: Well, sometimes the  
22 problem is in -- even if the answer is prolix,  
23 sometimes the bigger problem is setting too much of a  
24 stage with cross examination.

25 We have all the reports in front of us, we

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1 know what is going on, just ask the question. If you  
2 think he has misstated something, just come right at  
3 it without a whole lot of preface, and we will move a  
4 lot faster.

5 MR. SILBERG: I think if we have the  
6 ability to work on this, this evening, it will be  
7 shorter than if we try to do it --

8 CHAIRMAN FARRAR: Right, I tend to agree  
9 with you.

10 MR. GAUKLER: One thing I would like to  
11 ask, that would definitely help during my cross  
12 examination, Lt. Col. Horstman stated that 7 percent  
13 of these accidents he would classify as  
14 uncontrollable.

15 Which I take you mean the same thing as  
16 not able to avoid?

17 THE WITNESS: Not -- they are  
18 uncontrollable.

19 MR. GAUKLER: And which one would those  
20 be? That would help me, so I know exactly which ones  
21 you are talking about.

22 MR. SILBERG: Are those the ones that say  
23 not controllable in the last column?

24 THE WITNESS: Yes, they are. There is  
25 four of them out of 59, which is 7 percent.

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1 CHAIRMAN FARRAR: Good thank you. Well,  
2 will this game plan work for the Staff to put on your  
3 panel this afternoon?

4 MS. MARCO: Well, I believe the Staff  
5 would like to consider the impact of the testimony on  
6 its rebuttal. And I think ultimately we would save  
7 time.

8 MR. SOPER: We have another suggestion.  
9 And the reason is --

10 CHAIRMAN FARRAR: Okay, so that was a no?  
11 That was a no, okay.

12 MR. SOPER: There might be another  
13 approach, and that would be to cross examine on  
14 matters other than the State exhibit 223, and the  
15 reports that are linked to it. Do the other cross  
16 examination and then come back and do the reports.

17 CHAIRMAN FARRAR: That may be, given what  
18 Ms. Marco said, that may be a better suggestion. All  
19 right, why don't we think about that, and when Mr.  
20 Soper finishes you can let me know how you feel about  
21 that.

22 All right, go ahead, Mr. Soper.

23 MR. SOPER: Thank you.

24 BY MR. SOPER:

25 Q Lt. Col. Horstman would you look at PFS

1 exhibit 245, please? I take it everyone still has --

2 A What is the title?

3 Q It is Salt Lake City weather observations  
4 2001, is how it reads in the first page, it is a three  
5 page document.

6 A I have that.

7 Q How many times did you have an opportunity to look that  
8 over and --

9 A Yes.

10 Q And you heard the testimony relating to  
11 it?

12 A I did.

13 Q Do you find anything about that table to  
14 be significant to the notion of a pilot flying through  
15 Skull Valley?

16 A Yes, it does give some -- a better  
17 picture, although a word picture of weather  
18 conditions, and the fact that they are layered, and  
19 they are stacked, and that they are cumulative on top  
20 of each other.

21 And it supports exactly what we've stated  
22 before, and that weather is a significant factor, and  
23 a large percent. Below 5,000 feet AGL weather is a  
24 factor, or weather can be a factor 21 percent of the  
25 time, and weather is a definite factor 12 percent of

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1 the time.

2 If you assume a 3 to 4,000 foot AGL,  
3 engine failure, which is what we continue to talk  
4 about, and the pilot zooms, he is going to go up a  
5 third of the way, maybe halfway through the second  
6 block, so you can use about half of that.

7 Q What do you mean by that?

8 A Well, the pilot is going to zoom, if he is  
9 at 4,000 feet and 425 knots, he is going to zoom to  
10 about 8,000 feet. I could look up the precise answer,  
11 but 7,500 to 8,000 feet above the ground.

12 So you are well into the category of  
13 greater than 5,000 feet, and less than 14,000 feet.  
14 So knowing that the weather is stacked, and layered,  
15 and cumulative, you could use a portion of that.

16 How much? Under a half, I don't know, we  
17 could do the math. But the bottom line is that this  
18 does indicate that there is a significant amount of  
19 clouds below where the pilot would be. And it would  
20 impact his ability to see some or all objects on the  
21 ground.

22 MR. SILBERG: Excuse me, before you go on  
23 to that, could I just get a clarification? You said  
24 the pilot could use a portion of that. When you say  
25 that, are you referring to the airspace between 4,000

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1 and 8,000 feet?

2 THE WITNESS: No, what I'm trying to do is  
3 say that when a pilot has an engine failure, and zooms  
4 his aircraft, he is going to leave the low altitude  
5 block of cloud cover observations of less than, or  
6 equal to 5,000 feet, and enter into the block of  
7 greater than 5,000, or less than or equal to 14,000  
8 feet in the summary page.

9 He will fly into that block. So a portion  
10 of that weather should be used. How much? I don't  
11 know, we could go examine it. But the point is we are  
12 talking about 50 percent of the time weather is a  
13 factor, maybe very significant.

14 This also answers half of the weather  
15 question. It doesn't talk about visibility, which is  
16 rain, or snow, or blowing dust, blowing sand, or  
17 blowing salt, or any other myriads of condition.

18 On the way in this morning you noted that  
19 it was hazy. I don't know what the visibility is, but  
20 it is an obstruction to visibility, because it is not  
21 a clear day.

22 This doesn't address the visibility at  
23 all. And to fly Skull Valley VMC you are required to  
24 have 5 miles of visibility. It also doesn't address  
25 sunrise, which is when the first couple of hours after

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1 sunrise, as Mr. Vigeant testified, two and a half  
2 percent of the time, at Michael Army Air Field we  
3 have ground fog.

4 What is that, 90 days out of the year for  
5 a couple of hours? I don't know. So you have a piece  
6 of information here that goes to support what we've  
7 been saying, that there is cloud problem in the area.

8 BY MR. SOPER:

9 Q Well, what does it mean in the category  
10 less equal, or less than 5,000 feet, and OVC, overcast  
11 9 percent of the time?

12 A That means that in the Sevier B MOA 9  
13 percent of the time the sky is obscured, I'm sorry, it  
14 is overcast. And Judge Lam asked a question about  
15 what that meant, and one of the previous testimony  
16 answers is that you can see through it.

17 Well, overcast in this paper is defined as  
18 overcast 8/8 cloud cover. And I would like to show a  
19 brief demonstration of what that looks like.

20 MR. SOPER: May we get in the well and do  
21 that, Your Honor?

22 CHAIRMAN FARRAR: Certainly.

23 MR. SOPER: May I assure the Board that  
24 this is not going to be a lengthy demonstration, but  
25 we think important.

1 CHAIRMAN FARRAR: We were finished with  
2 the PFS demonstration?

3 MR. SILBERG: We had left that there at  
4 the request of the State.

5 CHAIRMAN FARRAR: Okay.

6 MR. TURK: Wouldn't an 8/8 cloud cover  
7 just be -- put another board over the whole --

8 THE WITNESS: Weather is not skin, weather  
9 is thick. It is all lined up in rows --

10 CHAIRMAN FARRAR: Wait. Col. Horstman has  
11 removed the paper board clouds from yesterday's  
12 display, and has substituted some very large styrofoam  
13 cups, 16 oz.

14 THE WITNESS: I think larger, sir.

15 CHAIRMAN FARRAR: Larger. And put those  
16 on the plastic thingies that we were dealing with  
17 yesterday. Go ahead.

18 THE WITNESS: This depicts the other  
19 extreme of weather that is 1/16th of an inch thick,  
20 and this is probably closer to the Florida type clouds  
21 that Col. Fly was talking about.

22 I did this to illustrate a point, that  
23 clouds are very difficult to see through.

24 MR. SILBERG: I'm sorry, you said Florida  
25 type clouds, or floor?

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1 THE WITNESS: Florida, state of. And here  
2 we have significant obstructions to visibility. I  
3 threw a bunch of coins out there, I don't know how  
4 many, I want to find out from all of you how many that  
5 is. You don't have a clue.

6 And when you are flying, you may or may  
7 not be able to see that as you are moving over the  
8 ground. So we are trying to visualize what a weather  
9 situation is, it is cumulative. And they are thicker  
10 than paper.

11 And as we demonstrated before, with the  
12 Scrabble tiles, you an obscure almost all of the sky  
13 with a scattered cloud deck. This is probably, I'm  
14 sure it is FEW, which is less than 2/8ths of the sky  
15 is obscured by cloud.

16 Now, Judge Lam asked, yesterday, what you  
17 would see if the sky was overcast. And you were told  
18 you would see objects on the ground. Let me  
19 demonstrate what you will see.

20 By FAA regulation you cannot see through  
21 it. You cannot see through overcast. By FAA  
22 regulation you can't land at a runway with a broken  
23 deck of 5/8ths, unless you have instrument landing  
24 systems. They won't let you, you have to carry extra  
25 gas.

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1 Weather is a huge factor in Skull Valley.  
2 Fifty percent of the time weather impacts a pilot's  
3 visibility to locate ground sites. We are talking  
4 about tiny ground sites.

5 We know that there are mountains on one  
6 side, and the weather of overcast will completely  
7 obscure all of the Cedar mountains. So all you will  
8 have is the Stansburys. And the little diamond in  
9 your HUD has been selected to the emergency air field,  
10 which has been demonstrated, by over 50 percent of the  
11 accidents.

12 So you will know what reference point  
13 Michael Army Airfield is. So as you are flying out of  
14 this weather, as I did last Wednesday, over Skull  
15 Valley, I noticed that I couldn't see very much at  
16 all. The weather at Salt Lake City was scattered.

17 I couldn't see very much at all. I was  
18 asked before if I could locate a road. I did look for  
19 the road, I located a portion of the hardball road,  
20 which we know is the Skull Valley road. I located a  
21 variety of other roads which are not on the map that  
22 we were looking at before.

23 I have no idea, based on all of my  
24 knowledge, if I could see the PFS site or not. I  
25 could not see the rocket facility, and it was just a

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1 scattered deck.

2 So here we are trying to convince you that  
3 weather is or is not a factor. And the FAA, by  
4 definition, says it is. And I completely believe that  
5 it is, and in 9 percent of the time, in the low  
6 altitude structure, you cannot see the ground.

7 And, correspondingly, if you go up to your  
8 zoom altitude, it is 13, 14, 15 percent of the time  
9 you cannot see any of the ground. I have no idea how  
10 we expect a pilot to locate, 95 percent of the time,  
11 that PFS site. Absolutely no idea what kind of tools  
12 we are going to give him to do that.

13 JUDGE LAM: Now, Col. Horstman, I  
14 understand your rationale of what a pilot does not  
15 see, then he cannot avoid. That has been the central  
16 theme of your testimony, one of the central themes.

17 But Judge Kline yesterday reminds me that  
18 we also had, on our record, that all a pilot needs to  
19 do is just to aim for the mountains. Now, presumably  
20 what you just said, you could see some of the  
21 mountain, it doesn't matter what the weather  
22 conditions are.

23 And if you intend to avoid PFS, could it be  
24 done that way? I mean, I understand you need some  
25 precise knowledge about the land target if you were to

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1 hit it. But to avoid it, would a general situational  
2 awareness be sufficient for a pilot to get away from  
3 it?

4 THE WITNESS: Well, it would certainly  
5 help. And the pilot would certainly do everything he  
6 could to avoid it, if he knew he was going to be in  
7 danger. But we haven't seen that as the case, at all.

8 So in the case I just discussed, the only  
9 mountains you have are the Stansbury mountain range,  
10 which no pilot is going to eject in those, because  
11 they are really steep. And if you end up in a  
12 parachute, you are liable to fall down the cliff and  
13 break your neck.

14 So the Cedar mountains are probably not  
15 going to be visible. So off to my left I have some  
16 mountains. How close am I? Well, if you are in Salt  
17 Lake City and you look at the mountains, how close  
18 were you? It is kind of hard to tell, visually. They  
19 are pretty big mountains.

20 So how far am I away? All I have, really,  
21 any significant reference to is Michael Army Air  
22 Field. And that means that anywhere in the north of  
23 Skull Valley, I'm going to be pointed within a mile of  
24 either side of the PFS site.

25 So we have a little two mile airway right

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1 then. And now you are asking a pilot, who has  
2 demonstrated over, and over, and over again, that he  
3 wants to land the airplane, and he wants to get the  
4 engine restarted, and he isn't worried about avoiding  
5 anything.

6 And now we are trying to conclude that,  
7 well, he does have some general situational awareness,  
8 and therefore he would avoid it. And I would argue,  
9 how? Give me a tool, give me a reason as to the  
10 capability of information that we are going to give  
11 that pilot to avoid the PFS site.

12 When they have clearly demonstrated, over  
13 50 percent of the time, that they are not doing a good  
14 job of just ejecting when they are supposed to.

15 JUDGE LAM: Thank you, Col. Horstman.

16 CHAIRMAN FARRAR: Col. Horstman, you  
17 mentioned looking for landmarks, the other day, when  
18 you were flying into Salt Lake City. Were you landing  
19 from the south when you --

20 THE WITNESS: From the west. I was flying  
21 eastbound over -- let me get a map and show you.

22 CHAIRMAN FARRAR: Yes. Do you come pretty  
23 much down the interstate?

24 THE WITNESS: You do until you are 35  
25 miles out of Salt Lake City. If you are landing

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1 north, and you turn to about, I think it is a 1/50  
2 degree heading, which on this map approximately --

3 CHAIRMAN FARRAR: Are the only commercial  
4 airline runways north/south, isn't there an east/west?

5 THE WITNESS: No, sir, just north/south.

6 CHAIRMAN FARRAR: Just north/south, okay.

7 THE WITNESS: And there are three. Two of  
8 them are essentially 3/4, and then one of them is 3/5.  
9 So there is three runways, one is used for smaller  
10 aircraft, and the other two are used for larger  
11 aircraft.

12 CHAIRMAN FARRAR: Okay.

13 THE WITNESS: So we flew approximately  
14 halfway -- the intersection of the latitude are the  
15 blue lines here, whatever those blue lines represent.  
16 That is about what we flew over, headed eastbound. And  
17 I'm on the right-hand side of the airplane.

18 So I'm looking down --

19 MR. SILBERG: I'm sorry, I couldn't see  
20 where you were pointing.

21 THE WITNESS: Two-thirds of the way down  
22 what is described as Salt Flat on this map, or --

23 MR. SILBERG: Above Sevier B, halfway  
24 between the Sevier B border and I-80?

25 THE WITNESS: Yes. What looks to be on

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1 this map, without the right scale, maybe three miles  
2 northwest of the 6,048 foot peak that we've discussed  
3 before.

4 CHAIRMAN FARRAR: So let me make sure I  
5 get this. You came in the interstate 35 miles west of  
6 the airport you turned to a heading of 150, then when  
7 you get to the runway, the runway center line  
8 extended, you turn left, is that what happens?

9 THE WITNESS: Essentially. You have to  
10 lead the turn, otherwise you overshoot it. Yes,  
11 fundamentally that is correct.

12 CHAIRMAN FARRAR: Okay.

13 THE WITNESS: It typically would take you  
14 on another little turn to make sure that you are  
15 sequenced in with the southerly arrival traffic.

16 MR. SILBERG: Which direction were you  
17 flying when you crossed over the mud flats, east to  
18 west?

19 THE WITNESS: East to west at 17,000 feet.

20 MR. SILBERG: Thanks.

21 THE WITNESS: Actually descending from 17  
22 to 13,000 feet.

23 MR. TURK: And which day was this?

24 THE WITNESS: Last Wednesday.

25 MR. TURK: Time?

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1 THE WITNESS: I don't know, I was coming  
2 home.

3 MR. SILBERG: West to east?

4 THE WITNESS: Eastbound, west to east,  
5 yes.

6 MR. TURK: Morning?

7 THE WITNESS: Late afternoon.

8 CHAIRMAN FARRAR: And just so the record  
9 will be clear, when Col. Horstman a few minutes ago  
10 was demonstrating overcast, he threw a large white  
11 towel over the plastic tile that is covered by  
12 styrofoam cups.

13 THE WITNESS: And I would add that it is  
14 owned by Doubletree.

15 CHAIRMAN FARRAR: We didn't want to know  
16 that.

17 THE WITNESS: I will give it back.

18 CHAIRMAN FARRAR: And the towel, of  
19 course, covered everything.

20 All right, if that concludes the  
21 demonstration, go ahead, Mr. Soper.

22 MR. SOPER: Thank you, Your Honor. Your  
23 Honor, could I ask that we get out State exhibit,  
24 similar to this, that has the flight path to Michael  
25 Army Air Field? I'm trying to think of the number.

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1 Would that be available here today? It is a --

2 MR. SILBERG: Whose exhibit, one of ours?

3 MR. SOPER: I'm trying to get the exact  
4 number here.

5 CHAIRMAN FARRAR: It was a large mounted  
6 exhibit?

7 MR. SOPER: Yes. It is this map with the  
8 route embossed, or overlaid -- 186, would that happen  
9 to be available?

10 CHAIRMAN FARRAR: That was introduced in  
11 Salt Lake?

12 MR. SOPER: Yes. If it is a problem, that  
13 is okay.

14 CHAIRMAN FARRAR: We are just trying to  
15 recall what we physically did with our belongings in  
16 Salt Lake.

17 MR. GAUKLER: We have a copy, Your Honor.

18 CHAIRMAN FARRAR: Thank you, Mr. Gaukler.  
19 Mr. Soper, how big was that, was the original?

20 MR. SOPER: I think it is probably just  
21 like this.

22 CHAIRMAN FARRAR: Just that big, okay. I  
23 was recalling something as big as --

24 MR. SOPER: Actually I thought it was  
25 bigger than this myself.

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1 CHAIRMAN FARRAR: We have a copy here.

2 MR. SOPER: I thought that we might just  
3 follow-up Judge Lam's question.

4 BY MR. SOPER:

5 Q Lt. Col. Horstman, in the event that a  
6 pilot were having an experience in engine failure, or  
7 trying to reach Michael Army Air Field, or at least  
8 point in that direction, in the hopes that maybe after  
9 the engine restarted he could reach it; subsequently  
10 decided to maybe simply point towards the Stansbury  
11 mountains, in fact there could be various dangers in  
12 doing that.

13 First of all, you wouldn't be able to  
14 reach the Stansbury unless you were around three miles  
15 from it, depending on your altitude, you might even be  
16 lower than that by then?

17 A It depends on your parameters. If you  
18 lost an engine and decided to go straight to the  
19 Stansburys, and you were near them, you could make it.  
20 And we could run some calculations to figure how far  
21 it would be.

22 Q Well, the first effort by a pilot, on  
23 losing the engine, would probably be to point towards  
24 Michael, is that correct?

25 A Well, in the data base we've looked at

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1 more than 50 percent do that, in fact.

2 Q And in the case of Skull Valley, the pilot  
3 might find himself within the yellow cones shown on  
4 State exhibit 186?

5 A I believe that is exactly where he would  
6 find himself.

7 Q And so it would be some point later on, in  
8 the emergency, that upon realizing he was not going to  
9 make it to Michael Army Air field, that in the event  
10 that he turned around at that point, and pointed  
11 towards simply the mountains, might there be other  
12 things that would be in the way of such an attempt  
13 without being able to see the ground?

14 A If you are gliding an aircraft, hoping the  
15 engine is going to restart, and you realize after one  
16 or two attempts it is not going to, if you turn the  
17 aircraft that is going to take time and energy, and  
18 you are going to continue to descend.

19 And your thought process would be, as we  
20 discussed, gosh I have to restart it, I have to  
21 restart it. And in most of these cases I have to  
22 restart it until it is way too late.

23 But at some point in time the pilot would  
24 transition, we hope, to I'm going to eject, and it is  
25 a completely different mind set. You are no longer

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1 trying to save the aircraft, you are trying to get rid  
2 of the aircraft and trying to save yourself.

3 Where that happens is widely variable,  
4 depending on the pilot actions. And in many times,  
5 like with Frank Bernard, it was when he entered the  
6 weather about 500 feet above the ground.

7 So your ability to turn the aircraft in  
8 this glide is limited. Because when you add bank  
9 angle you lose vertical lift, and your sink rate  
10 increases. So if there is any weather around you are  
11 going to descend more rapidly through that weather.

12 And we talk about a pilot aiming towards  
13 the mountains to eject, by no means are we inferring  
14 that the pilot is trying to eject in the mountains.  
15 If you eject in the Stansburys, that is really very  
16 rugged terrain, not walkable. I mean it is serious  
17 steep mountains.

18 Now, the Cedar mountains, which are  
19 relatively mild mountains compared to the Stansburys,  
20 if the pilot pointed his aircraft to those, which is  
21 relatively in line with the PFS site, the aircraft  
22 could go and essentially hit the mountains, and those  
23 aren't as steep, so there would be less impact, or  
24 less danger to the pilot.

25 But as the other pilots have testified,

1 given all things being equal, and lots to choose from,  
2 they want flat land, the "Beautyrest" was the quote.  
3 So pointing towards the mountains and ejecting over  
4 the mountains are two very different things.

5 If you are aimed towards Michael Army Air  
6 Field, those hills can be considered mountains, by  
7 some. So I'm not sure if that answers your question.  
8 But I would never try to eject over the Stansburys.  
9 And I wouldn't hesitate to eject over the Cedars.

10 Q Referring to, again, to PFS exhibit 245,  
11 which is the weather observations, I believe you  
12 mentioned that a pilot flying in Seveir B MOA, which  
13 has an upper limit of about 5,000 feet --

14 A Yes.

15 Q -- even if you are flying at the 3 to  
16 4,000 foot level, which we have said to be common, a  
17 pilot who zooms will zoom, I believe, you said into  
18 the above 5,000 foot area?

19 A Yes.

20 Q So that the set of observations for 5,000  
21 to 14,000 foot would become relevant to a pilot who  
22 is, in fact, flying several thousand feet below. In  
23 other words, at 3 or 4,000 feet?

24 A Absolutely.

25 Q Because his zoom would take him out of the

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1 Sevier B MOA into the upper altitudes?

2 A That is correct.

3 Q And it appears that those conditions are  
4 more likely to be cloudy in all respects, either  
5 overcast, broken, or scattered?

6 A Yes, sir. And keep in mind that this does  
7 not address visibility. This is just one of the two  
8 components for flyable VMC weather.

9 Q Let me move to a different subject just  
10 for a moment. The safety training video, Col.  
11 Bernard's ejection, is that the -- does that depict  
12 the type of emergency that could occur in Skull  
13 Valley?

14 A Well, it could. An engine failure can  
15 happen anywhere. According to the current thoughts,  
16 any engine failure is considered a Skull Valley type  
17 event. There are things that happened in there that  
18 would not happen in Skull Valley.

19 But the vast majority of what happened on  
20 that tape would and do routinely occur in Skull  
21 Valley. And I would like to break those down.

22 One of the comments that I heard is that  
23 there is a very high stress level, this is air to air  
24 combat, this is really, really busy. And to you all  
25 that is correct.

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1                   And I'm not saying it isn't stressful, but  
2 I'm saying it is routine stress for a pilot. For most  
3 of you a G-warmup would put you to sleep. For a  
4 typical fighter pilot that flies 200 hours a year,  
5 this is busy, but it is not abnormal.

6                   Getting all of the extraneous radio calls  
7 sorted out seems to take a lot of time when people  
8 listen to the audio portion of the videotape. But  
9 there clearly is chaos that wouldn't happen in Skull  
10 Valley.

11                   What would happen in Skull Valley? Would  
12 you fly in a formation of four aircraft? Yes. Would  
13 there be lots of radio calls supporting that four  
14 ship? Yes. Would you shoot down an F-5? No, but  
15 every time as the flight lead would shoot down an F-  
16 16.

17                   Because as I discussed previously, during  
18 the G-warmup the pilot started out in front, and has  
19 never had an opportunity to test his radio, his  
20 infrared missile, or any of his other weapons  
21 performance systems.

22                   So if we did a 90 degree in-place G-warmup  
23 to the left, and I was in the right, every time I did  
24 that, I lock my wing on the radar, I uncage my M-9,  
25 and I shot it, then I evaluated it in the debrief.

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1                   So that is a very normal occurrence. The  
2 Gs that were used at the onset of Gs were perfectly  
3 normal with a G-warmup. When the engine failed he was  
4 in what appeared to be a relatively stable regime of  
5 flight.

6                   So while we instinctively want to put this  
7 as a special high stress, special in-flight category,  
8 the vast majority of what is going on with respect to  
9 the pilot and the airplane is perfectly normal, every  
10 day occurrence in Skull Valley.

11                   The extra radio calls, and the focus of  
12 his attention are not. But the vast majority of it  
13 is. PFS, according to the way they calculate, would  
14 say that this is an able to avoid, that this pilot has  
15 the ability to avoid the PFS site.

16                   And I watched that tape, and I don't  
17 agree. He doesn't have the ability, because he is not  
18 focused on doing it. So merely having the time and a  
19 flyable airplane, we've demonstrated, does not give  
20 you always the capability to avoid an object in the  
21 ground.

22                   He didn't make the decision to eject until  
23 500 feet, comes out of the clouds at 170 feet and  
24 ejects. I mean, that to me, and everybody else,  
25 sounds kind of ludicrous. Sounds ludicrous to him, he

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1 can't believe he did it.

2 And yet here is a highly experienced  
3 fighter pilot, who has done a Maple Flag Mission, he  
4 has ejected before, he has been highly trained, and he  
5 is making these mistakes.

6 Q Do you know how many years Col. Bernard  
7 had been flying previous to this ejection?

8 A At least 15. And he told me, and I don't  
9 recall, but a long, long time.

10 Q And this is --

11 A One of the most highly experienced fighter  
12 pilots in the world.

13 Q And this is his second ejection?

14 A Yes, it is.

15 Q And after he disengaged from the training  
16 he was doing, did he then just become an F-16 pilot  
17 with engine failure, the same as most other  
18 circumstances in which an engine failure would occur?

19 A Yes, except he kept responding to other  
20 flight members, as opposed to solving his emergency.  
21 But as far as the flyable part of the aircraft, yes,  
22 his mind set was still on something else. He was task  
23 saturated, obviously, trying to figure out what was  
24 going on with the engine, as he mentioned in the  
25 videotape.

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1                   He attempted to do a brake turn, which is  
2 not possible at a lower speed, like 200 knots. So  
3 most of those things are perfectly normal for an  
4 emergency, and we deal with those things in the  
5 simulator training, regularly.

6                   What he failed to do is, what we are  
7 finding is to be pretty typical, at least in the  
8 accidents we are looking at, he failed to transition  
9 from whatever phase of flight he was in, to the  
10 emergency phase of I have to eject.

11                   He didn't do it above 2000 feet, he didn't  
12 do it above 1,000 feet, and he had a number of  
13 activities that he should not have been doing before  
14 he ejected. He wasn't focused on ejecting.

15                   Q       Now, he had a number of activities other  
16 than, even after he disengaged from the combat  
17 training?

18                   A       Absolutely, and you always would. And the  
19 number one is trying to get that engine restarted so  
20 that you can go home.

21                   MR. SOPER:   That is all we have, thank  
22 you.

23                   CHAIRMAN FARRAR:   Thank you, Mr. Soper.  
24 Let me ask a question, Col. Horstman, something you  
25 just said suggested to me.

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1 All of a sudden it seems that you guys,  
2 and I mean you when you were in the Air Force, you  
3 break all these, no matter how good the training is,  
4 you are breaking these rules when you get into  
5 trouble.

6 Is it because you are also good, or think  
7 you are so good, and that is the kind of mentality it  
8 takes to do what you do? That failure is not  
9 something you can readily accept, and so you stick  
10 with it? And these may be characteristics that make  
11 you great fighter pilots when everything is working,  
12 but set you up, psychologically, not to do the right  
13 thing when the plane stops working?

14 THE WITNESS: Your Honor, I fundamentally  
15 agree with that. I think most fighter pilots, when  
16 they are in the airplane think they are great, not  
17 good. They are very comfortable in their air  
18 conditioned cocoon.

19 They are used to employing ordinance and  
20 killing enemies, and going to combat, and then going  
21 home. They do make mistakes, but their training is  
22 exceptional, it is the best in the world, at least  
23 that I have ever seen.

24 They do wonderful things for our nation.  
25 And yet it appears, based on all these accidents that

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1 we are looking at, that they make some gross  
2 judgmental errors when things occur that they can't  
3 control.

4 And let me give an example. If I've made  
5 a mistake, and I have a MIG on my tail, I can still  
6 control that. I can guarantee he won't shoot me down.  
7 I may not be able to shoot him down, but I guarantee  
8 we will disengage and he will not shoot me down.

9 With an emergency I'm no longer in control  
10 of the destiny of my aircraft. And most of this  
11 apparently are not translating that into I have to do  
12 this other type of activity now, because we hate the  
13 simulator. It is like going to the dentist.

14 The worst day of my life, every year, was  
15 getting my emergency procedures simulator check ride.  
16 We hated it, you studied for it, it was miserable. So  
17 you are sprung-loaded to not wanting to deal with it.  
18 And you are also sprung-loaded to I can fix this, I  
19 can get out of this situation.

20 So hopefully that answers at least part of  
21 it.

22 CHAIRMAN FARRAR: Understood the question  
23 perfectly, thank you.

24 Mr. Soper, I think you just said you were  
25 completed?

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1 MR. SOPER: Yes, thank you.

2 CHAIRMAN FARRAR: Thank you. Mr. Gaukler,  
3 are you prepared to --

4 MR. GAUKLER: Can we take about a 10 to 15  
5 minute break?

6 CHAIRMAN FARRAR: Right, and then we will  
7 do cross on everything except the 59 --

8 MR. GAUKLER: That is my thought right  
9 now.

10 CHAIRMAN FARRAR: -- reports. We need the  
11 rest of the day to do that, excluding the 59 reports,  
12 or should the Staff be also getting ready to do their  
13 cross?

14 MR. GAUKLER: We may not need all the rest  
15 of the day to do that.

16 CHAIRMAN FARRAR: Okay. And before we  
17 break let's assume that you and the Staff finish your  
18 cross of Col. Horstman today.

19 MR. GAUKLER: Except for --

20 CHAIRMAN FARRAR: Except for the 59  
21 reports, and we would need some time tomorrow morning  
22 to do that. Mr. Soper, you have no other rebuttal  
23 evidence, correct?

24 MR. SOPER: No, I don't, Your Honor.  
25 Something may occur to me.

1 CHAIRMAN FARRAR: But no other witnesses,  
2 I mean, this is your rebuttal. So if we took a couple  
3 of hours tomorrow morning, then we would put on the  
4 Staff rebuttal panel, then Mr. Gaukler you would want  
5 to put on your panel again to do rebuttal of this?

6 MR. GAUKLER: As a matter of fact it may  
7 be more efficient to do it that route, as opposed to  
8 cross examination. Yes, definitely.

9 CHAIRMAN FARRAR: So you might shorten  
10 your cross and --

11 MR. GAUKLER: Either that, or do one of  
12 the other. It will be a combination of both, but I  
13 wouldn't envision duplicating in cross what I do on  
14 rebuttal.

15 CHAIRMAN FARRAR: All right.

16 MR. GAUKLER: By and large.

17 CHAIRMAN FARRAR: Ms. Nakahara when is the  
18 official State airplane leaving?

19 MS. NAKAHARA: Six ten.

20 CHAIRMAN FARRAR: So we had hoped, I think  
21 our original target was finish by 3, but then we  
22 thought we would finish by noon. We aren't finishing  
23 by noon.

24 MR. GAUKLER: We are not going to finish  
25 by noon.

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1 CHAIRMAN FARRAR: Then let's keep in mind  
2 how we can finish by 2 o'clock tomorrow. Is that  
3 okay, Mr. Gaukler, you said you needed 10 minutes? We  
4 will give you 15. We will come back at 10 of.

5 (Whereupon, the above-entitled matter  
6 went off the record at 3:36 p.m. and went  
7 back on the record at 3:51 p.m.)

8 CHAIRMAN FARRAR: They claimed to have  
9 seen counterband, food and drinks in the court room.  
10 I responded that because of the scattered clouds and  
11 ground fog I hadn't seen anything. I was sure when  
12 the ground fog had lifted and the visibility was  
13 improved we would not see any.

14 JUDGE LAM: And they were never here. I  
15 would like to ask Lt. Colonel Horstman a general  
16 question before the party has the opportunity to  
17 examine him. Lt. Colonel Horstman, you have a  
18 distinguished military career, didn't you?

19 LT. COLONEL HORSTMAN: Yes sir.

20 JUDGE LAM: General Jefferson, General  
21 Cole and Colonel Fry also have a distinguished  
22 military career.

23 LT. COLONEL HORSTMAN: Yes sir.

24 JUDGE LAM: Now before us I see two  
25 diametrically different testimonies on the same set of

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1 data of 59 accident events. General Jefferson,  
2 General Cole and Colonel Fry, their analysis indicate  
3 all I repeat each and every one of these events all of  
4 them they classify as able to avoid. Your latest  
5 analysis in the State Exhibit 223 I see you know label  
6 all 59 events as not being able to avoid.

7 LT. COLONEL HORSTMAN: That's correct.

8 JUDGE LAM: Now my question to you is do  
9 you have an opinion as to what contributed to such a  
10 dynamic difference in interpretation by two different  
11 teams of experts on the same set of data.

12 LT. COLONEL HORSTMAN: We are trying to  
13 examine the accident reports and find specific  
14 instances where pilots behaved in the manner in which  
15 we are predicting they will. We didn't find anything.  
16 They are trying to do the opposite by inference since  
17 they didn't intentionally point somewhere then it's  
18 okay. They're going to miss it.

19 We're approaching it from fundamentally  
20 different view points. I believe that they will have  
21 a high probability of accuracy in predicting this. If  
22 you are looking at all of the accident investigations  
23 we ought to find a bunch of accidents that will lead  
24 you to believe through existing situations and  
25 scenarios that a pilot would be able to and

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1 demonstrate the ability to avoid a site such as a PFS.

2 I can't find anywhere that's the case.  
3 Maybe we need 5,000 accidents. I don't know but we  
4 are trying to show that there's no demonstrated proof  
5 to what they asking.

6 JUDGE LAM: Could the truth be somewhere  
7 in between instead of their asserting absolutely yes  
8 on all 59 events and your asserting --

9 LT. COLONEL HORSTMAN: I'm absolutely sure  
10 it is. Because we don't have a specific instance of  
11 where a pilot avoided in this kind of scenario that  
12 doesn't mean it won't happen. As we've discussed many  
13 times before given the opportunity, given the time,  
14 given the weather, in the right set of circumstances  
15 I'm convinced that every Air Force pilot and every  
16 Navy pilot and every Marine Corps pilot would in fact  
17 attempt to avoid the site.

18 However where is that number? Is it zero  
19 percent? Is it 100 percent? We think it's zero.  
20 They think it's 100 percent. So when you go to  
21 evaluate that I look at it and say I'm not trying to  
22 disprove a negative. I'm trying to prove a positive.  
23 It's much harder threshold to cross. And we find  
24 nowhere in there an example to support their claim.  
25 We find examples of pilots avoiding things and we find

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1 all kinds of examples of terrible mistakes.

2 So to assume that all fighter pilots are  
3 wonderful and perfect and they will always do the  
4 right thing, half the time they don't. We've seen  
5 that for whatever reason. I'd like to think that all  
6 those fighter pilots have lived and they have learned  
7 from their lessons. We're pretty tough on each other  
8 with it comes to these type of activities.  
9 Nevertheless as I look through these trying to support  
10 a claim that a pilot will have all of those variables  
11 lined up perfectly, I don't have any in the entire  
12 database of Access that we've been looking at to  
13 support their claim.

14 JUDGE LAM: Thank you, Lt. Colonel  
15 Horstman. I appreciate it.

16 CHAIRMAN FARRAR: Go ahead, Mr. Gaukler,  
17 when you are ready.

18 MR. GAUKLER: Thank you.

19 CROSS EXAMINATION

20 BY MR. GAUKLER:

21 Q Lt. Colonel Horstman, starting with  
22 Colonel Bernard's training tape, you agree that there  
23 are certain things in the tape that would not be  
24 typical of a Skull Valley type of event in terms of  
25 whether a pilot would avoid a site or what a pilot

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1 would do in the event of engine failure in Skull  
2 Valley, correct?

3 A No, I think I said that there were things  
4 that happened in that sequence of events that would  
5 not happen in Skull Valley normally. But I didn't  
6 make that inference.

7 Q You said there were things that happened  
8 in that sequence there that would not happen in Skull  
9 Valley, correct?

10 A That is correct.

11 Q But I thought I heard you say that  
12 shooting an F-15 or an F-5 would be something that  
13 could happen in Skull Valley, a mock shooting on an F-  
14 15.

15 A You do the same maneuvers when you are  
16 doing a G-1 mock if you haven't caged a missile,  
17 uncaged a missile, used your radar, shoot the missile  
18 to make sure that all that works. On a typical G-1  
19 warm up since I'm the leader and haven't had anybody  
20 behind me that's when I do it. So I do that same  
21 maneuver.

22 Q But you are telling me that it's the mock  
23 combat on the air range is basically the same as  
24 lining up on your wingman flying down Skull Valley?

25 A No, I'm not saying that at all. I'm

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1 saying that clearly the stress was higher but the  
2 physical activities that they were doing were  
3 relatively the same.

4 Q But isn't it true for example that you  
5 also say the G-values were similar? I think I heard  
6 you say that. Isn't true on the training tape that  
7 the G-values went up to at least 6 G at one point in  
8 time?

9 A Yes, what you would expect in a G-warm up.  
10 A typical G-warm up is four to six and then five to  
11 six for --

12 Q I thought your testimony says three to  
13 four as I read your testimony.

14 A The first one can be three to four and  
15 there's a range.

16 Q Having you done any timing on the Bernard  
17 tape in terms of determining how long he was involved  
18 in mock combat type of activities?

19 A We can't pull that from the tape because  
20 the tape doesn't start until when he's almost done.

21 Q The tape doesn't start until he's almost  
22 done.

23 A He's been airborne for 45 minutes.

24 Q Let me rephrase my question. From the  
25 onset of the engine failure that he experienced, have

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1 you determined how long he was involved after the  
2 onset of engine failure with mock combat type of  
3 activities?

4 A I don't have a second example so no I have  
5 not calculated that.

6 Q You have not done that.

7 A No.

8 Q But you would agree that clearly part of  
9 it was involved in mock combat activities.

10 A Clearly.

11 Q And also I think there was another type of  
12 movement referred to in the tape where he was doing  
13 the break move to avoid an enemy plane. Again that  
14 would be part of mock combat type of activity.

15 A It would be. He attempted to. He was  
16 unable to because of his air speed. That is not  
17 something you would normally see called at that part  
18 of Skull Valley. It would be later in the mission.

19 Q He did make an attempt to make that turn,  
20 correct?

21 A He tried to and slopped out.

22 Q And he would have lost energy in trying to  
23 make that correct right turn.

24 A Absolutely.

25 Q And he would have also lost energy in the

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1 various maneuvers he did in shooting down the F-15 I  
2 think it was.

3 A Yes, he was losing energy regardless of  
4 what he did. The more aggressively he maneuvered the  
5 aircraft --

6 Q The more energy he lost.

7 A That's correct.

8 Q Turning to your simulation, you had in  
9 your simulation a steerpoint, correct? Then you would  
10 look in the steerpoint on the hypothetical refinery  
11 facility.

12 A Yes.

13 Q And if I recall, correcting your  
14 steerpoint was tracking that facility, correct?

15 A That's correct.

16 Q And if I remember your statement you  
17 either fly directly towards your steerpoint or you  
18 could fly not towards your steerpoint but the  
19 steerpoint arrow would still show where the steerpoint  
20 was.

21 A That's correct. If the steerpoint was  
22 outside the HUD field of view there would be a locator  
23 line that gave you the direction.

24 Q Of where the steerpoint would be.

25 A Yes.

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1 Q So for example in your simulations where  
2 you showed the refinery going out below the HUD or  
3 below the dashboard as you referred to it with  
4 Counsel, the steerpoint would still show there where  
5 the hypothetical refinery was, correct?

6 A Yes sir. The closer you got there would  
7 be that same locator line.

8 Q Right. So the steerpoint would still show  
9 where the facility was on the HUD.

10 A If you had it selected.

11 Q If you had it selected. Right.

12 A Yes sir.

13 Q So at least in your simulation the fact  
14 that the facility went below and out of sight and  
15 didn't affect your knowledge where the facility was  
16 because your steerpoint would still show where the  
17 facility was.

18 A That's correct. If you had that selected  
19 as a steerpoint you should still have the heads-up  
20 display information available.

21 Q Do you have Exhibit 245? That's the PFS  
22 exhibit, the weather one you were talking about  
23 yesterday and you had talked with Counsel today.

24 A Yes sir.

25 Q I just want to make sure I understand what

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1 you were saying with respect to 245. First of all you  
2 were accepting the fact that 245 shows that there is  
3 no clouds below 5,000 feet AGL 79 percent of the time,  
4 correct?

5 A That's correct.

6 Q And yet I thought I still heard you say  
7 that 50 percent of the time weather is going to be  
8 upon you although 79 percent of the time you have no  
9 clouds whatsoever below 5,000 feet AGL which involves  
10 a good majority of flights through Skull Valley are in  
11 severe B which would be 5,000 feet.

12 A That's what I said, yes.

13 Q You said 50 percent of the time weather  
14 would still be a problem.

15 A That's correct.

16 Q Why did you say that?

17 A Because if you're at 4,000 feet and you  
18 lose an engine and you zoom you're going to go up to  
19 about 7,000 or 8,000 feet AGL getting into the second  
20 block of weather category. If you look at the  
21 Michael's Army Air Field data that we've looked at  
22 before and this, there's clouds 50 percent of the  
23 time. Sometimes they're few. Sometimes they're  
24 scattered. Sometimes they're overcast.

25 We also know based on the previous

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1 climatological data that visibility plays a fact in  
2 this also in that this is only one of two indicators  
3 of the weather conditions.

4 Q Several things on that. Are you saying  
5 that we have not considered visibility at PFS?

6 A It's not in this chart.

7 Q Isn't it true that PFS has presented other  
8 weather data information on visibility?

9 A There has been some presented, yes.

10 Q Isn't it true that that was part of the  
11 revised addendum to the air crash report which is part  
12 of PFS Exhibits?

13 A Yes sir. I remember that document.

14 Q You say that the cloud layer above 5,000  
15 feet is relevant because you would zoom up into it.  
16 Isn't it true you and I had a long discussion in May  
17 I think it was where you specifically said that you  
18 would not zoom up into clouds?

19 A That's correct. And you would not zoom up  
20 into clouds. But if they are few or scattered or  
21 broken you can go between the clouds as Colonel Fry  
22 had pointed out. I would not zoom into clouds.

23 Q You would not zoom into an overcast,  
24 correct?

25 A That's correct.

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1 Q You would only zoom up if you could  
2 maintain visual sight, the VMC.

3 A If I maintain VMC that's correct.

4 Q Which has certain rules in terms of  
5 visibility and clouds, correct?

6 A That's correct.

7 Q And those rules are designed with respect  
8 to allow you to fly visually, correct?

9 A That's correct.

10 Q So you are not suggesting therefore that  
11 a pilot would zoom up into clouds I take it.

12 A No, I'm not suggesting that at all.

13 Q Therefore if there were clouds above him  
14 at 5,000 feet I think we went through different  
15 scenarios that he would zoom as far as he could go and  
16 then continue --

17 A I'm not suggesting that at all. If you  
18 are at 4,000 feet AGL and there's clouds at 4,500 feet  
19 AGL, solid overcast, I would not climb, zoom into  
20 those clouds.

21 Q If there were clouds at 5,000 AGL you may  
22 zoom 500 to 800 feet.

23 A It would be a very brief moment.

24 Q But you would do that.

25 A Yes I would.

1 Q I think I remember your testimony  
2 correctly. You believe in those type of circumstances  
3 a pilot would have the time and opportunity to avoid  
4 the PFS site, correct, as we discussed previously in  
5 your testimony?

6 A Based on that weather I do.

7 Q I thought I also heard you say that you  
8 believe in the weather demonstration up here that you  
9 can't see the ground in an overcast situation.

10 A If it's overcast then 8/8s of the sky is  
11 covered in cloud. That appears to be 100 percent.

12 Q That's not true if you are flying under  
13 the overcast though, is it?

14 A No, if you were underneath it you could  
15 see it.

16 Q Right. So you are not suggesting that  
17 everything there's 8/8s of overcast conditions that a  
18 pilot would not be able to see the ground because he  
19 could be flying under the overcast, correct?

20 A No I'm not suggesting that but the common  
21 practice is if there's 8/8s overcast below 5,000 feet  
22 that overcast is probably going to be 1,000 feet thick  
23 or greater so there would be very little utility to  
24 fly underneath it in Skull Valley and it would be  
25 whole lot easier to fly it from the Severe D MOAs

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1 which is our common practice. So in that case I  
2 wouldn't fly underneath it. I would fly over it. And  
3 it would be undercast completely beneath me.

4 Q Then you would be in the situation that  
5 Colonel Fry was talking about in terms of having your  
6 instruments, etc. to help you determine where the PFS  
7 site is, correct?

8 A If the site is selected as a steerpoint  
9 that would help.

10 Q But even if the site weren't selected as  
11 a steerpoint you would still have an idea where the  
12 PFS site was as described by Colonel Fry.

13 A You would have a general idea, yes. I  
14 agree with that.

15 Q You also with respect to State Exhibit  
16 222, the map.

17 A The map of the image.

18 Q The image.

19 A Okay.

20 Q You were talking in terms of contrast and  
21 being able to see things and not being able to see  
22 things. Do you know what area at the PFS site will be  
23 either concrete pads or gravel?

24 A I've read it somewhere. A good size  
25 portion.

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1 Q A good size portion, correct?

2 A Yes sir.

3 Q And you would agree that would provide  
4 contrast.

5 A I don't know. It depends on what they  
6 build it out of.

7 Q Do you believe concrete provides contrast?

8 A No not at all.

9 Q You don't think so. How about gravel?

10 A It depends on whether they mine it locally  
11 or bring it in. If it's a very light color on dark  
12 then it would create contrast. If it was rust color  
13 on rust color then no it wouldn't. It would be  
14 dependent upon essence the color.

15 Q You were also talking about the weather up  
16 here. You are saying that the FAA says it's a  
17 problem. I don't know what you are referring to.

18 A Thank you. The FAA assumes that with a  
19 broken cloud deck or overcast you can not keep the  
20 same point on the ground in sight visually for any  
21 length of time. Therefore you are required to use  
22 instrument procedures for a runway for broken and  
23 greater cloud cover.

24 Q That is the FAA's definition of ceiling,  
25 correct?

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1 A Yes.

2 Q So basically the definition of ceiling is  
3 coterminous with as you just said keeping a sight on  
4 the ground located.

5 A Continually, yes.

6 Q You were talking about the Tekoi Rocket  
7 Facility. Do you know the status of Tekoi Rocket  
8 Facility?

9 A I haven't followed it in three years.

10 Q What?

11 A I have not followed it in three years.

12 Q You don't know whether it's operating or  
13 whether there are any people there or not, is that  
14 correct?

15 A I have no knowledge.

16 (Pause.)

17 BY MR. GAUKLER:

18 Q Let me consult with my colleagues to see  
19 if they have anything else. This may tie in somewhat  
20 to tomorrow, Lt. Colonel Horstman. In response to  
21 Judge Lam's questions just before we came up, I  
22 believe you said that there are examples of pilot's  
23 aborting things, correct?

24 A Yes, that's correct.

25 Q What would those be for example?

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1 A Populated areas as an example.

2 Q Are these events in the 59 accidents  
3 reports?

4 A Yes sir they are and they are noted in  
5 there. You've noted a number of those as well and we  
6 don't dispute that they've turned away from some  
7 areas.

8 Q You also said that there were examples of  
9 terrible mistakes in the accident reports.

10 A That's correct.

11 Q Can you cite me any example of a terrible  
12 mistake that led to a pilot hitting a facility like  
13 PFSF?

14 A Now you have qualified it. A facility.

15 Q I'll strike that. Can you cite me an  
16 example of a terrible mistake that led a pilot to  
17 strike a facility on the ground?

18 A Yes, the crash in Florida when he lost his  
19 engine. He knew he couldn't make the runway, kept  
20 trying to restart it, and landed in a residential  
21 neighborhood destroying two houses, killing a child  
22 and injuring a mother.

23 Q That was because he didn't turn towards  
24 the ocean to try to make the airfield.

25 A Because of poor judgement.

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1 Q Yes, I understand but I just want to make  
2 sure I understand what you said the poor judgement  
3 was. He didn't turn towards the ocean instead of  
4 trying to make an airfield.

5 A That's correct.

6 Q Okay. But at that same point he still  
7 turn towards a less congested area when he found he  
8 had a problem, correct?

9 A That's what he stated. We don't know if  
10 there's any proof to that at all.

11 Q That's what it states in the accident  
12 report.

13 A No, I said he said he maneuvered the  
14 airplane towards a less congested area. We don't know  
15 if he was successful or not. The accident report  
16 remains silent on that. We don't know if there was a  
17 field that he was aiming and he thought it was more  
18 populated. We don't know if it was a four story  
19 building. We know that he hit a house.

20 MR. GAUKLER: We got into that more  
21 yesterday. We'll get back into the accident reports.  
22 Your Honor, I don't think I have anything else other  
23 than the Exhibit 222 it's possible I may have a  
24 question or two but it would be very few other than  
25 Exhibit 222.

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1                   CHAIRMAN FARRAR: I will reserve your  
2 right to do that tomorrow as we've discussed. But  
3 something just asked leads me to ask something. Lt.  
4 Colonel Horstman, you said in response to Mr.  
5 Gaukler's question that you didn't doubt that pilots  
6 could avoid highly populated areas. I see in your  
7 Exhibit 223 you have the footnote that says where they  
8 pointed away from a populated area toward a sparsely  
9 populated area you don't say that demonstrates the  
10 ability to avoid a specific site. Is that because you  
11 start with the assumption that they knew where the  
12 highly populated area was? Well, you tell me.

13                   MR. GAUKLER: In the case of St. Louis  
14 the pilot really didn't know. He had some help.

15                   CHAIRMAN FARRAR: In what?

16                   LT. COLONEL HORSTMAN: St. Louis. The  
17 accident were radar helped him impact in a sparsely  
18 populated area for lack of looking it up. He was  
19 trying to avoid the city of St. Louis. He didn't  
20 really know but he asked for help. The Dash-1 --  
21 Could we hold up briefly? I want to make sure I get  
22 the wording right. I might have to go to the index.  
23 I'm sorry.

24                   CHAIRMAN FARRAR: You're looking for that  
25 reference in the safety manual to avoid highly

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1 populated areas or whatever it says. It came in the  
2 first couple days of the hearing.

3 LT. COLONEL HORSTMAN: We talked about  
4 that.

5 CHAIRMAN FARRAR: Right.

6 LT. COLONEL HORSTMAN: And that is in fact  
7 what you would do because the individual who I just  
8 discussed who hit the houses in Florida I'm sure he  
9 feels awful about doing that. A highly populated area  
10 means you have an incredibility probability of that  
11 happening which is why we don't fly over them very  
12 often.

13 It gets into the definition of populated  
14 area which there is none. Sparsely population area  
15 which there is none. I think just due to their  
16 humanity the pilots would do what we've seen and go  
17 below 2,000 feet to avoid any populated areas and they  
18 miss houses and they kill themselves trying as we've  
19 seen in other things.

20 CHAIRMAN FARRAR: There was suggestion in  
21 the case from the Applicant or the Staff I don't think  
22 I'm mischaracterizing it that we should read highly  
23 populated area more broadly than that. In other  
24 words, yes there are highly populated areas like this  
25 St. Louis incident but also that meant things on the

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1 ground that we wouldn't want to hit and put people's  
2 lives at risk namely the casks. Now you just  
3 mentioned the humanity of the pilot, the pilot's  
4 conscience as it were, are you saying or not saying  
5 that it would be as important to them to miss the  
6 casks as to miss St. Louis?

7 LT. COLONEL HORSTMAN: I don't know.  
8 That's a value judgement that none of you matter. The  
9 only person who matters is the pilot of the aircraft.

10 CHAIRMAN FARRAR: Is that was your double  
11 asterisks is intended to convey?

12 LT. COLONEL HORSTMAN: Yes.

13 CHAIRMAN FARRAR: I'm trying to see how  
14 you got to the statement with the double asterisks.

15 LT. COLONEL HORSTMAN: If all of us in  
16 here agreed on a number of a population, city density  
17 or something like that, that's interesting. That's  
18 irrelevant. What's relevant is what that aircraft  
19 commander thinks that day. In my 21 years I've never  
20 had it defined. I don't think you'll ever get the Air  
21 Force to define it because then what we're going to do  
22 is a town of 400 we're not going to avoid that one.  
23 So it's a value judgement.

24 So is a nuclear cask considered the same  
25 as Salt Lake City? Well, actually you could consider

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1 it worse if you would in fact strike it. Which is  
2 easier to avoid? Salt Lake City. You don't fly over  
3 it. You intentionally avoid overflight of Salt Lake  
4 City. Now putting thousands of airplanes directly  
5 over this and saying avoid it and they don't have the  
6 tools to do that in many cases.

7 So we're putting our pilots in a situation  
8 and asking them to make a decision that we think they  
9 ought to make and they're not trained to make. The  
10 Air Force training doesn't say avoid a house. It  
11 doesn't say avoid a facility. It doesn't say avoid  
12 ground site. It says populated areas. So there is no  
13 guidance for that pilot to do that.

14 Now everyone in here and Colonel Fry would  
15 agree with me more than anyone if they knew about it  
16 they would try. But do they have the tools, the  
17 skills, the knowledge, the weather, the steerpoint,  
18 all that stuff and the answer is you don't know.  
19 Every case is different. I personally would do  
20 everything I could to avoid it. But I might not have  
21 enough information at my disposal or I might make  
22 those mistakes we've seen in over half the times which  
23 would impact my judgement in making those clear  
24 conscious decisions.

25 CHAIRMAN FARRAR: You say you would do

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1 everything possible to avoid it. Does at the last  
2 second when you're making a split second judgement is  
3 the cask rise to what's in your mind as to all the  
4 kids in the schoolyard that we've talked about earlier  
5 in the case?

6 LT. COLONEL HORSTMAN: If you can  
7 positively identify it and remember that back then the  
8 airplanes went 70 miles an hour. Now we're talking  
9 bout at least three times faster, potentially a lot  
10 faster, I don't know. I do know one thing if they are  
11 supposed to be strong enough then I wouldn't kill  
12 myself avoiding it. Does that help?

13 CHAIRMAN FARRAR: Yes. And that's in  
14 contrast to one of the reports that we had here where  
15 the fellow made it back to the parade ground and was  
16 going to land the plane and his buddies were marching  
17 out there so he died.

18 LT. COLONEL HORSTMAN: That's correct. He  
19 could see the whites of their eyes because he was  
20 going very slow and he was in an old airplane that the  
21 speed and those planes glide pretty nicely some of  
22 those old ones. When you get that close to your work  
23 are you willing to die for your friends?

24 We've been told that the casks will be  
25 okay if you hit them. They won't breach and I'm

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1 assuming that the pilot will believe that so would he  
2 die trying to avoid something that if he hit the only  
3 repercussion is rebuilding one or something? I don't  
4 know.

5 CHAIRMAN FARRAR: Okay. Thank you. Mr.  
6 Gaulker, I think you had concluded other than  
7 reserving the matters for tomorrow.

8 MR. GAUKLER: I have some further  
9 questions with respect to the Board's questions.

10 CHAIRMAN FARRAR: That always happens.  
11 (Laughter.) Go ahead because it's something better to  
12 keep everything together on the record while we are  
13 all thinking about it. Go ahead.

14 CROSS EXAMINATION (Con't)

15 BY MR. GAUKLER:

16 Q First of all, assuming that you were in a  
17 city 10 miles -- Strike that. You said something  
18 about avoiding a facility. What is your definition of  
19 a facility?

20 A I don't have a definition.

21 Q You don't have a definition. You were  
22 talking about your ability to avoid a facility such as  
23 the PFS I'm talking about having the tools, the  
24 knowledge and weather to avoid it. You referred to  
25 facilities in that context. What did you mean by

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1 facilities?

2 A I was specifically speaking to the PFS  
3 site in that case.

4 Q Let me just take an example first of all.  
5 Assume you were in that situation and you had in front  
6 of you a facility that was roughly a half mile by a  
7 half mile.

8 A A structure that was that big?

9 Q An industrial facility with wires around.

10 A So just ground.

11 Q No it would be facility with a fence  
12 around it and there would be various things within the  
13 fence.

14 A I would like to clarify. I'm on the  
15 planning commission in my town. A facility is  
16 inhabitable. It creates a shadow. So I'm unclear as  
17 to what you are specifically asking.

18 Q Let's take the PFSF.

19 A Okay.

20 Q We have a canister transfer building.  
21 That's a structure, correct.

22 A That's correct.

23 Q Within that same fence we have casks and  
24 canisters on pads.

25 A That's correct.

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1 Q We also have roughly 40 to 50 people  
2 employed at the PFSF.

3 A I don't know that but okay.

4 Q So let's assume that there would be people  
5 employed on an industrial facility, correct?

6 A Not in Utah.

7 Q You won't assume that?

8 A No. Is the Tekoi Plant operational?

9 Q Well assuming that the PFSF was  
10 operational then you would assume that people would be  
11 employed there, correct?

12 A I would.

13 Q You would or you wouldn't?

14 A I would if it was operational.

15 Q Now assume that you were flying towards  
16 the facility as I described roughly a half mile by a  
17 half mile or a third of a mile by a third of a mile,  
18 something in that range. And you also found yourself  
19 flying towards a good sized town such as Salt Lake  
20 City for example. You ran into an accident situation.  
21 Which would be easier to avoid?

22 A The city.

23 Q So if you were within 10 miles from the  
24 city and 10 miles from the PFSF and the city would be  
25 easier to avoid than the PFSF.

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1           A        Yes sir. What you described and what you  
2 asked are two different things. You talked about a  
3 facility. So I'm saying a city versus the PFSF site  
4 because 10 miles away from the PFSF site I can't see  
5 it.

6           Q        But if you're flying down the Skull Valley  
7 on a regular basis you would know that it's there,  
8 correct?

9           A        Yes but again it would easier to avoid the  
10 city. If I can expand on that, it might take a larger  
11 turn but the identification part would be drastically  
12 easier.

13          Q        Now let's say you're in a situation where  
14 you would otherwise hit something unless you turned.

15          A        Okay.

16          Q        Would it be easier to avoid that?

17          A        What are my options? What are my  
18 selections?

19          Q        Again I'm talking about this facility  
20 which I defined as a half mile by half mile, third  
21 mile by third mile something like that versus a large  
22 city like Salt Lake City.

23          A        It depended how far back assuming a  
24 perfectly clear day and all of those variables then I  
25 wouldn't get in that situation by the city. So it's

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1 hard to read that into it. It is without a doubt  
2 easier to avoid a point target than it is an area  
3 target when you are talking about a city versus 50  
4 acres as an example regardless of how big the city is.  
5 It would clearly take less maneuvering to avoid a  
6 smaller area. But that assumes that you can identify  
7 that of that area that you are trying to avoid.

8 Q Now isn't it true when you are flying back  
9 towards Huber (PH) Air Force Base you're flying back  
10 towards the city, Odgen or that general area?

11 A You fly west of Odgen.

12 Q By the city any point in time when you are  
13 flying there?

14 A Towards Odgen?

15 Q Yes.

16 A Absolutely.

17 Q Now you are saying that a pilot doesn't  
18 have the tools or the knowledge to avoid a facility  
19 like the PFSF. First of all, he has the airplane and  
20 if you are assuming he's in control of the airplane he  
21 would have a tool to avoid the PFSF, correct?

22 A Ninety-three percent of the time he's  
23 going to be based on these datapoints in control. So  
24 he has in control. He would need general situation  
25 awareness, specific situation awareness and the actual

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1 ability to locate that site. That's dependent upon  
2 what he has selected as avionics package.

3 If he's lost an engine he's going to  
4 select markers on the airfield. So now I don't have  
5 specific navigation information with respect to the  
6 site. I still have that general situation awareness  
7 and if I was on another steerpoint that was 10 miles  
8 down track I would have a reference from that. But  
9 that's a lot harder to use than it appears because now  
10 you are trying to do radio and DME and I'm four  
11 degrees off. At four degrees at 10 miles laterally  
12 how many feet is that? You know if you are on course  
13 left or right by a little or a lot.

14 Q Assuming clouds or no clouds here?

15 A I haven't gotten to clouds yet. So those  
16 are some of the tools that I would need.

17 Q But my basic question was you have one  
18 tool which is the aircraft itself if it's capable.

19 A If it's capable, yes sir it is.

20 Q Also the situation of awareness is the  
21 knowledge part of it, correct? You would have general  
22 situation awareness.

23 A You would have the first part of that  
24 which is general. Then you would need the secondary  
25 part which is finite. Assuming somehow you would get

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1 that information that would make your problem set a  
2 lot easier to solve. Weather would impact that  
3 especially if it was not selected as a steerpoint. If  
4 it was selected as a steerpoint weather would be much  
5 less of an impact.

6 CHAIRMAN FARRAR: Mr. Gaukler.

7 MR. GAUKLER: One last question.

8 CHAIRMAN FARRAR: Go ahead but you know  
9 what I was about to say.

10 MR. GAUKLER: Is this the last question?

11 CHAIRMAN FARRAR: You said it just in time  
12 because I was about out that we seem to be far afield  
13 from where my question went. Maybe it didn't start  
14 out that way but we got there and we have to keep  
15 going.

16 LT. COLONEL HORSTMAN: May I finish with  
17 that scenario?

18 CHAIRMAN FARRAR: Wait a minute. There is  
19 no question pending. You don't get to ask for an  
20 extra answer but go ahead.

21 LT. COLONEL HORSTMAN: The last part of  
22 the tools that you need is the mental capacity to  
23 focus on ejecting as opposing to saving the aircraft.  
24 In 50 percent of the time in this database we seem to  
25 have a problem doing that.

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1 MR. GAUKLER: I decided to save it for  
2 rebuttal.

3 CHAIRMAN FARRAR: No carryovers. Staff.

4 MR. TURK: Your Honor, we have a somewhat  
5 unusual request. Because of the late nature of the  
6 rebuttal testimony both Ms. Marco and I have  
7 questions. I would ask that we be allowed to ask them  
8 separately rather than consulting on each question and  
9 taking extra time involved in doing that.

10 MR. GAUKLER: I know the State did that a  
11 couple of times with some of our witnesses.

12 MR. TURK: Actually Ms. Marco is telling  
13 me that I should just go ahead and if she has anything  
14 she'll ask permission at that point.

15 CHAIRMAN FARRAR: I'm not sure I  
16 understood what you asked.

17 MR. TURK: I thought we might need to have  
18 two questioners but Ms. Marco is telling me that it  
19 looks like we can just do it with one of us. I'm not  
20 sure if she will have follow-up because we haven't had  
21 time to consult. Obviously let's go forward if we are  
22 aiming to be out of here by Independence Day or I  
23 assume thereafter is possible.

24 CHAIRMAN FARRAR: But what's unusual is  
25 that's the first time today you requested permission

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1 to do what you've been doing all day. Go ahead, Mr.  
2 Turk.

3 CROSS EXAMINATION (Con't)

4 BY MR. TURK:

5 Q Lt. Colonel Horstman, we've had testimony  
6 about weather conditions as well as conditions in  
7 which weather is not a factor. For the moment I would  
8 like to focus on situations where weather is not a  
9 factor and that is where the pilot would be able to  
10 see the ground at least sufficiently in order to be  
11 able to identify objects on the ground. We talked  
12 before about the good visibility from the canopy of  
13 the F-16. You would agree that it's a very highly  
14 visible situation in which the pilot finds himself  
15 assuming the weather conditions permit for him to see  
16 the ground.

17 A Yes sir.

18 MR. TURK: I would like to distribute copy  
19 of an exhibit, Your Honor. I would like to have this  
20 marked as Staff Exhibit 65. I think we can spare two  
21 copies for party.

22 (Whereupon, the above-referred to  
23 document was marked as Staff Exhibit No.  
24 65 for identification.)

25 MR. GAUKLER: Great. I can tell the staff

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1 was at his home office with the nice colored Xerox.

2 MR. TURK: Let me say, Lt. Colonel  
3 Horstman, that I am much impressed by the F-16. From  
4 everything I have read it seems to be a spectacular  
5 aircraft.

6 LT. COLONEL HORSTMAN: I share those  
7 views.

8 MR. TURK: I think that you and Colonel  
9 Fry in addition of being of great service to the  
10 country must be very talented pilots to be able to  
11 handle those aircraft.

12 LT. COLONEL HORSTMAN: Thank you.

13 BY MR. TURK:

14 Q With that as background I would ask you  
15 whether you have seen a book entitled The Great Book  
16 of Modern Warplanes.

17 A Yes, I've seen that and glanced through it  
18 especially the F-16 part.

19 MR. TURK: I would ask to have marked as  
20 Staff Exhibit 65 the cover page and approximately an  
21 additional 13 or 14 pages that are drawn from that  
22 book including many colored photographs.

23 MR. SILBERG: These are selected pages.  
24 They are not necessarily cumulative or consecutive.

25 MR. TURK: That's correct. The pages

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1 numbers appear on most of the pages. For the record  
2 let me indicate that the exhibit consists of the outer  
3 wrapper of the book, the table of contents and credits  
4 pages at the beginning of the book, pages 137 and 138,  
5 153, 157, 170 and 171, 188, 192, 193, 198 through 200.

6 MR. SILBERG: On our copy the last two  
7 pages don't have numbers on them.

8 MR. TURK: I have the book here if anyone  
9 wants to see the book itself. These represent pages  
10 from the book that you've indicated that you've seen.

11 LT. COLONEL HORSTMAN: Yes they do.

12 BY MR. TURK:

13 Q Now on page 137 would you agree that it's  
14 a good photograph of F-16s in formation flight lined  
15 up in a row?

16 A Yes.

17 Q It looks like there are about eight planes  
18 in that formation.

19 A Looks the same to me.

20 Q If you would take a look also at page 153.  
21 There's a photograph in the center that shows several  
22 different variations of the aircraft.

23 A Yes.

24 Q Again that shows three aircraft in flight.

25 A Yes.

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1 Q It would appear that they are somewhere in  
2 Utah. The terrain is very similar to Utah. It might  
3 be some other location but the terrain is similar to  
4 what you would find in Utah.

5 A It could be Utah or the California desert  
6 where they do test or in Nevada.

7 Q But it's a desert landscape with the  
8 mountains in the background.

9 A Yes sir.

10 Q And we can see the pilots very clearly  
11 through the canopies. In particular the first plane  
12 in the foreground shows it's a two pilot configuration  
13 or a training aircraft.

14 A That's correct.

15 Q And you can see the shoulders of the  
16 pilots of both at the point in which canopy begins to  
17 rise above the fuselage.

18 A That's correct and the glass is clear. In  
19 the operational F-16s the glass is not clear.

20 Q While we are looking at photographs in  
21 general and there are a number of photographs here.  
22 I won't ask about each of them except to identify what  
23 we are looking at. Page 188 at the bottom again shows  
24 an F-16 in flight this time located over an area that  
25 has more green space below it than you might find in

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1 the Skull Valley location, correct?

2 A That's correct.

3 Q Also if you would turn to page 193. at  
4 the top of the page there's a picture of a pilot  
5 wearing a hermit and past him you see what is several  
6 other planes in formation.

7 A That's correct.

8 Q Is that something similar to what you  
9 would see if you were flying in formation looking out  
10 of your side window, looking out the side of the  
11 canopy?

12 A From a different perspective. I've been  
13 looking from eyeballs as opposed to the camera lens  
14 but relatively similar.

15 Q But you have that very clear view off to  
16 the side without obstructions.

17 A Yes.

18 Q Just a general visibility picture, the  
19 second to the last page which would be page 199 shows  
20 an experimental version of the F-16 which is the F-  
21 16/XL but it also shows what's referred to in the  
22 caption below the photograph as the basic canopy  
23 configuration. Do you see that?

24 A Yes sir I do.

25 Q Is that pretty much what the canopy looks

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1 like on the F-16s that would be flying through Skull  
2 Valley?

3 A It appears to be the same or similar.

4 Q That gives us a sense of the visibility  
5 that a pilot has as he would look around him as he  
6 flies through Skull Valley.

7 A No, it doesn't give you any sense of that  
8 at all.

9 Q Why not?

10 A It gives you a sense of what other people  
11 would look at not what the pilot would look at.

12 Q Because in this picture we are looking at  
13 the pilot.

14 A That's correct.

15 Q But if we wanted to understand what the  
16 pilot would be looking at we almost put ourselves in  
17 his shoes and look out from his position to see the  
18 surrounding area.

19 A It's a little more difficult to do.

20 Q Okay. With respect to visibility on page  
21 192 you'll see there's a photograph of two F-16s  
22 pointing almost vertically. They are actually almost  
23 somewhat over the vertical axis.

24 A Yes.

25 Q It's next to the caption, Performance and

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1 Handling.

2 A Yes.

3 Q Then there are two captions below that  
4 photograph, one refers to the photo above the caption  
5 and there's a caption that reads both right. Do you  
6 see that one?

7 A Yes.

8 Q And it states "the superb visibility of  
9 the F-16's canopy is illustrated by this view of the  
10 aircraft from the 8th TFW." TFW is tactical fighter  
11 wing.

12 A Yes, it used to be.

13 Q Then if you look at page 193 which is the  
14 photograph that is to the right of that caption that's  
15 where we see the photograph of the pilot at the top of  
16 the page sitting in his cockpit with a number of  
17 planes located to his right.

18 A That's correct.

19 Q And that caption fairly describes. It's  
20 superb visibility, is it not?

21 A Yes it is.

22 Q On page 157 and this is the page that has  
23 the blueprint of the structure on the bottom half of  
24 the page. On the top of that page there are some  
25 textual discussion. Do you see that?

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1 A Yes.

2 Q In the first column the following  
3 statement appears. Tell me if I read correctly. This  
4 is midway down the paragraph. Do you see that?

5 A Yes I do.

6 Q "The final design meets all USAF  
7 requirements and offers a level of visibility which  
8 must leave MIG-21 and Mirage III pilots drooling with  
9 envy." Then lower down in that column it states  
10 "Visibility from the cockpit covers a full 360 degrees  
11 in the horizontal plane and from 15 degrees down over  
12 the nose through the zenith and back to directly  
13 behind a total of 195 degrees." Do you see that  
14 statement?

15 A I do.

16 Q It continues by stating "Sideways  
17 visibility extends down to a depression angle of 40  
18 degrees. The polycarbonate is 0.5 inches (1.3  
19 centimeters) thick but it's optical quality is high  
20 and the curved services offer a minimal distortion of  
21 the outside view." I read that correctly.

22 A Yes.

23 Q That's pretty much a correct  
24 representation of the F-16 visibility both in the  
25 horizontal plane and the vertical. Would you agree?

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1 A Basically.

2 Q Okay. I'd like to ask you to turn also to  
3 the bottom of page 192, the very last line of the text  
4 on that page. The following statement appears  
5 continuing on to page 193. "At relatively modest bank  
6 angles the pilot is able to look vertically downward  
7 at the terrain below --

8 A I don't see that.

9 Q Okay.

10 A I'm with you now. Excuse me.

11 Q This is the page that at the top has the  
12 bold words "Performance and Handling."

13 A Got it.

14 Q The very last line of the text on that  
15 page states "At relatively modest bank angles a pilot  
16 is able to look vertically downward at the terrain  
17 below while the absence of canopy frames in the  
18 forward field of view removes the reference points by  
19 which pilots instinctively position the horizon during  
20 normal flight." Would you agree then that at  
21 relatively modest bank angles the pilot can simply  
22 look downward and see the terrain below him?

23 A 40 degrees of bank.

24 Q Well, 40 degrees is the normal field of  
25 vision. We've already seen that in the text that

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1 we've discussed previously. I'm not talking about  
2 that 40 degrees. I'm talking about banking the  
3 aircraft --

4 A To see something directly below you?

5 Q Yes.

6 A Directly below you? It's not modest. You  
7 can bank up a little bit and see closer to you. But  
8 to see directly beneath you, it's about a 40 degree  
9 angle.

10 Q And the pilot can also move his head  
11 slightly towards the edge of the canopy to his side  
12 and that would increase the field of vision below him.  
13 Correct? It's normal physics. We all do it every  
14 day.

15 A You don't fly F-16s every day, so the  
16 answer is no.

17 Q The pilot can't move his head.

18 A The pilot can move his head approximately  
19 two inches.

20 Q Okay. In addition to being able to bank  
21 the aircraft slightly -- By the way, you can bank the  
22 aircraft without changing your flight path. Correct?

23 A Without changing your flight path?

24 Q In other words, the plane would continue  
25 in the same direction that it had been traveling

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1 before if all you were doing is banking slightly,  
2 rolling slightly over to your left or your right in  
3 order to increase your downward vision.

4 A No, sir. That's not correct.

5 Q That's not correct? Incidentally on that  
6 page 193, do you see there's a sketch of two  
7 airplanes? One has blue it looks like fields of  
8 vision drawn with respect to the visibility that the  
9 pilot has.

10 A Yes.

11 Q Then on the right, you have another  
12 aircraft with a pink field of vision. It's correct  
13 that the F-16 is the aircraft picture to the left.

14 A That's correct.

15 Q The other presumably is the MIG-21 that's  
16 referred to in the caption just below that sketch.

17 A Commonly referred to as a "target."

18 (Laughter.)

19 CHAIRMAN FARRAR: We won that war.

20 LT. COLONEL HORSTMAN: No. They're all  
21 over the world now.

22 BY MR. TURK:

23 Q If you would take a look at page 198 which  
24 is the next page in this exhibit at the top of the  
25 page there are a number of diagrams shown. This is

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1 under the caption "New Ways to Fly." Do you see that  
2 set of depictions?

3 A I do.

4 Q If you look at the very last one which  
5 would be the bottom right diagram of those six that  
6 are shown there, to me that diagram indicates that the  
7 nose of the plane -- Let's read what it states first.  
8 "Like pitch-axis pointing, yaw-axis pointing," that's  
9 Y-A-W, "allows the nose to be moved without changing  
10 the direction of flight."

11 A Would you like to know what that means?

12 Q Yes. That's not what we were talking  
13 about before. Correct? We're not banking the plane  
14 here.

15 A It's in a whole lot of bank.

16 Q I'm sorry.

17 A You have to ask a question. I'm confused.

18 Q That's not banking the aircraft. Correct?

19 A I'm assuming we're looking at it from the  
20 God's eye view.

21 Q You're looking down on the aircraft from  
22 above.

23 A That's what I'm assuming. Is that  
24 correct?

25 Q It looks to be that way to me.

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1           A     Okay.

2           Q     What seems to be happening in this diagram  
3 is the nose of the plane is being moved away from the  
4 direction of flight arrow. Although the direction of  
5 flight is continuing along the original direction of  
6 flight arrow.

7           A     That is possible. You have to use in this  
8 case you would stomp on the left rudder and fly  
9 uncoordinated with much higher drag. You'd be  
10 slipping the aircraft sideways through the air.

11          Q     So for instance if your field of view was  
12 obscured due to the nose or the wind screen or the  
13 console if a pilot wanted to see what's in front of  
14 him, he could simply stomp on that pedal as you say  
15 and look ahead for a moment and then come back to his  
16 original --

17          A     Yes, sir.

18          Q     That's correct. Yes?

19          A     It's partially correct. I will explain.  
20 If you're at 200 knots gliding and you stomp on the  
21 rudder, you're going to depart the aircraft and become  
22 uncontrollable. Your rate of descent is going to  
23 increase dramatically because the airflow over the  
24 wings is no longer laminar. Your descent rate could  
25 increase up to three times.

1 Q It all depends on how hard you stomp on  
2 that pedal.

3 A It depends on how far you want to move the  
4 nose.

5 Q Okay. If you only want to move it one or  
6 two degrees, then you wouldn't have as great an effect  
7 as you just described.

8 A That's correct. But you would still  
9 increase your vertical velocity downward. I know of  
10 no pilots who do that.

11 Q Not in their normal flight practices.

12 A In an emergency, a pilot would revert back  
13 to normal flight practices. I don't think I know  
14 anybody who would try new tricks during an emergency  
15 like this.

16 Q Unless if they're possibly trying to see  
17 where something was on the ground that they were  
18 trying to avoid.

19 A There are other ways of doing it that are  
20 a whole lot easier.

21 Q There are other ways to do what?

22 A If you're suggesting that a pilot will  
23 increase his visibility by using a rudder, I don't  
24 agree with that.

25 Q You said there are a lot of other easier

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1 ways to do that.

2 A To maneuver the airplane.

3 Q In order to increase visibility.

4 A In order to maneuver the airplane, to  
5 increase visibility, to make visibility worse, you  
6 want to fly the airplane in a coordinated flight.

7 Q I haven't heard that in your testimony.

8 A Flying an airplane and coordinating a  
9 flight gives you the most lift. In a case like this,  
10 we're talking about ejection. Any time you fly  
11 uncoordinated, you're going to lose lift and increase  
12 your rate of descent making the ejection seat less  
13 safe.

14 Q You said there were easier ways --

15 A To maneuver the aircraft.

16 Q For visibility other than stepping on that  
17 left or right rudder pedal.

18 A That's correct.

19 Q I don't know that you've described those  
20 easier ways yet. Can you do that?

21 A You can turn.

22 Q Okay. You can turn and then turn back to  
23 your original direction of flight if that's what you  
24 wanted to do. Correct?

25 A If that's what you wanted to do. If

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1 you're making a left turn or a right turn, you're  
2 losing energy as well. So you would probably not make  
3 lots of turns because again you're depleting energy  
4 when you turn the airplane.

5 Q Okay. Now, we've talked so far about  
6 visibility through the canopy. There's also something  
7 in front of the pilot. That's the heads up display.  
8 Correct?

9 A That's correct.

10 Q We talked before about the fact that you  
11 can see the ground through the heads up display.

12 A That's correct.

13 Q Could you please turn to page 171?

14 A Okay.

15 Q At the top of that page, we see what  
16 appears to be a pilot sitting inside a cockpit.  
17 Correct?

18 A Yes.

19 Q With the console fully displayed in front  
20 of him. Correct?

21 A Correct.

22 Q His hand is on the stick to the right.

23 A Correct.

24 Q Directly in front above the console, we  
25 see some sort of an apparatus that rises up above the

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1 instrumentation. That's the heads up display.

2 Correct?

3 A The top part. The bottom part of that is  
4 the F-front control.

5 Q The top part. It's the part that as you  
6 look through it seems to have open space. You're  
7 looking at what appears to be a city through the HUD.

8 Correct?

9 A That's correct.

10 Q That's what it would appear like if you  
11 were in that aircraft and you were looking through  
12 your heads up display, that would be an accurate  
13 picture of what you would see if you were coming to  
14 that position viewing whatever it is that's on the  
15 other side of the HUD. Correct?

16 CHAIRMAN FARRAR: Mr. Turk?

17 MR. TURK: Yes.

18 CHAIRMAN FARRAR: It's 5:00 p.m. on July  
19 2nd.

20 MR. TURK: Yes.

21 CHAIRMAN FARRAR: And I have to know that  
22 you're helping us learn something that we have to  
23 learn to decide this case.

24 MR. TURK: I'm helping you learn the  
25 visibility of the pilot.

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1 CHAIRMAN FARRAR: Well, that whole last  
2 series didn't help me. We heard that before. You  
3 have a book here, but I didn't learn anything in that  
4 examination that I didn't know this morning and that  
5 I didn't know a few weeks ago. It's 5:00 p.m. on July  
6 2nd.

7 MR. TURK: I have one more question on  
8 this picture and then I have one other section of this  
9 proposed exhibit that I'd like to examine. I think  
10 I'll be done with it in three minutes.

11 CHAIRMAN FARRAR: Okay. Why don't we just  
12 ask what we want to learn from him? I can see the  
13 picture, refer him to it, and ask him a question.

14 BY MR. TURK:

15 Q The only question I would ask you about  
16 this particular picture is it correctly shows that you  
17 can see through the HUD and you also can see to either  
18 side of it as you're looking to see what's in front of  
19 you on the ground or in the air. Correct?

20 A You can see through it, yes.

21 Q And to the sides of it.

22 A Yes.

23 Q Okay. If you lose an engine in flight  
24 through Skull Valley, do you still have your ability  
25 to use radar to detect ground objects?

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1 A No.

2 Q You've lost the radar.

3 A That's correct. It falls off line when  
4 the bus falls off line.

5 Q And that radar would be the LANTIRN  
6 system.

7 A No.

8 Q What is that radar?

9 A It's the aircraft radar. There's a  
10 separate system which is a pod on the aircraft called  
11 LANTIRN.

12 Q Is it the APG-68? Is that a familiar  
13 acronym to you?

14 A Yes. I believe so.

15 Q Yes?

16 A I believe so, yes.

17 Q The radar on an F-16 has ground sensing  
18 capability. Correct?

19 A I believe so, yes.

20 Q At page 170 of this proposed exhibit in  
21 the third column down, there's a description of the  
22 LANTIRN program.

23 A Perhaps I should explain. The LANTIRN is  
24 not part of the aircraft. It's a pod that you attach  
25 to the aircraft. It's not external on the chin of the

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1 intake for the engine.

2 Q Is it commonly used by the F-16s at Hill  
3 Air Force Base?

4 A Part of it is.

5 Q Part of the LANTIRN system?

6 A Part of the LANTIRN system.

7 Q So it's physically attached to the  
8 aircraft at Hill Air Force Base.

9 A Some of them are.

10 Q That LANTIRN has the ability to see with  
11 infrared vision. Is that correct?

12 A That's correct.

13 Q So that it would detect hot spots on the  
14 ground below or in front of it.

15 A That's correct as long as the main bus is  
16 powered. When you lose your engine, you lose your  
17 main bus and it no longer works.

18 Q Okay. That would be true for a pilot  
19 that's lost an engine.

20 A That's correct.

21 Q That would not be true for his wingman.

22 A That's correct.

23 MR. TURK: Your Honor, I'd like to offer  
24 this document into evidence at this time.

25 MR. GAUKLER: No objection, Your Honor.

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1 CHAIRMAN FARRAR: For what purpose?

2 MR. TURK: To show the visibility that an  
3 F-16 has, to show the discussion of the ground sensing  
4 radar capability.

5 CHAIRMAN FARRAR: Okay. We went through  
6 59 reports and all those guys who were in trouble, I  
7 didn't hear one story of one of them trying to use his  
8 radar to find something on the ground that he didn't  
9 want to hit.

10 MR. TURK: The point which Lt. Colonel  
11 Horstman just made is that a pilot of the aircraft in  
12 trouble would not have his radar, but he agreed that  
13 the wingman would. This does not go to the accident  
14 reports. This goes to whether or not an aircraft in  
15 trouble in Skull Valley would have the resource of the  
16 pilot picking up the radio or he doesn't even have to  
17 pick it up and asking his wingman where am I.

18 CHAIRMAN FARRAR: What do you use radar to  
19 find? If you're just in regular flight, what do you  
20 use this for?

21 LT. COLONEL HORSTMAN: To find other  
22 airplanes. Periodically to find a pre-planned turn  
23 point.

24 CHAIRMAN FARRAR: Do you also use it to  
25 avoid inadvertent contact with the ground, like a

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1 mountain or something?

2 LT. COLONEL HORSTMAN: No. Not at all.  
3 What's the best way to say this? If I were a wingman  
4 as experienced as I am and my leader had a problem and  
5 lost an engine, the last sensor on the aircraft I  
6 would use for any purpose is the radar because if I  
7 can find something on the ground, then I have to look  
8 at it in a radar scope, figure out where it is in  
9 reference to me, and then do the mental gymnastics to  
10 figure out where it is with respect to him. Then I  
11 would get on the radio and translate that to him who's  
12 busy trying to solve his own problem.

13 MR. TURK: Your Honor, there are other  
14 uses that the article mentions that we haven't  
15 explored. If I could ask Lt. Colonel Horstman to look  
16 at page 170, there's a discussion there of using the  
17 forward looking infrared imagery for navigation.

18 LT. COLONEL HORSTMAN: That's correct.  
19 They've taken those off the airplanes at Hill.

20 BY MR. TURK:

21 Q Hill does not have the ability to navigate  
22 with these.

23 A They don't need it anymore. This is an  
24 ancient system.

25 Q The aircraft no longer have this

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1 capability.

2 A They took the FLIR off of the aircraft.  
3 It is an additional pod that's attached to the  
4 fuselage, the engine inlet lip.

5 MR. TURK: One other point, Your Honor.

6 BY MR. TURK:

7 Q The F-16, is it not, is a air to ground  
8 weapon system.

9 A It's multi-role.

10 Q It both combats in the air as well as  
11 bombs on the ground.

12 A That's correct.

13 Q Therefore it has the ability to sense the  
14 terrain and locate objects on the ground. Correct?

15 A To sense the terrain? The radar altimeter  
16 would do that for you.

17 Q It has the ability to locate objects on  
18 the ground through one electronic means or another.

19 A Yes it does.

20 MR. TURK: Your Honor, I think the exhibit  
21 is relevant to the aircraft that will be flying in  
22 Skull Valley. We've heard that the F-16 is  
23 predominately the aircraft that will be used in that  
24 corridor. I believe the exhibit is informed, useful  
25 information about its capabilities, its strengths and

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1 the ability of a pilot to use those tools that the F-  
2 16 has in order to find his way if he does lose an  
3 engine or becomes somehow in trouble in Skull Valley.

4 CHAIRMAN FARRAR: Mr. Turk, we've had some  
5 real experts who have flown these things in the room  
6 with us for however many days we've been here on this  
7 issue. We've heard a lot of testimony. We have all  
8 these crash reports which the Applicant's people have  
9 analyzed and will analyze some more. We'll hear more  
10 tomorrow. The State's people have analyzed them.

11 The issue for us is what can you  
12 reasonably conclude from a regulatory standpoint these  
13 guys will do when they get in trouble. I've heard  
14 nothing in all of that which says any of this stuff  
15 that you've been talking about bears on that issue.  
16 Maybe this radar has some capability, but Colonel  
17 Horstman has just said it's the last thing he'd use.  
18 We find these people making mistake after mistake.

19 MR. GAUKLER: Your Honor, I would like to  
20 add one point.

21 CHAIRMAN FARRAR: You cut off my tirade,  
22 Mr. Gaukler.

23 MR. GAUKLER: I'm sorry.

24 CHAIRMAN FARRAR: Thank you.

25 MR. GAUKLER: I was going to say I

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1 definitely think the visibility stuff like the picture  
2 on 171 certainly gives you an idea of what we've been  
3 talking about in terms of the field of view of the  
4 HUD. Some of the stuff that Mr. Turk originally  
5 covered in the first part of his discussion I think  
6 ties into what Lt. Colonel Horstman was talking about  
7 earlier. He gave you some information on that. The  
8 pictures there are worth a thousand words in some  
9 respects. I think that certainly part of this  
10 document is relevant.

11 CHAIRMAN FARRAR: And what do I do with  
12 the rest of it?

13 MR. TURK: I won't refer to any of the  
14 rest other than what I've examined upon. I would note  
15 that because it does have many other paragraphs in  
16 there, I don't look to mislead the State. The points  
17 that I wanted to make are the points that I examined  
18 upon. I would note also that the State has not  
19 objected, Your Honor. Not yet.

20 CHAIRMAN FARRAR: I haven't given them a  
21 chance because we're trying to move this along and  
22 make sure that the record is properly developed. So  
23 we had our own concerns on that. Mr. Soper?

24 MR. SOPER: The State does object, Your  
25 Honor. This is a coffee table book published by

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1 Salamander Books. It's many, many pages. This  
2 witness certainly has not adopted it in full. He's  
3 indicated the pictures are pictures of what they  
4 propert to be in some cases.

5 If it were admitted as evidence, it would  
6 certainly be used for purposes like Mr. Turk had  
7 suggested that I read in here there's a radar system  
8 and argue that it has some bearing that's not  
9 supported by the experts in this case. This is  
10 something that would be in aid of an expert. This  
11 witness has not bought into adopting this as something  
12 that he relies on. The State objects as being not  
13 relevant.

14 MR. TURK: May I respond?

15 CHAIRMAN FARRAR: Wait. Were you  
16 finished, Mr. Soper?

17 MR. SOPER: That's my objection.

18 MR. TURK: I was careful, Your Honor, to  
19 ask the witness if he agrees with the descriptions, if  
20 he agrees that the pictures show what the pilot would  
21 see. I haven't heard the witness disagree with  
22 anything except possibly one area of the usage of  
23 radar. If he disagrees, that's what his record is.  
24 It's very clear. There's no misleading. There's no  
25 corruption of evidence here. I think it's useful and

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1 it should be in the record.

2 Certainly it's a much better depiction  
3 than what you have before you in some of the State's  
4 Exhibits from today including that aerial photograph  
5 which the contrast was poor, we don't know the  
6 elevation, we don't know what the pilot actually would  
7 see as he flies through Skull Valley. Here it's a  
8 camera view of an actual flight right at the flight  
9 location.

10 CHAIRMAN FARRAR: Mr. Gaukler?

11 MR. GAUKLER: I was going to suggest that  
12 I think that if nothing else you ought to admit the  
13 document at least with respect to the discussion of  
14 visibility to which Lt. Colonel Horstman did agree as  
15 far as I understood his testimony. The other stuff we  
16 do agree too, you may say it's not going to be  
17 admitted.

18 MR. TURK: Your Honor, I'm sorry to do  
19 this to you. Colonel Horstman talked about the HUD.  
20 He did a simulation in which he pointed his camera at  
21 the HUD. It was difficult to see the ground to the  
22 side of the HUD. This book contains a photograph of  
23 what the HUD looks at and what the view is to the side  
24 of the HUD. I think it's very useful in order to  
25 compare it to the simulation he performed where you're

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1 getting a good depiction of the HUD display and what  
2 you see.

3 (Judges confer.)

4 CHAIRMAN FARRAR: Notwithstanding the  
5 State's objection, we will admit the document on the  
6 visibility questions for what it adds to what we  
7 already knew. We will not admit it for the purpose of  
8 the radar because this witness has not endorsed that.  
9 If you want to get that in, you'll have to get it in  
10 through somebody else.

11 (The document referred to having  
12 previously been marked for identification  
13 as Staff's Exhibit 65, was received into  
14 evidence.)

15 MR. TURK: Your Honor, it's 5:12 p.m.  
16 Should I continue or do you want me to stop?

17 CHAIRMAN FARRAR: No, no. Keep going.  
18 Colonel Horstman, tell us when you need a break.  
19 Otherwise we're going to keep going.

20 LT. COLONEL HORSTMAN: I need 60 seconds.

21 CHAIRMAN FARRAR: Okay. You've got it.  
22 It's 5:15 p.m. Let's take ten minutes. Off the  
23 record.

24 (Whereupon, the foregoing matter went off  
25 the record at 5:15 p.m. and went back on

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1 the record at 5:27 p.m.)

2 CHAIRMAN FARRAR: On the record. How much  
3 more time with the Staff need?

4 MR. TURK: About 15 to 20 minutes.

5 CHAIRMAN FARRAR: All right. Mr. Gaukler?

6 MR. GAUKLER: I'm ready to go.

7 CHAIRMAN FARRAR: Go ahead, Mr. Turk.

8 BY MR. TURK:

9 Q I'd like to ask you a few questions about  
10 the aerial photograph which I believe is State Exhibit  
11 222.

12 A Okay.

13 Q You've flown many times. Correct? It's  
14 obvious.

15 A I've flown many times, yes.

16 Q At different elevations when you're at  
17 different altitudes, isn't it correct that the view  
18 you have of the ground, the contrast with which you  
19 see things on the ground differs according to the  
20 altitude?

21 A Yes.

22 Q So with respect to this photograph that  
23 the State has proffered, isn't it correct that unless  
24 we know the altitude we don't know whether this is the  
25 contrast that would be seen by a pilot flying through

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1 the Sevier B MOA?

2 A No. I don't think that's true at all. As  
3 I stated before, before every air-to-ground mission  
4 you use similar aerial photographs of targets and  
5 range work, et cetera, and familiar with looking those  
6 and translating those into the pilots mind as to what  
7 he should anticipate visually at each of the selected  
8 points. Pilots do this for every air-to-ground  
9 mission.

10 Q My question was a little bit different  
11 though. You had indicated I believe that your guess  
12 was that the main photograph was taken at did you say  
13 10 to 12000 feet. What was the number you guessed?

14 A No. I didn't say what they were taken at.  
15 I said they look like they appear to be at an altitude  
16 of about 10 to 12000 feet. It doesn't matter what  
17 altitude they're taken at.

18 Q A pilot flying at 5000 feet above the  
19 ground level would be able to see more contrast than  
20 would be shown in a photograph such as this State  
21 Exhibit 222. Correct?

22 A Perhaps, but not necessarily.

23 MR. SOPER: Which insert are you referring  
24 to? I need you to clarify your question if you would.

25 MR. TURK: The large photograph.

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1 BY MR. TURK:

2 Q Is that the one that you gave it a guess  
3 that it would be 10 to 12000 feet?

4 A Yes.

5 Q Was that the number?

6 A That's correct. I believe it is.

7 Q So your guess essentially is that if a  
8 pilot was 10 to 12000 feet above ground level that's  
9 the view he would have.

10 A If he looked out his window and down,  
11 that's about his field of view and about the level of  
12 resolution you would expect to see.

13 Q When we talk about contrast, we're not  
14 talking about the ability to see at a greater  
15 distance. We're talking about acuity. We're talking  
16 about sharpness and contrast between objects and their  
17 surrounding background. That's what's commonly  
18 referred to as contrast. Correct?

19 A I don't know that definition. It may be.

20 Q But you would agree that at closer  
21 distances to the ground the pilot would have greater  
22 contrast than at greater distances from the ground.

23 A Not always.

24 Q It would depend upon what?

25 A If you're looking for trees if you're

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1 lower, you might see them and if you're higher you  
2 might not. If it's a different kind of crop, you  
3 might see them from straight up better. So it depends  
4 on the object you're looking at.

5 Q Looking at the same object from two  
6 different heights.

7 A Okay.

8 Q 10000 feet versus 5000 feet above ground  
9 level.

10 A Okay.

11 Q Assuming the weather conditions, the haze  
12 conditions are the same.

13 A Okay.

14 Q The contrast would be greater at the lower  
15 altitude. Correct?

16 A Which way are we looking, straight down?

17 Q Looking down or looking slightly forward.

18 A Okay. Pilots don't look down. They  
19 periodically look slightly forward. So really the  
20 question that I can answer is looking forward. There  
21 would be different contrast. If you had a road  
22 perpendicular to your flight path, you would see it  
23 differently at 5000 feet than you would at 10000 feet.

24 Q The photograph that's State Exhibit 222.  
25 Is that looking down?

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1 A It's looking down.

2 Q So that's not the pilot's view.

3 A No. I never stated it was.

4 Q Okay. Incidentally the aerial photographs  
5 that are State Exhibit 222, those are not U.S. Air  
6 Force photographs. Are they?

7 A They all come from the same database.

8 Q But it's not the U.S. Air Force that took  
9 those pictures. Right?

10 A I don't know who took those pictures.

11 Q You don't know. Can I just ask a  
12 background question with respect to State Exhibit 223,  
13 the example number or case number 40 where it  
14 indicates this is November 21, 1996 event? There's a  
15 statement that appears which states "received  
16 directional heading to unpopulated area." Where did  
17 that directional heading information come from? Was  
18 that provided by a wingman? If you don't recall, it's  
19 not worth the time.

20 A I don't recall.

21 Q You were speaking about the Cedar  
22 Mountains not being visible or I think in your words  
23 "They would probably not be visible where there are  
24 clouds in Skull Valley." Do you recall that part of  
25 your testimony?

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1 A Yes I do.

2 Q What's the elevation of the peaks of the  
3 Cedar Mountains near the PFS site? Do you recall?

4 A We looked at it before. In that area, I  
5 believe it's about 2000 feet higher. I can look it  
6 up.

7 Q 2000 feet above ground level?

8 A Above the PFS site.

9 Q If a F-16 pilot was pointing his plane at  
10 the mountains prior to ejection, he could eject before  
11 the plane reached the side of the mountain. Correct?

12 A That's possible.

13 Q He wouldn't have to wait until he's  
14 directly over the peaks of the mountains to eject.

15 A That's correct. He would not have to  
16 wait.

17 Q He probably wouldn't because he would want  
18 to get out before there was impact on the mountain.

19 A Assuming that he wanted to eject while he  
20 was pointing at the mountains, that's correct.

21 (Discussion off the microphones.)

22 Q At one part in your testimony you  
23 indicated that "we've been told the casks are okay.  
24 If you hit them, they won't breach."

25 A That's correct.

1 Q Who told you that?

2 A The Air Force ran an analysis on weapons.  
3 I've looked at an impact analysis for an F-16 and the  
4 F-16 engine core.

5 Q And you did your own analysis?

6 A The Air Force did an analysis on whether  
7 munitions would breach the casks.

8 Q Did that include the F-16 engine?

9 CHAIRMAN FARRAR: Let's hold on a minute  
10 here. We had a whole bunch of motions on April 8th  
11 that said we weren't going to get into this.

12 MR. TURK: Okay. I'll withdraw.

13 CHAIRMAN FARRAR: I know he said something  
14 before which we were prepared to not pay much  
15 attention to because it was just him saying it.  
16 Excuse me, sir, with all due respect.

17 (Laughter.)

18 CHAIRMAN FARRAR: And so while your  
19 questions were permissible from that point of view, it  
20 seems to me if we allow this line of questioning then  
21 we'll be here next July 2nd talking about  
22 consequences.

23 MR. TURK: I agree, Your Honor. I  
24 certainly won't address consequences in our findings.  
25 I was surprised to hear the testimony. I wanted to be

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1 clear that it wasn't the Staff or PFS that made these  
2 representations that led to that piece of testimony.

3 CHAIRMAN FARRAR: Right. So unless I hear  
4 something different from the parties we're prepared to  
5 disregard the last few questions and in fact the  
6 statement made earlier in line with our April 8th  
7 rulings.

8 BY MR. TURK:

9 Q Doctor, there have been a lot of doctors  
10 in this case.

11 A I'm not one of them.

12 Q Colonel Horstman, are you aware of how  
13 tall the canister transfer building is proposed to be?

14 A I've seen the number written down. No.  
15 Not specifically. I've seen it but I don't recall  
16 specifically.

17 Q If it was a structure that was to rise  
18 some 90 or 100 feet above the Skull Valley that would  
19 be a fairly unique structure in that valley. Wouldn't  
20 it?

21 A Fairly unique, yes.

22 Q Are you aware of any other facility or  
23 structure in Skull Valley that would rise to that kind  
24 of a height?

25 A I could do some research but off the top

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1 of my head I don't believe there is.

2 Q Nothing that you recall from your flights  
3 through Skull Valley.

4 A No.

5 Q And also if the pad emplacement area was  
6 to be on the order of 500 pads measuring 30 by 67 feet  
7 each with 35 feet spacing in between rows of pads in  
8 one direction and five feet spacing between rows of  
9 pads in another direction, that would be a fairly  
10 large footprint. Would it not?

11 A It's a large footprint.

12 Q Certainly larger than anything else in  
13 Skull Valley.

14 A No.

15 Q There's some other industrial or  
16 structural footprint that's larger than that.

17 A That's not what you asked. The question  
18 that you asked was if it's the largest footprint. No,  
19 the farming area would be a larger footprint.

20 Q In terms of built up area, construction  
21 versus land, that would be the largest area.

22 A One of the largest, yes.

23 Q Probably the largest. No?

24 A Probably. I haven't seen it yet so I  
25 don't really know.

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1 Q You mentioned that you've seen farms in  
2 Skull Valley. Where in Skull Valley have you seen  
3 farms?

4 A They're in the photograph.

5 Q Are they farms or ranches?

6 A I have no idea what the difference is  
7 quite honestly.

8 Q Is the ground cultivated or is it simply  
9 rangeland?

10 A It's cultivated.

11 Q It's cultivated in rows.

12 A I don't know what it is today. It's been  
13 cultivated with various crops.

14 Q There was a lot of questioning by PFS  
15 Counsel about whether it's easier to avoid a city or  
16 easier to avoid something like the PFS facility. I  
17 think maybe there's one clarification with respect to  
18 that testimony that we need to ask. If you were  
19 located at the same distance from a city, for  
20 instance, let's say you're one mile away from a city  
21 parameter or beginning of a built up area, and you're  
22 one mile away from the PFS facility. Which would be  
23 easier to avoid through a maneuver?

24 A Are you pointed directly at both of them?

25 Q If you'd like to make that assumption,

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1 yes.

2 A No. I don't want to make that assumption.

3 Q Let's include that assumption.

4 A Which would be easier to avoid?

5 Q Yes.

6 A How far am I back from the city? One  
7 mile?

8 Q Let's try one mile and then we'll extend  
9 it out.

10 A It doesn't matter at one mile because you  
11 could over fly it even if you lose your engine.

12 Q Depending on the altitude at which you're  
13 located at that time.

14 A No. Not at all. Even if you're at 200  
15 knots at 2000 feet, you would still over fly it.

16 Q At 2000 feet. Is that what you said?

17 A Yes.

18 Q What if you're below 2000 feet?

19 A If you were at 1000 feet and you were one  
20 mile from it and you just lost an engine and allowed  
21 the airplane to hit the ground, you'd be 0.6 of a mile  
22 behind it. So you'd over fly it.

23 Q Assuming that over flight was not an  
24 option --

25 A You can't assume that.

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1 Q Because you're flight was already so low  
2 that you would run the risk of impact if you tried to  
3 over fly it.

4 A The Air Force has rules. That's why we  
5 fly above 500 or in this case above 1000 feet.

6 Q That's why you conduct normal operations  
7 at 500 or 1000 feet.

8 A Correct.

9 Q But here you're in an emergency situation.  
10 The plane has descended. We've seen examples that  
11 you've brought to our attention where the plane has  
12 descended close to the ground before there was  
13 ejection.

14 A Correct.

15 Q You were already below the 500 foot  
16 elevation. You're at some stated distance. I don't  
17 care if it's one mile or two miles or three miles.  
18 Whatever the distance is and you have to engage in  
19 some maneuver to avoid hitting either a city that's in  
20 front of you or a PFS facility. Isn't it correct that  
21 it's easier to avoid the smaller object than the  
22 larger object?

23 A At one mile, you're going to hit both.

24 Q I'm sorry.

25 A At one mile, you'll hit them both. You

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1 won't have any choice. You won't have enough G  
2 available to move below 500 feet.

3 Q That depends on your elevation. Correct?

4 A You just told me I'm below 500 feet.  
5 Under those parameters, you're going to impact them  
6 both. You're no longer a voting member.

7 Q Your view is that at 500 feet you have  
8 absolutely no turning capability.

9 A Well, we're in this descent at 1200 feet  
10 per minute at 200 knots. I've made a series of  
11 humongous errors to get there. So my judgement is  
12 pretty impaired to begin with. You just told me how  
13 big this site is and I could probably not maneuver  
14 around it if I'm pointed right at the middle of it  
15 from 500 feet. Now, if I decide to die, then I might  
16 be able to avoid it, but I can't guarantee it.

17 Q That's your best judgement as a pilot.

18 A Yes.

19 Q That's not what other pilots have done in  
20 the examples that we've seen in the accident reports.

21 MR. SOPER: Is that a question?

22 MR. TURK: Yes.

23 MR. SOPER: It's a statement. Isn't it.

24 MR. TURK: Could you read back my  
25 statement please?

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1 CHAIRMAN FARRAR: Just re-ask the  
2 question.

3 BY MR. TURK:

4 Q The examples that we've seen in different  
5 accident reports show pilots at low elevations taking  
6 some sort of a turning maneuver or avoidance maneuver  
7 or steering maneuver. Correct?

8 A Yes.

9 Q That's correct. Isn't it?

10 A That is correct. And whether they're  
11 successful depends on the size of the object they're  
12 trying to avoid. The size of the object that you've  
13 already discussed in your previous question, you don't  
14 have the ability to avoid it.

15 Q Even if you're right about that which I'll  
16 leave for a second, that would depend upon whether  
17 you're aiming dead center at the facility or off  
18 towards one edge of it. There are other variables  
19 you're not considering. Is that right?

20 A I'm trying to answer the question that you  
21 phrased to me. Based on the information that you gave  
22 me, the pilot can't avoid that site.

23 Q Regardless of whether he's pointing at the  
24 center of the facility --

25 (Inaudible.)

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1           A       If you were pointing at the extreme right  
2 edge, would you have enough maneuvering capability to  
3 maneuver to the right? I don't know that. I do know  
4 that if you're pointed to the middle, you can't avoid  
5 it.

6           Q       That would be a function of such factors  
7 as altitude. Correct?

8           A       Correct.

9           Q       Air speed. Correct?

10          A       Correct.

11          Q       And distance.

12          A       Correct.

13                   MR. TURK: I have nothing further.

14                   LT. COLONEL HORSTMAN: Would you like the  
15 other variables?

16                   BY MR. TURK:

17          Q       Sure.

18          A       Descent rate, forward visibility. All of  
19 these things would factor in.

20          Q       Okay.

21          A       If your descent rate was 5000 feet per  
22 minute, it wouldn't matter what you tried to do.

23                   CHAIRMAN FARRAR: Mr. Turk, did I hear you  
24 say that you were finished?

25                   MR. TURK: I'm asking Dr. Campe if there's

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1 anything else. We have nothing else.

2 (Judges confer.)

3 CHAIRMAN FARRAR: All right. Rather than  
4 trying to make any more progress, we'll shortly be  
5 adjourning for the evening. We will begin tomorrow,  
6 Mr. Gaukler, with your cross on the 59 reports.

7 MR. GAUKLER: Yes.

8 CHAIRMAN FARRAR: Then we'll let the Staff  
9 have a go at it. Again, we're going to be really  
10 pushed tomorrow to finish in a timely fashion. Just  
11 ask the questions. We don't need a lot of rehashing  
12 what we already know. Ask him the question. Those of  
13 you who were here for seismic know that the closer we  
14 got to the end, the more we insisted on convergence.  
15 So let's keep it moving.

16 Then we will have in fact I'm not saying  
17 I'm limiting you to an hour because even though Mr.  
18 Soper did it in an hour, he had the advantage of that  
19 being his witness. But once an hour passes, we're  
20 going to be looking at whether we're making progress  
21 or not. If you're making progress, we'll give you as  
22 much time as you need. If you're not making progress,  
23 we're going to start bringing the hammer down. So we  
24 ask the Applicant and the Staff to both consider that.  
25 Next would be the Staff panel. Is that right, Ms.

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1 Marco?

2 MS. MARCO: That's correct.

3 CHAIRMAN FARRAR: And you said that's  
4 brief.

5 MS. MARCO: Under an hour.

6 CHAIRMAN FARRAR: Okay. Then, Mr.  
7 Gaukler, you would put your panel back on.

8 MR. GAUKLER: Yes.

9 CHAIRMAN FARRAR: Okay. In case people  
10 have to scramble tomorrow, and we don't get a chance  
11 to say the nice good byes we did on seismic, let's  
12 review the bidding on the calendar. We'll start the  
13 post-filing calendar on Monday the 8th. Your opening  
14 filings will be due August 30th. The reply filings  
15 will be due on Monday, October 7th. We would then  
16 under the Commission's policy have 60 days to get our  
17 decision out which would be around December 5th.

18 As I have asked you once before, Mr.  
19 Silberg, maybe you can be of help. How many pages are  
20 we talking about?

21 MR. SILBERG: I remember in the three to  
22 four hundred page range.

23 CHAIRMAN FARRAR: Okay.

24 MR. SILBERG: I don't remember.

25 CHAIRMAN FARRAR: That's good enough for

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1 the purpose I need the number for. Then we will  
2 definitely ask you to file those as two separate  
3 documents just for ease of handling the paperwork.  
4 File one on seismic and one on aircraft. Each time  
5 you file, file separately. If you have to have a  
6 background in there, just use the same one for both.  
7 If I recall correctly, you've already filed on rail  
8 line.

9 MR. SILBERG: And the reply file is due on  
10 Monday.

11 CHAIRMAN FARRAR: Okay. Oh, good. I was  
12 afraid I would have nothing to do on Monday.

13 (Laughter.)

14 CHAIRMAN FARRAR: I'll pick those right  
15 up. Then I just wanted to make sure everyone had that  
16 understanding clear in case we're in a rush tomorrow  
17 to depart. If there's no other business, it's 5:55  
18 p.m. Mr. Gaukler?

19 MR. GAUKLER: I would suggest starting at  
20 8:30 a.m. tomorrow.

21 CHAIRMAN FARRAR: All right. We will do  
22 that. Let's start at 8:30 a.m. unless that's  
23 impossible for any of the principles. Ms. Nakahara,  
24 your plane this when?

25 MS. NAKAHARA: 6:20 p.m.

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1 MR. GAUKLER: 6:20 p.m. I think it is.

2 CHAIRMAN FARRAR: Same plane. Delta.  
3 Okay. 6:20 p.m. What's your deal on your --

4 MS. NAKAHARA: I have a rental car.

5 CHAIRMAN FARRAR: That's out of Dulles.  
6 Right?

7 MS. NAKAHARA: Yes.

8 CHAIRMAN FARRAR: Do you have to go back  
9 to your hotel first?

10 MS. NAKAHARA: No.

11 CHAIRMAN FARRAR: Matt, we can help them  
12 with their boxes. I mean, get your boxes ready and  
13 we'll get your labels on them and we'll make sure they  
14 get to Federal Express or whomever you're sending them  
15 with so you don't have to worry about that. Then it  
16 seems to me given the traffic tomorrow we have to be  
17 finished at 2:30 p.m. or they won't get out there. We  
18 will plan on that. Mr. Gaukler?

19 MR. GAUKLER: There was the questions of  
20 the exhibits which the State has. We have some Q. We  
21 also have WW through ZZ and a couple of others. We  
22 can either address them now or by phone conference.

23 CHAIRMAN FARRAR: We'll do a conference  
24 call. If we can do that tomorrow, fine, any of the  
25 administrative details.

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1 MR. GAUKLER: I just wanted to bring it  
2 up.

3 CHAIRMAN FARRAR: I'm glad you did. There  
4 may be a number of things, transcripts that have to be  
5 redone. There will be a lot of detail stuff. We will  
6 keep that open.

7 MR. TURK: Your Honor, there's one  
8 document that's not in the record on seismic that  
9 perhaps we should include. That's the exemption  
10 request and the subsequent modification of it. Do you  
11 think that might be useful to have in the record so  
12 that if there's a question of what it is that we're  
13 being asked to --

14 CHAIRMAN FARRAR: Was that not embraced in  
15 the Commission's decision saying we could deal with  
16 that?

17 MR. GAUKLER: It's probably embraced in  
18 the SER.

19 MR. TURK: It's referred to in the SER.  
20 It's discussed in the SER. But it's not physically  
21 there.

22 CHAIRMAN FARRAR: How big a document is  
23 it?

24 MR. GAUKLER: About an eighth of an inch,  
25 quarter of an inch.

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1 CHAIRMAN FARRAR: Oh. So it's not six  
2 volumes.

3 MR. GAUKLER: No.

4 CHAIRMAN FARRAR: Yes. Ms. Nakahara, I  
5 was assuming that we didn't really have to look at it.  
6 I guess, yes, let's have it.

7 MS. NAKAHARA: What's the modification?

8 MR. TURK: The change to the 2000 year  
9 return period.

10 JUDGE LAM: You would do both. We'd do  
11 the original and then the modified one.

12 MS. NAKAHARA: The single page?

13 MR. TURK: The second one is just a single  
14 page.

15 CHAIRMAN FARRAR: We all know what we're  
16 talking about, but some reviewing court might say what  
17 is this exemption request and be surprised that it  
18 never made it into the record.

19 MR. GAUKLER: Your Honor, I have copies.  
20 I'll bring them tomorrow.

21 CHAIRMAN FARRAR: Good suggestion, Mr.  
22 Turk. Thank you. Ms. Nakahara, you can speak for the  
23 State on that.

24 MR. SOPER: Briefly, Your Honor. It's  
25 just been pointed out that maybe when my secretary was

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1 formatting this a couple of these dates lost a digit  
2 on Exhibit 223. I thought I would just be helpful for  
3 the people who are looking at this overnight. Entry  
4 number 15, the correct date is 15 May rather than 5  
5 May.

6 CHAIRMAN FARRAR: Okay.

7 MR. SOPER: Entry number 49 is 31 May  
8 rather than 3 May.

9 CHAIRMAN FARRAR: All right.

10 MR. GAUKLER: What was the first one, Mr.  
11 Soper?

12 MR. SOPER: Do we want to change those on  
13 the original? Would that be convenient?

14 CHAIRMAN FARRAR: Yes. When we get the  
15 three from the reporter. This was introduced today.  
16 Right?

17 MR. SOPER: Yes.

18 CHAIRMAN FARRAR: Why don't you just go  
19 grab them now and make the marking.

20 MR. SOPER: I'll do that, Your Honor.

21 CHAIRMAN FARRAR: All right. Then it's  
22 6:00 p.m. We're recessed.

23 (Whereupon, the above-entitled matter  
24 concluded at 6:00 p.m.)

25

**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.

*15/ Rebecca Davis*  
\_\_\_\_\_  
Rebecca Davis  
Official Reporter  
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