

1 EXAMINER NEWMARK: Okay.

2 DIRECT EXAMINATION

3 BY MR. REYNOLDS:

4 Q Could you state your name, please.

5 A Wes Slaymaker, S-L-A-Y-M-A-K-E-R.

6 Q And Mr. Slaymaker, you filed some direct testimony in  
7 this case?

8 A That's correct.

9 Q Is it true and correct to the best of your knowledge?

10 A It is.

11 MR. REYNOLDS: All right. That's it.

12 EXAMINER NEWMARK: Okay. You're excused.

13 (Witness excused.)

14 EXAMINER NEWMARK: All right. Who's next?

15 MR. REYNOLDS: Dr. SCHOMER.

16 PAUL SCHOMER, TOWN OF FOREST WITNESS, DULY SWORN

17 EXAMINER NEWMARK: Okay.

18 DIRECT EXAMINATION

19 BY MR. REYNOLDS:

20 Q Can you state your name, please.

21 A Paul Schomer.

22 Q All right. And have you filed testimony in this  
23 case?

24 A Yes.

25 Q All right. In the form of direct?

1 A Yes.

2 Q And rebuttal?

3 A Surrebuttal.

4 Q Yeah, whatever.

5 A Yes.

6 Q Did you bring that testimony with you?

7 A I did not.

8 Q All right. And since giving that testimony, have you  
9 received other information such as Roberts  
10 surrebuttal or listening to the testimony of  
11 Mr. Hessler? Do you have anything to add to that  
12 testimony that you've already given in written form?

13 A I would have comment on what Mr. Hessler said this  
14 morning.

15 Q All right.

16 A That would be all.

17 Q Go ahead.

18 A There's two points I would make very briefly and very  
19 simply. One has to do with the pseudo-noise, and  
20 he's talked about it. We've talked about it a lot.  
21 It's a very important issue in terms of being able to  
22 measure things around a wind farm, and Mr. Hessler's  
23 introduced it. He and his father did a study which  
24 was published in NCEJ, which he referred to this  
25 morning.

1           And when you're dealing with wind noise --  
2           I'm going to try to make this very simple -- there's  
3           two kinds of turbulence. Turbulence is the air  
4           moving around for one reason or another. One kind of  
5           turbulence is just like the -- if you put a stick in  
6           water, a stream, and you see the line go out behind  
7           the stick, and that's called wake turbulence because  
8           it's just like a wake from a boat.

9           And there's another kind of turbulence  
10          called intrinsic turbulence. This is the air moving  
11          around on its own, heating the air against the ground  
12          or being turned over by buildings nearby or stones or  
13          shrubbery or whatever makes the air mixed up and not  
14          steady. So there's these two kinds of turbulence  
15          that is pseudo-noise, and this is what we're trying  
16          to get rid of so that we can make measurements that  
17          are accurate.

18        Q     Okay. So what's your comment on Mr. Hessler's  
19              comment?

20        A     The comment is that Mr. Hessler and his father  
21              measured only the wake turbulence in the wind tunnel  
22              because it was very smooth flow. It didn't have  
23              intrinsic turbulence, and the intrinsic turbulence is  
24              the much more dominating factor. And so the numbers  
25              he quotes for -- for what turbulence causes are quite

1 low compared to what you measure in reality.

2 Q All right. And how is that relevant to what we're  
3 considering here?

4 A That's relevant in the difference between the level  
5 of the turbine noise and the level of the background,  
6 that the level of the turbine compared to the level  
7 of the background exceeds 10 dBA. It's not less than  
8 10 dBA.

9 Q And why is that important?

10 A That is -- 10 dBA is thought of when you start to  
11 have serious problems with a new noise source  
12 compared to what was existing. And so this  
13 exceedance is significant, and the numbers presented  
14 by Mr. Hessler are identical to what has been  
15 published for just the total pseudo-noise.

16 Q All right. Do you have any comments on the issue of  
17 low frequency sound emanated from large turbines  
18 defined as above 2.3 megawatts versus low turbines,  
19 smaller turbines, less than 2 megawatts?

20 A I would expect in just about any machine, as the  
21 machine gets bigger, the dimensions get bigger. It's  
22 how it couples energy out of it. As the sound  
23 radiated will get bigger, which means the wavelength  
24 is longer. The fundamental dimension to the sound  
25 gets bigger, which means it's lower frequency. This

1 would -- I would expect from any machine, and I'm not  
2 surprised to see the data for this machine go that  
3 way.

4 Q And would that explain the wide or rather consistent  
5 complaints of health effects from the residents at  
6 Shirley that have 2.5 megawatt machines as opposed to  
7 other wind farms?

8 MR. WILSON: I'm going to object to that  
9 question to the extent that it goes to health  
10 impact. I don't think he's qualified as a health  
11 expert.

12 EXAMINER NEWMARK: Okay. I'll sustain  
13 that.

14 BY MR. REYNOLDS:

15 Q You have given testimony on the -- do you have  
16 information about the relative impacts of low  
17 frequency sound on health?

18 A Yes.

19 MR. WILSON: Objection.

20 MR. REYNOLDS: This has been the part of  
21 it. He's testified to this. We've had Mr. Hankard  
22 who testified about annoyance versus health.

23 EXAMINER NEWMARK: The first question, did  
24 you say complaints or did you say health?

25 MS. BENSKY: That was just a foundational

1 question.

2 MR. REYNOLDS: Yes. Exactly.

3 EXAMINER NEWMARK: That's fine. Let him  
4 answer.

5 THE WITNESS: What question am I answering  
6 now?

7 EXAMINER NEWMARK: None. Let him think.

8 BY MR. REYNOLDS:

9 Q All right. There has been testimony about -- from  
10 the Shirley Wind residents who have machines that are  
11 2.5 megawatts, and then we've had testimony about --  
12 from complaints that -- that are more of the sleep  
13 category as opposed to the nausea, headache, earache  
14 category, okay? You've given testimony that the  
15 infrasound impacts to human health focus on those  
16 kinds of symptoms like headache, nausea, vertigo,  
17 feeling of ill at ease, right?

18 A Yes.

19 Q Would the size of the turbines at Shirley and its  
20 likely higher production of low frequency noise have  
21 a potential explanation for why the folks at Shirley  
22 are having such difficulty?

23 A I think it's a potential explanation, but I think I  
24 could come up with -- there's other explanations  
25 maybe. But that's certainly a potential explanation.

1 Q All right. Well, the whole -- the point of this  
2 hearing is to try to determine whether the project as  
3 designed for the Town of Forest is -- is appropriate.

4 A Yes.

5 Q And size of turbines is one factor?

6 A It is a factor.

7 Q What else?

8 A I think that -- that the -- to me, one of the  
9 important factors has been the nature of the  
10 community being somewhat unique. This is -- the  
11 basic things that have been talked about here are  
12 most important. The testimony you had yesterday,  
13 although I was not here, I've heard that kind of  
14 thing before, and I think that the issue before us is  
15 whether that's going to continue. The people are  
16 being taken out of their homes by the sound. This is  
17 not new. As I've pointed out in my testimony, this  
18 has been going on for 30 years, not with wind farms  
19 but with low frequency noise, and especially  
20 pulsating noise.

21 The notion that wind farms is somehow  
22 different is just not -- makes sense. And that we  
23 know and we've known for years that these same  
24 symptoms have occurred over time with different kinds  
25 of sources of low frequency sound, and the result is

1 always the same. There's a fraction of the  
2 population, we don't think it's a large fraction,  
3 that has these symptoms to the point where some are  
4 driven out of their homes.

5 EXAMINER NEWMARK: Okay. Sir, I think  
6 wasn't the question what -- what was your question,  
7 what things can be done to prevent this, to reduce  
8 this?

9 MR. REYNOLDS: Yes.

10 BY MR. REYNOLDS:

11 Q Okay. So there are -- in your view, you've made a  
12 recommendation that if this project is -- is -- is  
13 approved, that the -- that the noise limits be  
14 reduced?

15 A I have made a recommendation that the noise limits be  
16 reduced and that the -- I have made a recommendation  
17 that the prediction based upon the average is not  
18 consistent with what's been put together as the  
19 procedures in Wisconsin.

20 Q All right. Explain that.

21 EXAMINER NEWMARK: Well, is this in his  
22 testimony already? He said he explained this.

23 MR. REYNOLDS: All right. Yeah.

24 EXAMINER NEWMARK: Okay.

25 BY MR. REYNOLDS:



1 Q Well, let me ask you this. We've been talking about  
2 average noise limits and maximum noise limits.

3 A Correct.

4 Q What are the limits that we should be shooting for  
5 here?

6 A Well, what I think about always is are things  
7 logical, is this what was meant. And as I understand  
8 it in Wisconsin and in this proceeding, people have  
9 said there's a 45 dB nighttime limit, and it has to  
10 be designed for 100 percent of the houses, the homes  
11 of nonparticipating residents meet 45 dB. It  
12 wouldn't be acceptable for 50 percent of the homes to  
13 meet 45 dB.

14 And then I ask the question, if 100  
15 percent of the homes have to meet 45 dB, how can you  
16 have 100 percent of the homes meeting it half the  
17 time is somehow different than half the homes meeting  
18 it all the time. To me the two are the very same  
19 thing, just on a basis of logic that if you have a  
20 rule of 45 dB, it should be that way. You can't have  
21 it -- it's met half the time at all the houses but  
22 it -- the two are the same.

23 Q So is that the -- is your recommendation for a 39 dB  
24 limit designed then to make sure that the maximum  
25 doesn't exceed 45?

1 A No. I was saying that we should model using zero at  
2 a minimum, model using zero as the modeling rather  
3 than .5.

4 Q Okay.

5 A So that there is -- you get closer to this  
6 realization that you have a limit met all the time at  
7 all the houses and not -- well, all the time at some  
8 of the houses you wouldn't permit, but some of the  
9 time at all the houses is permitted. And the two are  
10 identical, so it's difficult to understand the  
11 distinction.

12 Q So when you first looked at this, the model that you  
13 looked at in the application was based upon a zero  
14 coefficient?

15 A The original material presented, I think it was  
16 called Appendix V as I recall, had zero for the  
17 modeling.

18 Q And you thought that was an appropriate number?

19 A I believe that is an appropriate number.

20 Q And why be conservative in modeling?

21 A Well, one of the reasons I came to this -- two  
22 reasons I come to this. One is the one I've just  
23 illuminated, that if you have a rule that all the  
24 houses meet it and then you say half the time, and  
25 then you say but you can't have -- it's met 100

1 percent of the time at half the houses, there's no  
2 logic there.

3 The other reason is that this is supposed  
4 to be done in terms of the ISO standard. People say  
5 we're applying ISO 9613, and ISO 9613 calls for --  
6 if you follow it, it says we're making a  
7 conservative prediction and that the only  
8 permissible way and to say you're using 9613 is to  
9 make the prediction, and then if you want to have a  
10 time average according to ISO 9613, there's a  
11 specific procedure in the standard for doing that,  
12 and that's not being followed.

13 So I do it on the basis of logic, of what  
14 the rule is, and I've come to that conclusion on the  
15 basis of following the standards, which have not  
16 been followed.

17 Q So is it -- is it fair to say that a conservative  
18 model will err, if at all, on the side of public  
19 safety?

20 A I wouldn't call it erring, but it will certainly be  
21 on the side of public safety.

22 MR. REYNOLDS: Okay. That's all I have.

23 EXAMINER NEWMARK: Okay. Other questions?

24 CROSS-EXAMINATION

25 BY MR. WILSON:

1 Q Mr. Schomer, have you visited the site?

2 A No.

3 Q So that means you haven't taken any data at the site?

4 A No.

5 Q You testified in response to some questions from  
6 Mr. Reynolds that the nature of this community was  
7 very unique. If you haven't been to the site, how  
8 can you understand whether this community is unique  
9 or not?

10 A I find the unique factor in the activities this  
11 community has engaged in in terms of trying to  
12 maintain the quiet, rural nature of the community,  
13 and I find that to be similar to situations I've seen  
14 in other parts of the country where that kind of  
15 community existed, and I've seen very unique  
16 reactions when that exists.

17 Q So if I understood your testimony, what's unique  
18 about this community is that they're -- at least some  
19 people in the community are fighting the project?

20 A No. I said that in the testimony I've read that's  
21 been put in place in this, that this community has a  
22 land use plan of some kind. I don't profess to be a  
23 planner and get all the terms right, but that this  
24 community has gone out and said we want to maintain  
25 the quiet, rural nature of this community, we don't

1 want to plan for industry, we want a plan for  
2 five-acre homes and the maintenance of farms. That's  
3 where they're unique.

4 And the similarity I find that was I --  
5 plans that the FAA tried to implement some probably  
6 25 or 30 years ago, and probably the one example I  
7 can think of where the FAA was eventually stopped by  
8 Congress because of the uproar. And I find this --  
9 the dynamics of this community to be along those  
10 lines.

11 Q So you've reviewed the comprehensive plan for the  
12 Town of Forest?

13 A I've reviewed the testimony.

14 Q But you haven't reviewed the plan?

15 A I've not reviewed the document, no.

16 Q Are you familiar with the fact that in Wisconsin,  
17 most local communities have to do some type of  
18 comprehensive plan by law?

19 A Yes.

20 Q Okay. So they're not unique from that perspective?

21 A No.

22 Q Okay. You don't have any medical training; is that  
23 right?

24 A That's correct.

25 Q You have an engineering degree?

1 A Correct.

2 Q So if you take a look at page 2 of your direct  
3 testimony. You have a copy of your testimony with  
4 you?

5 A I wasn't asked to bring them, so I am at the mercy of  
6 somebody to give me a copy.

7 MR. REYNOLDS: What do you want, direct?

8 MR. WILSON: For the time being, yes.

9 MR. REYNOLDS: All right.

10 MR. WILSON: He'll need sur, too.

11 MR. REYNOLDS: He is on direct.

12 THE WITNESS: All right. Page 2.

13 BY MR. WILSON:

14 Q Line 17 and 18, I find within a reasonable degree of  
15 engineering certainty that there will be significant  
16 health impacts. Can you explain to me the  
17 relationship between engineering and health impacts?

18 A I think that we've heard Mr. Hessler testify, and I  
19 think that on the same basis we have been observing  
20 and learning about these problems for many years.  
21 And, no, we're not going to give prescriptions out  
22 and -- but we understand better the acoustics and the  
23 physics, and I think that there's a shared burden to  
24 do these things properly, but we are part of the  
25 team.

1 Q Okay. Are you saying that -- you've already  
2 testified you're not a health expert; is that  
3 correct?

4 A I have testified, and I'm certainly not trained as a  
5 health expert.

6 Q Are you a health expert?

7 A I think I understand something about the health  
8 effects of noise from the literature that I follow.  
9 Does that say I'm a doctor, no.

10 MR. WILSON: Did you give him his sur?

11 MR. REYNOLDS: He's got it.

12 BY MR. WILSON:

13 Q So at page 11 of your sur, you're talking about your  
14 conclusion that the 0.00 contour is appropriate?

15 THE WITNESS: I have to ask for page 11 of  
16 the sur.

17 MR. REYNOLDS: I'm sorry?

18 THE WITNESS: The surrebuttal.

19 MR. REYNOLDS: It's right there.

20 THE WITNESS: It is?

21 MR. REYNOLDS: Yeah. It's all tabbed  
22 together.

23 THE WITNESS: Oh, right behind that?

24 MR. REYNOLDS: Yep.

25 THE WITNESS: Okay. That should be easy.

1 Page 11.

2 MR. WILSON: Yes.

3 BY MR. WILSON:

4 Q So at 11 there, you are testifying at line 15 about  
5 the appropriateness of the zero contour, correct?

6 A Correct.

7 Q And you would agree that that contour is the most  
8 conservative possible?

9 A It's the most conservative possible using 9613.

10 Q Okay. Now, if we could go back to your direct  
11 testimony on page 9. On page 9 in the middle of the  
12 page there you're describing your Exhibit 2, which  
13 is, you know, the results of you running a model, and  
14 in this case you used -- you used both zero and .5;  
15 is that correct --

16 A Yes.

17 Q -- to produce Exhibit 2?

18 A That is true.

19 Q Okay. And reviewing your testimony here on page 9,  
20 there's nowhere where you indicate in your direct  
21 testimony here that using the .5 is inappropriate?

22 A At that point in time, we had not received the  
23 operation of the source levels from proponent as  
24 perhaps you recall, and I was trying to make sense  
25 out of this with data that we had been able to



1 collect off the internet, which were apparently  
2 precursor data to the real data. And my whole  
3 original testimony is somewhat screwed up because we  
4 didn't have the source data that should have been a  
5 part of the application.

6 Q Are you done?

7 A I'm saying I did the best I could given the data we  
8 did and didn't have.

9 Q Fair enough.

10 A And I did analysis of .5, but the analysis I did of  
11 .5 was equal to the zero case because the source data  
12 that I found were that much higher.

13 Q Okay. But you used a ground factor of .5 in your  
14 initial creation of Exhibit 2, correct?

15 A That was one of the numbers I looked at.

16 Q Okay. And why did you not at that time use zero for  
17 the entire run to create Exhibit 2?

18 A As I just told you, I was trying to figure out what  
19 was going on because I could not understand even what  
20 was being recommended by proponent, whether it was  
21 zero or .5, what the data were that were to be used.  
22 When I made my .5 predictions, they came out zero.  
23 The zero predictions of the report, I didn't know if  
24 the report was labeled wrong, whether there was 141  
25 houses as Mr. Hessler criticized my report for. It

1 was just -- would have been much better if we had the  
2 source data.

3 Q Okay. You have a fundamental belief that these  
4 models should be run using the zero contour, correct?

5 A I think that that's something that I thought about.  
6 I've not articulated it.

7 Q But you articulated it in your testimony?

8 A In this. Not up until here. I have -- I've come to  
9 that conclusion for Wisconsin for two reasons. One  
10 is because the standard that you say is being used  
11 calls for it. And the second is, when I read the  
12 rule, or as I understand the rule, and I have read  
13 the rule, there just doesn't seem to be a difference  
14 between the application two different ways. I have  
15 made predictions using the annual average for sources  
16 that call for that specifically. When you make  
17 predictions for an airport, it calls for the annual  
18 average. When you make predictions for a highway,  
19 these are called for. I didn't see that they were  
20 called for here. I saw a different kind of thing.

21 Q Okay. So you testified that you just recently came  
22 to the conclusion that zero is appropriate only here  
23 in Wisconsin; is that correct?

24 A No. I think it's probably a good idea all over, but  
25 it's something that we haven't done in this country

1 in transportation noise sources.

2 Q Okay. But this was a recent revelation that you've  
3 had; is that correct?

4 A This actually occurred serendipitously. I was asked  
5 to give a lecture this coming November on ISO 9613.  
6 And when I started to put the lecture together, I  
7 realized that it was calling for this conservative  
8 prediction and that indeed I had been misusing the  
9 standard, and I was on the committee that wrote it  
10 when it was written.

11 Q So does this revelation occur between the time that  
12 you submitted your direct testimony and the time you  
13 submitted your surrebuttal testimony?

14 A That part of it does, yes.

15 Q Yeah. So that explains why you were willing to use a  
16 .5 in your direct testimony but not in your  
17 surrebuttal testimony?

18 A No. The .5, as I've tried to say, is lots of reasons  
19 for it being there. Part of it is I tried to  
20 understand what was going on.

21 MR. WILSON: I think that's all we have.

22 EXAMINER NEWMARK: May or may not be. I  
23 want to let you know before you stop, I've decided  
24 to allow that Schomer page 6 on surrebuttal in.  
25 Basically we have so many standards at this point in

1 the record, and the studies we let in refer to WHO  
2 and all kinds of European standards, day and night  
3 standards. Let's just put it all in, and I'll give  
4 you a chance to cross him on that if you need to.  
5 None?

6 MR. WILSON: We're just fine with your  
7 ruling.

8 EXAMINER NEWMARK: All right. Any other  
9 questions?

10 MS. BENSKY: I have a few.

11 CROSS-EXAMINATION

12 BY MS. BENSKY:

13 Q We've talked a lot about this ISO 9613 standard. You  
14 said you were on the committee that wrote it?

15 A Correct.

16 Q Mr. McKeever is passing them out to everyone so I  
17 think it will be helpful to --

18 A I can't hear so well at my -- you have to speak up a  
19 little bit.

20 Q You spent too much time around wind turbines? Sorry.  
21 That was a joke. It was funny.

22 So you've just been handed a piece of  
23 paper. Is this the international standard 9613-2  
24 that you helped create?

25 A Yes.

1 Q And this was designed in 1996, correct?

2 A This was first edition it says 1996, December 15th.

3 Q And has it been revised since then?

4 A No.

5 Q Was this standard designed specifically for wind  
6 turbine noise?

7 A No.

8 Q And if you turn to page -- I don't know what page it  
9 is -- the pages don't appear to be numbered. If you  
10 turn five pages in, it says acoustics.

11 A Okay. Maybe you have a clause number.

12 Q Part 2, acoustics attenuation of sound during  
13 propagation outdoors. It's the fifth page in.

14 A I'm not sure I know what -- there's Clause 2 is the  
15 following -- there's normative references. Are you  
16 in the --

17 EXAMINER NEWMARK: I think you have it  
18 right in front there.

19 THE WITNESS: Part 2, yes. That's all  
20 dealing with Part 2. Part 1 is air absorption,  
21 tables of air absorption.

22 EXAMINER NEWMARK: Can I have that back,  
23 please? I'm going to follow along.

24 THE WITNESS: Okay. Part 2.

25 BY MS. BENSKY:

1 Q And there are two columns on this page, and the  
2 right-hand column, the second paragraph beginning  
3 with the word, this method is applicable. Do you see  
4 where I am? That's on the right-hand column near the  
5 top.

6 A This method is applicable, yes.

7 Q Uh-huh. And it says, it is applicable directly or  
8 indirectly to most situations concerning road or rail  
9 traffic, industrial noise sources, construction  
10 activities, and many other ground-based noise  
11 sources. Is a wind turbine a ground-based noise  
12 source?

13 A Probably not. There's no other standard to use.

14 Q So this is the best standard, but it's not quite  
15 right?

16 A It's not going to be quite right.

17 Q But this standard specifically does not apply to  
18 sound from aircraft and flight or blast waves from  
19 mining, right?

20 A Okay. That was probably inserted by me.

21 Q Is one of the reasons why you are calling for using  
22 this very conservative absorption coefficient because  
23 of this limitation?

24 A That would be one of the reasons. We have -- we  
25 studied in my laboratory air to ground versus ground

1 to ground propagation by having one experiment where  
2 we had 100-foot-high tower that we did sound  
3 propagation measurements for, and then we had a  
4 source on the ground that we did the propagation  
5 measurements for, and the difference of 100-foot-high  
6 tower versus on the ground was -- oh, I've got  
7 published papers on it. I don't know that I remember  
8 the exact numbers. The levels -- the higher levels  
9 are about the same, but they're three times more  
10 often, then you're up 100 feet.

11 Q What happens if you're up 100 meters?

12 A It's going to possibly be even more frequent.  
13 Possibly be the same. I guess that didn't answer  
14 much, but that's the best I can do.

15 Q Well, the point is that we just don't know?

16 A Well, I know it won't be less, but I don't know  
17 that -- I haven't reached the saturation or that it's  
18 going to continue to grow.

19 Q Having this in your hand, and if you can do it very  
20 quickly, can you point to other paragraphs that  
21 encourage the model to be used in a conservative  
22 manner?

23 A Say that again, please.

24 Q Well, you talked about after looking through this,  
25 you realized that the intention was to obtain

1 conservative results; is that correct?

2 A Yes.

3 Q And I'm asking you where in the document we should  
4 look to get that information.

5 A Okay. That is one place. When it talks about the  
6 cement, and I just have to find where it talks about  
7 that. Well, in 3.2 in definitions it gives  
8 equivalent continuous downwind octave band sound  
9 pressure level, and downwind is a shorthand name for  
10 sound -- propagated sound where it travels in the  
11 louder manner. Because as everybody knows, you're  
12 downwind outdoors, it's louder than if you're upwind,  
13 and that's what the downwind means here, that you're  
14 getting a prediction that's hearing-enhanced  
15 propagation. So in 3.2, the definition of downwind  
16 indicates this. And then it talks about predicting  
17 the downwind. Let's see. I think on Equation 5 and  
18 6 -- in 5 it talks about the downwind again.

19 EXAMINER NEWMARK: That's meteorological  
20 conditions, number five? Is that where you're at?

21 THE WITNESS: No. I'm on Equation 5 on  
22 the unknown page, but it's in the end of Clause 6.

23 EXAMINER NEWMARK: Oh.

24 THE WITNESS: And this is the basic  
25 equation for using ISO 9613, and it talks about



1 downwind. And as I said, if one wants to calculate  
2 the long-term -- the long-term averages, if you look  
3 at the bottom of just before you get to 7,  
4 there's -- you go up two paragraphs, it says the  
5 long-term average weighted sound pressure LAT,  
6 paren, LT for long-term, shall be calculated  
7 according to the equation there, and that's not been  
8 done.

9 BY MS. BENSKY:

10 Q In this project?

11 A In this project.

12 Q And what's the significance of that?

13 A Well, this is the procedure that was designed in the  
14 standard for going from downwind to long-term if  
15 long-term wanted to be used. What this does is it  
16 says that if you're up in the air, which is what I  
17 just -- we know we are, they recognized when this was  
18 written, they being -- this was really based upon a  
19 German standard initially -- that when you have an  
20 elevated source, you're going to get this high level  
21 more of the time, as I said, three times as often,  
22 which was a whole lot of the time from 100-foot high.  
23 When you look at this case, this standard says that  
24 you never have anything but the high levels from an  
25 elevated source and that the -- the average that's

1 used for other sources shouldn't be used for this  
2 because it is elevated, and I think that's the  
3 difference that comes in here.

4 MS. BENSKY: Thank you.

5 EXAMINER NEWMARK: Anything else?

6 MS. BENSKY: Briefly.

7 BY MS. BENSKY:

8 Q Is it necessary for you to visit a site to be able to  
9 analyze data that was taken at that site?

10 A No.

11 Q Is this something that you do all the time in your  
12 professional work?

13 A Well, I like to judge the people that have made the  
14 measurements and have some feel for things, but I  
15 would say that things that are done by Mr. Hankard or  
16 Mr. Hessler, I believe the measurements in general.  
17 Now, I've said that I thought he was wrong on the  
18 empty pseudo-noise, but that's a separate thing.

19 Q And even though that you -- so, is your own  
20 experimentation necessary to be able to reach the  
21 opinions that you've reached in this case? Is it  
22 necessary for you personally to conduct experiments  
23 in order for you to reach the opinions that you have  
24 reached in this case?

25 A No. As I've said, even if I had done studies that

1 would be part of the team, that I think that nothing  
2 is done by one person alone.

3 Q And in fact, whoever uses this model is to some  
4 extent relying on your work, right?

5 A They're relying on my work. They're relying on the  
6 Deutsches In -- DIN, Deutsches Institut fur Normung.

7 Q So even though you've not been to the site, and even  
8 though you haven't done your own experimentation, can  
9 you still state the opinions that you stated in this  
10 case to a reasonable degree of scientific certainty?

11 A Yes, I do.

12 MS.

13 MS. BENSKY: Thank you.

14 EXAMINER NEWMARK: Okay. Other questions?

15 RECROSS-EXAMINATION

16 BY MR. WILSON:

17 Q Just a couple questions following up on ISO 9613-2.  
18 When you testified earlier that you were implementing  
19 a method incorrectly, was it this method that you  
20 were --

21 A I'm sorry? I don't quite follow the question.

22 Q Well, you told me -- you told me before when I was  
23 asking you questions that you had this recent  
24 epiphany which is the result now of using -- you're  
25 saying you use the zero ground contour, and you told

1 me that up until recently something had been -- had  
2 been implemented improperly by yourself as well.

3 A Yes. I had forgotten. I don't -- you know, I don't  
4 use 9613 that often. It's used for this, but it's  
5 not used -- I use 9613 for this, and I use it for  
6 small arms ranges occasionally.

7 Q Okay.

8 A But when you're doing airports or highways or other  
9 things, there's models put out by the DOT for those  
10 kinds of sources. So if you do general work, which I  
11 do in all kinds of noise areas, you use different  
12 things at different times. What I was saying is  
13 until I had looked over this to prepare this lecture  
14 for Brazil when I'll be there, I remembered that this  
15 was for the downwind situation, which is also called  
16 for in ISO 1996, which I do know because I'm chairman  
17 of that committee.

18 Q Okay. I just have one other question for you. Have  
19 you done any studies that implement this standard  
20 with your new recollection against actual sound  
21 measurements to be able to tell whether it's a good  
22 fit?

23 A Well, you're not looking for a good fit. When  
24 you're --

25 Q That's not my -- my question is this, have you

1 compared your calculations using this method against  
2 actual sound measurements with your recent  
3 recollection that you've got to do in a certain way?

4 A Well, of course I haven't.

5 MR. WILSON: Thank you. That's all.

6 EXAMINER NEWMARK: Okay. Redirect?

7 MR. REYNOLDS: Just a couple questions.

8 MR. LORENCE: Your Honor --

9 EXAMINER NEWMARK: Oh.

10 MR. LORENCE: -- I may have a question  
11 before we get to redirect.

12 MR. REYNOLDS: Sorry. Go ahead.

13 EXAMINER NEWMARK: While you're doing  
14 that, I was going to take a minute. Did we verify  
15 his testimony?

16 MR. REYNOLDS: If I didn't -- I thought I  
17 did.

18 EXAMINER NEWMARK: Did you? You know  
19 what, just do it again just in case because I don't  
20 remember.

21 FURTHER DIRECT EXAMINATION

22 BY MR. REYNOLDS:

23 Q Dr. Schomer, do you verify that the rebuttal or  
24 surrebuttal that you've given, or direct and  
25 surrebuttal, is true and correct?

1 A Yes.

2 MR. REYNOLDS: Okay.

3 EXAMINER NEWMARK: And these Exhibits 1  
4 through 4 as well?

5 MR. WILSON: Your Honor, I think given the  
6 discussion of this document, it probably ought to go  
7 in as an exhibit.

8 MR. McKEEVER: Yes.

9 MR. LORENCE: I'm going to ask a couple  
10 questions on it, so you may want to hold off on  
11 that.

12 EXAMINER NEWMARK: Okay. Let me just have  
13 him answer. Are Exhibits 1 through 4 -- sir?  
14 Mr. Schomer, Exhibits 1 through 4, were they  
15 filed -- are they correct to the best of your  
16 knowledge?

17 THE WITNESS: I'm sorry?

18 EXAMINER NEWMARK: Your Exhibits 1 through  
19 4, are they correct to the best of your knowledge?

20 THE WITNESS: Yes.

21 EXAMINER NEWMARK: Okay. Thanks.

22 All right. Commission staff.

23 CROSS-EXAMINATION

24 BY MR. LORENCE:

25 Q Dr. Schomer, on page 12 of your surrebuttal

1 testimony, and I'm looking on lines 6 through 8.

2 A Uh-huh. I guess I'm not fast enough. All right. I  
3 got to page 12.

4 Q On lines 6 through 8 you say, ISO 1996 requires what  
5 is termed "downwind" or weather-enhanced propagation  
6 conditions so that model predictions are only  
7 infrequently exceeded. Do you see that sentence?

8 A Yes.

9 Q I have never seen ISO 9613-2 before today. Could you  
10 tell me where that's required in this -- in this ISO  
11 9613?

12 A Those are the questions we just answered, but I can  
13 go through it again.

14 Q Well, you talked about the downwind stuff, but you  
15 say it says that it's only infrequently exceeded, and  
16 I'm wondering if it says that in here anywhere?

17 A That's what the downwind nomenclature means, and I  
18 believe it's in either 9613 -- I know it's in either  
19 9613 or in 1996, which 9613 incorporates by  
20 reference.

21 Q I have one more question, and again this shows my  
22 complete ignorance on this standard. In Section 7.3,  
23 that's called ground effects, and again there's not a  
24 page number here, but if you could turn to that.

25 A Okay. 7.3. 7.3, ground effects, yes.

1 Q Is this section equivalent of the ground factor that  
2 we've been talking about the last two days?

3 A This section is -- makes use of the ground factor.  
4 It's not equivalent. This is where the ground factor  
5 comes in. What you have is on the next page there's  
6 graphs showing the -- what the sound propagation is  
7 in different octave bands. And then in the  
8 implementation there's a table on the next page,  
9 Table 3, and in Table 3 if you look in there, there's  
10 A sub S or A sub R in the middle column at the top,  
11 and that's for the source or receiver region. We've  
12 been talking about there's really three factors, the  
13 .5 or the zero whatever. You have a factor for the  
14 source region, a factor for the middle, and a factor  
15 for the receiver region. And if you look at the  
16 formulas under A sub R of the middle column, you'll  
17 see a G. That's the ground factor that goes between  
18 zero and 1.

19 Q And that's the ground factor we have been talking  
20 about for two days?

21 A There's three of them technically: one for the  
22 source, one for the receiver, and one for the middle.

23 Q So if we turn back one page where it begins with the  
24 letter A, then it says hard ground.

25 A Hard ground, yes.



1 Q That first paragraph ends -- it says, for hard ground  
2 G equals zero. So this is the ground factor zero  
3 that we've been talking about, correct?

4 A Correct.

5 Q And then for porous ground in B, it's G equals 1?

6 A Correct.

7 Q And then for mixed ground, it says it's someplace in  
8 between zero and 1. Do you see that?

9 A I see that.

10 Q So this is the ground factor we've been talking about  
11 here?

12 A Yes. But to understand that is a question that was  
13 earlier. You've got a source up in the air and not  
14 on the ground, so does this standard really apply.  
15 And my answer was, it's the best we have, but you  
16 can't apply it exactly the way you would if it was on  
17 the ground because the source is as high in the air,  
18 it changes what the propagation is. So that the  
19 definition of what is hard and what is soft, you have  
20 a source that's 100 meters in the air on average.  
21 That's not on the ground as one of the other  
22 counsel's pointed out.

23 Q But it has to get to the ground -- the sound has to  
24 get to the ground eventually, doesn't it?

25 A It has to get to the ground eventually.

1 Q And once it's on the ground, won't it travel along  
2 the ground?

3 A No. It's only -- the only thing you have is an  
4 effect of the microphone height at your receiver.  
5 The other -- it doesn't -- it doesn't come down to  
6 the ground and then travel across the ground like  
7 this. It doesn't do that. What you're interested in  
8 is the path that goes straight from this up in the  
9 air source to your receiver, which may be near the  
10 ground, but you don't have any other path. If you  
11 do, it's because you don't have good propagation.  
12 Then it's poor propagation conditions.

13 MR. LORENCE: Thank you. I have no  
14 further questions.

15 MS. BENSKY: Your Honor, can I follow up  
16 on that? This is really important, and I want to  
17 make sure I understand.

18 RECROSS-EXAMINATION

19 BY MS. BENSKY:

20 Q So are you saying that if we have a flat -- if we  
21 have a flat ground, if there's a source that's close  
22 to the ground emanating sound, that sound can just go  
23 and be absorbed in the ground, correct?

24 A Ground absorption -- what happens, and this is more  
25 related to people's experience. You know, if we went

1 through all the details, it would be complicated, but  
2 I think people's experience is useful here. First of  
3 all, the first rule is that if you're downwind, it's  
4 louder than if you're upwind, and there's -- the  
5 reason is the downwind, and this is going to seem  
6 strange, we think of sound almost as rays, sound rays  
7 rather than waves.

8 And let's put it this way. Let's say you  
9 were behind the barrier. You expect it to be  
10 quieter. It's quieter because there's no direct path  
11 from the sound to you. It has to come around the  
12 corner just like if you had a -- something to stop  
13 the sun or a reflector of light. You go behind it,  
14 it's not as light as in front of it. Sound is the  
15 same thing. If you have a barrier or something that  
16 prevents the sound from getting to you, it's quieter  
17 than if you don't have that. Well, on a sunny day  
18 and you're upwind, you don't hear things. But if  
19 you're downwind, you do.

20 Another thing -- example, if you're out in  
21 a boat, do you hear things far away out in a boat?  
22 You've seen that? This is the hard surface of the  
23 water, and frequently above the water there's a  
24 temperature inversion because of the cooling and  
25 heating of the water. And those two can form two

1 layers that the sound gets trapped in, and then you  
2 have very -- you hear the people whispering on the  
3 shore, and it's like they're 10 feet away from you.  
4 I'm sure many of you have experienced this. This has  
5 to do with the propagation downwind versus upwind,  
6 has to do with the propagation.

7 The physics is complicated, but the  
8 effects -- same thing. Ever hear sources very early  
9 in the morning? You wake up at 5:00 a.m. and you  
10 hear a distant train or horns or the wheels? Have  
11 you experienced that? That again has -- at that time  
12 of day, you've got a direct path from the source,  
13 which is -- you don't hear the rest of the day to  
14 you. It has to do with the physics of the situation.

15 I'm not going to attempt to go into the  
16 physics, but I'm trying to give you different  
17 examples out of your daily life that show you this is  
18 what goes on. We don't want to really go into the  
19 details of what's going on.

20 Q So if there's a source up in the air that's emitting  
21 sound, the sound's going to come down and it's going  
22 to hit the receptor before it hits the ground and  
23 absorbs; is that correct?

24 A It's going to hit the receptor directly. There will  
25 be -- it gets confusing.

1 Q That's for sure.

2 A The ground is important only that it gives a  
3 reflection that can enhance or interfere with the  
4 direct path. But it does hit the microphone, that's  
5 the first thing it hits in time. The sound will  
6 arrive at the microphone before -- it comes directly  
7 from the source, so it will arrive first.

8 Q So somebody standing outside near a wind turbine or  
9 any source up in the air, that sound wave is going to  
10 travel down, and it's going to hit that person's ear  
11 before it goes down to the ground and gets absorbed?

12 A Well, won't be totally absorbed but, yes, it does hit  
13 you before it's absorbed. And I think your point is  
14 good, that as you're traveling along the ground, from  
15 ground to ground it will be absorbing some of the  
16 sounds, and that alone is -- that's part of the  
17 reason that the air-to-ground path is louder.

18 Q And so do you think it's proper to assume no  
19 absorption and use that 0.0 coefficient for this  
20 reason?

21 A That's part of the reason. Part of the reason is  
22 the -- in order to have a prediction that is what is  
23 called for in the standard, which is a prediction  
24 that is -- if you like the term conservative, a  
25 prediction that predicts what's going to happen 90

1 percent of the time or 95 percent of the time or some  
2 percentage of the time, I actually think that from  
3 the data that I know of, the prediction is probably  
4 the -- about 85 percent of the time would be  
5 included, and 15 percent of the time you would be  
6 above what's being predicted with the 0.00  
7 prediction. It's not the most conservative  
8 prediction in the world by any means.

9 Q But considering we have to use this model because we  
10 don't have anything better, the best way to use this  
11 model for a source that's 100 meters in the air is to  
12 use that 0.0 coefficient?

13 A 0.00 is the best you can do with this.

14 MS. BENSKY: Great. That's very helpful.  
15 Thank you.

16 MR. REYNOLDS: Couple questions on  
17 redirect.

18 REDIRECT EXAMINATION

19 BY MR. REYNOLDS:

20 Q Dr. Schomer, is it the heart of it that the challenge  
21 of creating a model to reflect what the citizens of  
22 Forest will actually experience, is that the heart of  
23 why it's better to have conservative estimates than  
24 not conservative estimates of sound? Because we're  
25 trying to figure out what's going to happen to the

1 citizens in Forest.

2 A I think there's probably lots of reasons I can think  
3 of for doing this. Again, we're dealing with a low  
4 frequency sound primarily. The A-weighted sound is  
5 going to correlate with it as it does with nearly all  
6 noise sources.

7 I think it's important to understand how  
8 the ear hears because that's all a part of this, and  
9 the ear doesn't hear all frequencies equally. It  
10 doesn't process all frequencies equally, and it gets  
11 very different at low frequencies. The ear gets very  
12 different at low frequencies, and this is one of the  
13 reasons I would say this is important. We -- I think  
14 Mr. Hessler testified that the threshold of hearing  
15 changes, or maybe it was in that paper that was  
16 passed out, but the threshold of hearing is very  
17 different from one person to another.

18 But what's even more important is that at  
19 the middle frequencies, like 1,000 hertz, a change of  
20 10 decibels is a doubling or a cutting in half of  
21 loudness. At these low frequencies, like let's say  
22 10 hertz, at 10 hertz, about a 2 dB change is a  
23 doubling of loudness. So at low frequencies,  
24 anything that you're off gets magnified by the ear.  
25 If you're off by 5 dB at low frequencies, that's a

1 factor of four in loudness. Whereas if you're off by  
2 5 dB at a middle frequency in a prediction, that's  
3 not even a factor of two in loudness. So errors get  
4 magnified at the low frequencies just because of how  
5 we hear.

6 Q That was one of the reasons for looking at the more  
7 conservative model. Are there any others?

8 A Well, let's see. I've talked about the standard  
9 calling for it. I've talked about it makes sense  
10 from the -- from the way the rule is written.  
11 Certainly it makes sense from being conservative from  
12 just the standpoint of how the ear hears. I think  
13 that just what we've talked about, the health effects  
14 and the fact that there's people that may be affected  
15 just like in one other community, somehow it seems  
16 like it calls for us to be cautious.

17 I think that if -- if it were some other  
18 area where government was involved directly, let's  
19 say, we're going to install -- we're going to license  
20 fire detectors that only work 90 percent of the time  
21 and 10 percent of the time people aren't warned about  
22 the fire protector, but that's good enough. People  
23 wouldn't say that's good enough, so the fire  
24 protection has to work all the time. And I think  
25 when we're talking about people literally being



1 driven out of their homes, we have to be a little bit  
2 cautious.

3 MR. REYNOLDS: Thank you. I don't have  
4 anything else.

5 EXAMINER NEWMARK: Highland?

6 MR. WILSON: No.

7 EXAMINER NEWMARK: All right. What are we  
8 doing with our ISO 9613-2?

9 MS. BENSKY: I'd like to move it into  
10 evidence.

11 EXAMINER NEWMARK: All right. Any  
12 objections?

13 MR. LORENCE: I guess I'd like to talk  
14 about that for a second.

15 EXAMINER NEWMARK: Okay.

16 MR. LORENCE: We've kept out all kinds of  
17 reports and exhibits today because they didn't come  
18 in at the proper time. Professor Schomer could have  
19 put it in at any time with his exhibits. I  
20 recognize that counsel here is not -- is not -- his  
21 witness is not asking this. But I guess I would ask  
22 the ALJ that under the theory that, you know, we've  
23 been keeping out late-filed things and this is  
24 awfully dense information, whether this should go in  
25 the record.

1 EXAMINER NEWMARK: Okay.

2 MR. LORENCE: And I just as a second aside  
3 for counsel, I'm not positive, but I think that  
4 these are usually under copyright, and is this  
5 something that we would be able to place on our  
6 website and make available to the world if -- I  
7 don't want to get you in any kind of copyright  
8 trouble if that's the case.

9 MR. McKEEVER: I'll just say I got it on  
10 the internet.

11 MR. LORENCE: Yeah.

12 MR. REYNOLDS: And this is the standard  
13 that has been used by all the measurers of sound, so  
14 this is -- this is kind of the bible of sound  
15 measurement.

16 MR. LORENCE: And I guess that reinforces  
17 my question then. Anybody could have put it in.  
18 Any of the experts could have put it in from direct  
19 testimony on it. So whether we get it here at this  
20 late hour or not, I'll defer to the decision, but  
21 I'm -- given what we've done today with other  
22 things, I just wanted to raise that point.

23 MS. BENSKY: I guess the nature of this  
24 exhibit is totally different. This exhibit doesn't  
25 give any opinions. It's just a standard that

1 everybody -- all the sound people in this case have  
2 used and relied upon. So I think it would be  
3 helpful to have it in. And even if it wasn't in, I  
4 think it's the type of material that could be quoted  
5 and briefed anyway, so --

6 EXAMINER NEWMARK: Let's not get into  
7 that.

8 MR. WILSON: I think at the risk of making  
9 it look like Ms. Bensky and I are on the same  
10 team --

11 EXAMINER NEWMARK: We would like to see  
12 that.

13 MR. WILSON: I agree.

14 EXAMINER NEWMARK: Okay.

15 MR. WILSON: It should come in.

16 EXAMINER NEWMARK: I understand.

17 MR. WILSON: There's a lot of testimony on  
18 it.

19 EXAMINER NEWMARK: Let me say the  
20 overarching concern I have or rationale for letting  
21 it in is we've cited to equations and all kinds of  
22 portions of this document which I think can only be  
23 correctly or adequately explained or referenced by  
24 having the document. So for the abundance of  
25 caution for making the record even larger, I think

1 it would enhance the Commissioner's review of the  
2 testimony we've just heard. So what's the number  
3 for this one? It's 9, Schomer 9, is that --

4 MR. REYNOLDS: I thought it was 5.

5 EXAMINER NEWMARK: Well, I don't know if  
6 we ever marked your other ones. I might have  
7 mentioned on the record because Mr. Schomer, I was  
8 not accepting his Exhibits 5 through 8, and I am  
9 pretty sure I referenced that at the beginning of  
10 the hearing. So we're just going to call this 9.

11 MS. BENSKY: Okay.

12 (Schomer Exhibit No. 9 marked and received.)

13 EXAMINER NEWMARK: All right. I think  
14 you're done.

15 THE WITNESS: Thanks.

16 EXAMINER NEWMARK: You're excused.

17 (Witness excused.)

18 EXAMINER NEWMARK: 3 o'clock. Let's take  
19 15 minutes.

20 (Break taken from 3:05 p.m. to 3:20 p.m.)

21 EXAMINER NEWMARK: Well, got enough people  
22 back, I guess. You want to start off the record?

23 MR. McKEEVER: Yeah.

24 (Discussion held off the record.)

25 EXAMINER NEWMARK: All right. Next?