

BEFORE THE OHIO POWER SITING BOARD

- - -

In the Matter of the :  
Application of Icebreaker :  
Windpower Inc. for a :  
Certificate to Construct : Case No. 16-1871-EL-BGN  
a Wind-Powered Electric :  
Generation Facility in :  
Cuyahoga County, Ohio. :

- - -

PROCEEDINGS

before Mr. Nick Walstra and Ms. Megan Addison,  
Administrative Law Judges, at the Public Utilities  
Commission of Ohio, 180 East Broad Street, Room 11-A,  
Columbus, Ohio, called at 9:00 a.m. on Thursday,  
September 27, 2018.

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VOLUME IV

- - -

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24 - - -  
25

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1 Thursday Morning Session,  
2 September 27, 2018.

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4 ALJ ADDISON: Let's go ahead and go on  
5 the record.

6 Mr. Secrest, you may call your next  
7 witness.

8 MR. SECREST: Thank you. May the  
9 Applicant call Todd Mabee.

10 ALJ ADDISON: Welcome, Mr. Mabee. Please  
11 raise your right hand.

12 (Witness sworn.)

13 ALJ ADDISON: Thank you, please be  
14 seated.

15 MR. SECREST: May I approach the witness,  
16 your Honor?

17 ALJ ADDISON: You may.

18 MR. SECREST: Thank you.

19 Your Honor, I've handed Mr. Mabee what's  
20 been marked as Applicant's Exhibit 32, a copy of his  
21 prefiled testimony. May I move to have that marked?

22 ALJ ADDISON: It will be so marked.

23 (EXHIBIT MARKED FOR IDENTIFICATION.)

24 ALJ ADDISON: Thank you.

25 MR. SECREST: Thank you.

1                                   - - -

2                                   TODD J. MABEE

3       being first duly sworn, as prescribed by law, was  
4       examined and testified as follows:

5                                   DIRECT EXAMINATION

6       By Mr. Secrest:

7               Q.     Mr. Mabee, would you please state your  
8       full name for the record?

9               A.     Todd Judson Mabee.

10              Q.     And, Mr. Mabee, if you would please refer  
11       to page 3 of your prefiled direct testimony,  
12       specifically lines 29 and 30.

13              A.     Yes.

14              Q.     Okay. Do you have a slight correction to  
15       your prefiled testimony?

16              A.     I do.

17              Q.     What is that?

18              A.     It just says "sampling," cross out the  
19       "i.e." and it says "during heavy precipitation and  
20       high seas."

21              Q.     Any other corrections to your prefiled  
22       testimony, Mr. Mabee?

23              A.     No.

24              Q.     Thank you.

25                   MR. SECREST: I tender Mr. Mabee for

1 cross. Thank you, your Honor.

2 ALJ ADDISON: Thank you very much.

3 Mr. Leppla, any questions?

4 MS. LEPPLA: No questions.

5 ALJ ADDISON: Thank you.

6 Mr. Stock?

7 MR. STOCK: Somehow I thought it would  
8 get to me.

9 What is the Exhibit No. on the testimony?

10 MR. SECREST: 32.

11 MR. STOCK: All right. Thanks. I see it  
12 in the upper right-hand corner. Thank you.

13 - - -

14 CROSS-EXAMINATION

15 By Mr. Stock:

16 Q. Good morning, Mr. Mabee.

17 A. Good morning.

18 Q. You've been here for the entire  
19 proceeding. You know who I am.

20 A. I do.

21 Q. Nice to meet you.

22 A. Likewise.

23 Q. If you take a look at your testimony on  
24 page 3, paragraph 7, it reads: "Please describe the  
25 history of your involvement with the project." And

1     you state "I started work on Icebreaker in February  
2     2018." Does that mean you had -- you personally had  
3     not done any work on this project prior to February  
4     of this year?

5             A.     That's correct, because I started  
6     employment with WEST in February of 2018.

7             Q.     Okay. Thank you. By whom were you  
8     employed before WEST?

9             A.     DNV GL.

10            Q.     What is the business of DNV GL?

11            A.     Well, it's like an accreditation company,  
12     but I was hired in the Biological Services  
13     Department.

14            Q.     What do you mean by an "accreditation  
15     company"?

16            A.     They verify, like, ISO standards for  
17     ships and offshore oil rigs, and they've got, like,  
18     five different businesses, 15,000 people. I was a  
19     small part of a renewable energy group there.

20            Q.     And they do certifications or  
21     accreditations for wind turbines?

22            A.     They certify -- I don't know for wind  
23     turbines, but certainly for -- they started in  
24     maritime, so ships, oil and gas.

25            Q.     I'm -- go ahead.



1           A.    Oh, I am just trying to think how to  
2 explain this business.  Most of the business, I have  
3 nothing to do with.  I was in a renewable energy  
4 group that provided biological services to developers  
5 all over.

6           Q.    Yes.  Doesn't DNV GL provide consulting  
7 services to wind-turbine project developers?

8           A.    Yes, they do.

9           Q.    Okay.  And they provide expert testimony  
10 in proceedings relating to wind turbine developments,  
11 correct?

12          A.    Yeah, they do.

13          Q.    Okay.  Did you ever provide expert  
14 testimony on behalf of a developer with respect to a  
15 wind-turbine project while you were with DNV GL?

16          A.    No, I did not.

17          Q.    Okay.  Where did you work prior to work  
18 at DNV GL?

19          A.    I worked for a company called ABR,  
20 formerly Alaska Biological Research.

21          Q.    And how long did you work at ABR?

22          A.    I think it was 18 years.  Most of my  
23 career.

24          Q.    What was your position at ABR?

25          A.    I had many.  I rose through the ranks

1 from a research biologist to a senior scientist and  
2 research coordinator.

3 Q. Did you do any avian radar studies while  
4 you were with ABR?

5 A. Yes. In fact, over 65.

6 Q. Okay.

7 A. Starting in -- geez, I did my first radar  
8 project in 1989, and then since 1998 to probably  
9 2016, I was involved with radar projects all over the  
10 U.S., Alaska, Hawaii, Mexico, so a lot of places.

11 Q. Now, were these pre-construction radar  
12 studies?

13 A. The vast -- excuse me. The vast majority  
14 were pre-construction radar studies, yes.

15 Q. Okay. What sort of equipment did you use  
16 for this vast majority of pre-construction radar  
17 studies?

18 A. X-band radars with open or fan-beam  
19 antennas on mobile radar labs. So we took marine  
20 radars which, of course, are designed for boats, and  
21 mounted them to trucks and vans and rental cars and  
22 everything else, traveled all over the place.

23 Q. So they were mobile radar units?

24 A. Correct.

25 Q. And you would take them to the proposed

1 project site to conduct your radar studies?

2 A. Yes.

3 Q. Okay. Did you ever use NEXRAD radar  
4 units to conduct these studies?

5 A. No.

6 Q. Okay. Now, sticking with Question 7 of  
7 your testimony, or paragraph 7, after you state you  
8 started working on Icebreaker in February of 2018,  
9 you state "I did not participate directly in any  
10 studies conducted for the project but rather focused  
11 solely on the Radar Monitoring Protocol which is  
12 attached as Attachment TJM-2. Now, if you take a  
13 look at Tab NN in your materials.

14 A. Which materials?

15 Q. Oh, I'm sorry. I haven't passed out the  
16 binders yet. That will be difficult then.

17 ALJ ADDISON: Let's go --

18 MR. STOCK: Give me a chance to wake up  
19 here.

20 ALJ ADDISON: Let's go off the record for  
21 a minute.

22 (Discussion off the record.)

23 ALJ ADDISON: Let's go ahead and go back  
24 on the record.

25 Mr. Stock.

1 MR. STOCK: Thank you.

2 Q. (By Mr. Stock) If you would turn to  
3 Tab KK -- well, excuse me. That's not what I want  
4 you to do. I want you to turn to Tab NN. This is  
5 Attachment TJM-2 to your testimony.

6 A. Okay. Radar Monitoring Protocol.

7 Q. Right. This is your work product; is  
8 that correct?

9 A. Yes.

10 Q. Okay. Did anyone at WEST assist you with  
11 putting together this work product?

12 A. This was a collaborative effort between  
13 WEST and ODNR to review all this documentation and  
14 come up with an appropriate Radar Monitoring  
15 Protocol. Yeah, I'm sure that -- I'm sure Rhett  
16 looked at this. I don't know. Rhett for sure.

17 ALJ ADDISON: When you say --

18 THE WITNESS: I'm sorry, Mr. Good.

19 ALJ ADDISON: Thank you.

20 Q. And -- but were you the primary author of  
21 this document?

22 A. Yes.

23 Q. Okay. So it reads: "Protocol based on  
24 the following: U.S. Fish and Wildlife Service & ODNR  
25 comments on monitoring dated February 28, 2017,"

1       which is our Tab 00; is that correct? Exhibit 7?

2             A.     Yeah, that's look correct.

3             Q.     Okay. U.S. Fish and Wildlife Service  
4       letter to ODNR, dated March 12 of 2018, which has  
5       already been put in evidence, I believe that's our  
6       Exhibit 6; is that correct?

7             ALJ ADDISON: That's correct.

8             MR. STOCK: All right. Thank you.

9             Q.     Dr. Diehl's evaluation which, again, I'm  
10       sorry, I failed to note --

11            MR. SECREST: Applicant's 37.

12            A.     Excuse me. Can I make notes on mine to  
13       reference these or not?

14            ALJ ADDISON: Let's go off the record for  
15       a minute.

16            (Discussion off the record.)

17            ALJ ADDISON: Please proceed, Mr. Stock.

18            MR. STOCK: Yes. Just for your  
19       edification, Fish and Wildlife Service comments, that  
20       first item, February 28, 2017, that's Exhibit 7 of  
21       the Bratenahl Residents.

22            The March 12th letter is Exhibit 6.

23            Dr. Diehl's report is Applicant --

24            MR. SECREST: 37.

25            MR. STOCK: Exhibit 37.

1           Accipiter letter to Lorry Wagner, dated  
2     February 21, 2018, I don't believe that's in  
3     evidence, is it?

4           MR. SECREST: It is not.

5           MR. STOCK: "Icebreaker Wind proposed  
6     compliance with ODNR USFWS Protocol dated January 3,  
7     2017," not in evidence, is it?

8           MR. SECREST: No.

9           MR. STOCK: Okay. "ODNR Wildlife Study  
10    Guidelines," that was admitted, was it not?

11          MR. SECREST: It was not. The Fish and  
12    Wildlife Service Energy Guidelines were.

13          MR. STOCK: Okay. Thank you.

14          radar pre- and post-construction  
15    protocols, version 3, has that been admitted?

16          MR. SECREST: No.

17          MR. STOCK: No.

18          Q. (By Mr. Stock) "ODNR meeting with WEST  
19    and Icebreaker on April 17, 2018," that doesn't look  
20    like it refers to a document; is that correct?

21          A. Yeah, I believe that's just a call we had  
22    with ODNR.

23          Q. Okay. "WEST and Accipiter professional  
24    experience designing & conducting bird migration  
25    studies. I think this is self-explanatory. That's

1 not a document, correct?

2 A. Right.

3 MR. STOCK: And "Icebreaker Windpower  
4 Inc. Response and Application Second Supplement Avian  
5 and Bat MOU (2017)," has that been admitted?

6 MR. SECREST: The Supplemental Avian and  
7 Bat MOU was. I don't recall, offhand, the Exhibit  
8 No.

9 MR. STOCK: Okay. That's one of your  
10 exhibits?

11 MR. SECREST: Correct.

12 MR. STOCK: Okay. Thank you.

13 Q. (By Mr. Stock) So in looking at the  
14 materials that this protocol was based upon, I do not  
15 see a mention of the November 29, 2016, summary of  
16 risks that is at Tab KK which is Exhibit 9. Is it  
17 correct you did not review that document for purposes  
18 of putting together the Radar Monitoring Protocol?

19 A. Yes, that's correct, I did not review  
20 that.

21 Q. Okay. And then if you turn to Tab LL,  
22 Exhibit 8, it does not appear, from your Radar  
23 Monitoring Protocol, that you reviewed that document  
24 to prepare this monitoring protocol. You didn't  
25 review the January 23, 2017, NEXRAD study, at LL,

1     which is Exhibit 8, correct?

2             A.    No, I did not review this protocol  
3     because this protocol is for marine radar, not  
4     NEXRAD.

5             Q.    Okay.  Thanks.

6                    Now, I want to take a look at Footnote  
7     2 --

8                    ALJ ADDISON:  I am sorry, Mr. Stock,  
9     which document are you on?

10                   MR. STOCK:  I'm sorry.  I'm in Tab NN,  
11     your Radar Monitoring Protocol.

12                   ALJ ADDISON:  Thank you.

13             Q.    Footnote 2, Attachment TJM-2.  It reads:  
14     "We note that the February 28, 2017 comments from the  
15     U.S. Fish and Wildlife Service and ODNR have been  
16     superseded, to some extent, by the comments contained  
17     in the Service's March 12, 2018 letter to ODNR...."  
18     Do you see that?

19             A.    I do.

20             Q.    Was it -- were you the source of the idea  
21     to put that footnote in this report?

22             A.    Well, you read half of the footnote; and  
23     the last half, I can say with certainty that, yes, I  
24     recommended the last half but which you did not read.

25             Q.    Well, who recommended the first half?



1           A.    I'm not sure. I would have to look at  
2   that again. I mean, the main point here was just to  
3   say that, you know, as you are probably aware,  
4   there's lots of documentation, over a lot of years,  
5   on how to do this radar study, right? So I came  
6   onboard new to the project and reviewed everything --  
7   everything that I thought, we thought, had been  
8   written talking about how to do a radar study.

9           And the footnote just is to explain that  
10  some of these comments no longer really applied, you  
11  know, like there were -- after the Diehl Report and  
12  the vendor was selected, you know, it's like hey, you  
13  take an S-band radar and do this. Well, that no  
14  longer applies because we follow the vendor  
15  recommendations of an X-band with a parabolic dish.  
16  Some of this stuff just didn't apply. That's the  
17  intent of the footnote.

18          Q.    Who supplied the March 12, 2018, letter  
19  to you?

20          A.    Who supplied the letter to me?

21          Q.    Yes.

22          A.    I would assume LEEDCo.

23          Q.    Okay. And it was someone at LEEDCo who  
24  suggested the language at the first part of  
25  Footnote 2, "We note that the February 28, 2017

1 comments from the U.S. Fish and Wildlife Service and  
2 ODNR have been superseded, to some extent, by the  
3 comments contained in the Service's March 12, 2018  
4 letter to ODNR"?

5 A. Yeah, like I said, I mean, I don't  
6 remember exactly if they -- they proposed this or I  
7 proposed this or we proposed this after reviewing it.  
8 I think it's just acknowledging there's been a  
9 sequence of events over time and letters and they  
10 don't all say the same thing, right? So it's to,  
11 like, make sure that they've all been acknowledged  
12 and all been incorporated in the protocol.

13 Q. I understand what you are telling me  
14 about what it -- what this footnote means.

15 A. Okay.

16 Q. What I am trying to find out is the  
17 genesis of the assertion of that first section of the  
18 footnote.

19 A. Yeah. I can't tell you exactly whether  
20 it was myself or LEEDCo or through discussions with  
21 LEEDCo that we thought that would be an appropriate  
22 footnote.

23 Q. Okay. Thanks.

24 A. Sure.

25 Q. Were you aware that Fish and Wildlife

1 Service and ODNR had been requesting, since 2008,  
2 that LEEDCo perform an avian radar study from a unit  
3 situated at the project site?

4 A. I didn't know the exact date, 2008, but I  
5 was aware that that request had been made.

6 Q. Okay. Now, if you take a look at Tab OO  
7 which is Exhibit 7.

8 A. Yes, I am there.

9 Q. This is one of the documents you indicate  
10 you reviewed in connection with putting together your  
11 Radar Monitoring Protocol, correct?

12 A. Correct.

13 Q. Okay. If you look at page 2, Section 3a,  
14 it reads: "Boat based radar is not technologically  
15 there yet, nor cost advantageous, and it focuses on  
16 waterfowl, but we have other methods outlined to  
17 address waterfowl." What do you understand ODNR and  
18 Fish and Wildlife Service to have been referencing  
19 regarding boat-based radar?

20 A. Honestly, I don't know what they're  
21 referencing. I mean marine radars, right, by -- by  
22 definition are boat-based radars, so they are  
23 technologically there. They've been used for decades  
24 so. And people have used boat-based radar to study  
25 bird migration studies and bird studies in Europe for

1 the same purposes, so the radar is there.

2 Q. Now, when you say "the radar is there,"  
3 you're talking about X-band radar?

4 A. X, S, both are considered marine radar.

5 Q. Okay. And you're talking about marine  
6 radar, correct?

7 A. Yeah, like I just said, X- and S-band are  
8 both considered marine radar.

9 Q. Okay. And then it reads: "NEXRAD data is  
10 not useful for assessing bird/bat behavior within  
11 rotor swept zone, which is the data we need." You  
12 understood that was Fish and Wildlife Service's and  
13 ODNR's position, correct?

14 A. Yes.

15 Q. Okay. Now, under subparagraph b,  
16 "Pre-construction," Roman number ii, it reads:  
17 Preferred is radar data from project area - Fish and  
18 Wildlife Service and ODNR have been requesting this  
19 information since 2008." You have no basis to  
20 dispute that assertion, do you?

21 A. Nope.

22 Q. Okay. "We still advocate for a single  
23 radar, on its own platform, within project area for  
24 spring and fall season of pre-construction monitoring  
25 as the preferred option." Did you understand Fish

1 and Wildlife service and ODNR when they reference a  
2 "single radar, on its own platform," to mean a stable  
3 platform?

4 MR. SECREST: Objection, speculation.

5 ALJ ADDISON: He can answer if he knows.

6 A. I'm aware, through other documents, that  
7 they had brought up the whole stable platform versus  
8 VBR issues.

9 Q. And they were in favor of a stable  
10 platform, correct?

11 A. Yeah, that's my understanding.

12 Q. Okay. Thank you.

13 I want to turn your attention to Tab O --  
14 not OO, excuse me. Please give me a minute because  
15 I'm trying to shorten this up.

16 ALJ ADDISON: Absolutely.

17 Q. Let's go to your testimony, paragraph 10.

18 A. Let's see. All right. Page 10, did you  
19 say?

20 Q. Question 10, that would be page 3 of your  
21 testimony.

22 A. Okay. I'm there.

23 Q. It reads: "Have you reviewed the Staff  
24 Report of Investigation that was filed in this docket  
25 on July 3, 2018 ("Staff Report") and the Stipulation

1 filed on September 4, 2018?" Do you see that?

2 A. Yes, I do.

3 Q. And you replied, "Yes, I have reviewed  
4 the Staff Report and Stipulation that address radar."  
5 Correct?

6 A. Correct.

7 Q. "11. Does the Radar Monitoring Protocol  
8 comply with all the conditions in the Staff Report?"

9 And you responded, "It complies with most  
10 conditions in the Staff Report. Based on our  
11 extensive discussions with ODNR, the 80 percent  
12 standard in the radar monitoring protocol could be  
13 met as long as it is contained -- as it contained an  
14 allowance for weather that would preclude sampling"  
15 -- and you changed the testimony -- "(during heavy  
16 precipitation, high seas)." Do you see that?

17 A. Yes, I do.

18 Q. Okay. Let's go to the Staff Report.

19 A. Okay. Is that an exhibit or can I take  
20 the one that's up here?

21 Q. Yeah, as long as it's there. We just  
22 need the document that's Staff Exhibit 1. Thank you.  
23 I want to go to page 48, Condition 22.

24 A. I'm there.

25 Q. Thank you.

1           It reads: "The Applicant shall implement  
2   a radar monitoring program which includes the  
3   following." Now, let me step back a second. Do you  
4   understand the conditions set forth in the Staff  
5   Report are those conditions that Staff are asserting  
6   should be included as conditions in any certificate  
7   that may be granted by the Power Siting Board for  
8   this project?

9           A.   That's my understanding, yes.

10          Q.   Okay. So if you go to subparagraph (d),  
11   it reads: "radar must be able to determine flight  
12   altitude of migrants at altitudes near and entirely  
13   within the rotor-swept zone at the project site to  
14   quantify collision risk." I read that correctly, did  
15   I not?

16          A.   You did.

17          Q.   All right. So you understand that that  
18   is a condition that Staff is suggesting should be  
19   included in the -- in any certificate that may be  
20   issued by the Board, correct?

21          A.   I do. I would note that, you know,  
22   "radar must be able to determine flight altitude of  
23   migrants at altitudes near and entirely within the  
24   rotor-swept zone...to quantify collision risk." I  
25   would say, you know, what it's going to do is it's

1 going to quantify exposure.

2 I think my colleagues have made the same  
3 point that, you know, exposure is just the number of  
4 birds that are going to be coming through the  
5 rotor-swept zone. There's no question that the radar  
6 will -- can provide that information.

7 Now, will it quantify collision risk?  
8 That's -- that's really -- well, what we know is that  
9 it can. It hasn't, it hasn't done that,  
10 pre-construction radar has not quantified collision  
11 risk in a post-construction setting. So  
12 pre-construction radar is not useful or able to  
13 predict post-construction risk. So I was just  
14 pointing out that word in this stipulation.

15 Q. So you say pre-construction radar to  
16 determine the flight altitude of migrants, at or near  
17 or entirely within the rotor-swept zone, is not  
18 useful to quantifying collision risk; is that what  
19 you're telling us?

20 A. I'm saying today the research has shown  
21 that that's correct, it does not -- pre-construction  
22 radar does not predict risk or fatalities in a  
23 post-construction setting.

24 Q. Is it useful information to have to  
25 attempt to quantify collision risk?



1           A.    Well, it's exposure data, right?  I  
2    think, as my colleagues mentioned yesterday, if you  
3    don't have any birds/bats passing through the area,  
4    you've got no exposure, that's useful information.  
5    If you have some passing through the area, that's  
6    useful information.  So it's -- it's information that  
7    can be used but it just hasn't been able to be used  
8    to predict risk is the point I am making.

9           Q.    Well, and -- and in the Staff's Condition  
10   d, what it says the information will be used to do is  
11   to quantify collision risk, correct?  Isn't that what  
12   that says?

13          A.    That's what it says.  I am just saying I  
14   don't think it will do that.

15          Q.    Okay.  Now, let's go to the Stipulation  
16   proposed by Icebreaker.  Do you have the Stipulation  
17   up there?

18               MR. STOCK:  Is it up there for him?

19               ALJ ADDISON:  It's Tab VV in the  
20   notebook.

21               THE WITNESS:  VV as in Victor?

22               ALJ ADDISON:  Yes.

23               THE WITNESS:  Okay.  I've got the --  
24   yeah, the Joint Stipulation.

25               MR. STOCK:  Thank you.

1 ALJ ADDISON: My pleasure.

2 Q. (By Mr. Stock) I want you to go to  
3 page -- well, I want you to go to Condition 22(d)  
4 which I guess is on page 7.

5 A. I'm there.

6 Q. And this is the language proposed in the  
7 Stipulation by Icebreaker for the certificate. It  
8 reads as well, does it not, "radar must be able to  
9 determine flight altitude of migrants at altitudes  
10 near and entirely within the rotor-swept zone at the  
11 project site to quantify collision risk." That's  
12 what the Stipulation proposed by Icebreaker says that  
13 information will be used to do, correct?

14 A. You're correct. That's exactly what it  
15 says. I'm just a scientist, and I'm careful with the  
16 words I use, and "risk" means something different  
17 than "exposure," so I was just trying to clarify that  
18 definition for clarity.

19 Q. Okay. Let's go back to your testimony,  
20 paragraph 12, which is on page 4.

21 A. Okay. I'm sorry. Question 12?

22 Q. Question 12, yes, on page 4.

23 A. Okay.

24 Q. And we need to look at the Staff Report  
25 for that so make sure you have the Staff Report

1       there. It references page 24 of the Staff Report.

2             A.     Page 24 or .24?

3             Q.     It says "On page 24 of the Staff Report."  
4     I am going to look, but I assume that's accurate. So  
5     if you look at page 24 of the Staff Report, first  
6     full paragraph after the bullet points, it reads:  
7     "At this time, it is unclear if a moving platform  
8     would be able to meet these criteria referenced  
9     above. A stable platform appears to be the most  
10    viable option to collect this data." Do you see  
11    that?

12            A.     I do.

13            Q.     In the Staff Report?

14            A.     Yes.

15            Q.     And then in your testimony at point 12,  
16    paragraph 12, it reads: "On page 24 of the Staff  
17    Report the Staff states that '[a] stable platform  
18    appears to be the most viable option to collect  
19    [radar] data.' Do you agree with this statement?"

20                   And you answer: "No, because this  
21    statement implies that the motion of the radar on a  
22    vessel-based radar ('VBR') system is the most  
23    important factor limiting the collection of viable  
24    data for the project. The Staff Report Condition 22  
25    lists seven conditions, six of which can be

1 accomplished on either a stable platform or VBR. The  
2 third radar [Condition 22(c)] (80 percent viable  
3 data) is most influenced by the weather (heavy  
4 precipitation and high seas), rather than the  
5 platform on which the radar sits. Heavy  
6 precipitation affects radar equally on a stable  
7 platform or VBR." Do you see that?

8 A. I do.

9 Q. Now, what experience do you have in  
10 designing and implementing radar studies that --  
11 where the radar unit is placed upon a vessel that is  
12 moving?

13 A. Well, I have over 20 years designing  
14 radar studies all over the U.S., Mexico, so I have  
15 vast experience designing radar studies. And radar  
16 is radar, whether it you mount it to a vessel or  
17 mount it to a platform or mount it to a rental car.  
18 It's still radar. And I have worked in Hawaii, along  
19 the shoreline, and I am very familiar with sea  
20 clutter. So I'm familiar with all the issues that  
21 will be -- that will come up at Icebreaker.

22 Q. Thank you for your explanation of your  
23 experience, but I don't believe you answered my  
24 question. What experience do you have in designing  
25 and implementing a pre-construction avian radar study

1 in which the unit was based on a moving platform?

2 A. Well, I haven't designed something to  
3 specifically be on a moving platform. But like I  
4 said, that's -- that's not really the main experience  
5 that's needed to design a successful study.

6 Q. What testing have you done to determine  
7 whether or not a radar -- an X-band radar unit placed  
8 on a moving platform will give you data that is  
9 comparable to the same unit being placed upon a  
10 stable platform?

11 A. Well, I haven't done any specific testing  
12 but what I know is that I know how radar works. I  
13 know how different configurations affect their  
14 abilities to perform under different conditions. And  
15 I'm aware that the Diehl Report made a recommendation  
16 for a specific type of radar and that particular type  
17 of radar is the best radar to work under those kind  
18 of conditions. So it's not all about the testing of  
19 it. It's about the understanding of the physics  
20 behind that radar to understand what would be the  
21 best configuration for a certain location. So, that  
22 I understand.

23 Q. You understand it, but you have no prior  
24 experience with it, correct?

25 A. Yeah, you're making it -- you are making

1 the issue sound like there is one aspect here that I  
2 don't have experience with. But, you know, this is  
3 the uncertainty around conducting a successful radar  
4 study, okay? So you've got a huge -- let's just say  
5 this is the uncertainty. You know, here is the issue  
6 of stable platform versus VBR, right? This is a  
7 small amount of uncertainty. Most of that  
8 uncertainty can be dealt with by picking an  
9 appropriate radar. The Diehl Report went through and  
10 picked a radar that has properties that will allow it  
11 to address these issues that you are bringing up over  
12 here.

13 So that's my point, that most of that  
14 uncertainty can be captured through the appropriate  
15 radar, of course, knowing how to use it, allowances  
16 for weather and precipitation that are typical, and  
17 then you have the issue of the stable versus  
18 vessel-based radar.

19 Q. And that issue which you keep pointing,  
20 over there to the side, is the one I want to talk  
21 about right now.

22 A. It is. I am just trying -- again, I am a  
23 scientist, so I --

24 Q. Right.

25 A. By design, I like to put things in proper

1 context.

2 Q. That's fine. And I'm entitled to find  
3 out the bases for your conclusion.

4 A. Sure.

5 Q. And what I understand you to be telling  
6 me is the bases for your conclusion that -- well, you  
7 are telling us that the placement of an X-band radar  
8 unit on a moving platform, in and of itself, without  
9 any other variables, simply the movement of the  
10 platform, will have no affect upon the collection of  
11 usable data?

12 A. Those are your words, not mine.

13 Q. And this is what I am asking you.

14 A. It will have an effect. The degree to  
15 which is unknown. You have to back up and say, okay,  
16 here is the issue. Now, what are the opportunities  
17 to solve that problem? Well, there are gimbals and  
18 accelerometers and devices which measure that motion,  
19 quantify it, and that can be turned around to correct  
20 for that. So it's not like there is no mitigation  
21 for this issue. We are all focused on the issue,  
22 which is fine, it's a factor, it's in my spectrum  
23 over here, it's just not the main one, so I am trying  
24 to clarify that.

25 Q. All right. So you acknowledge that the

1 effects are unknown and the solutions that you are  
2 attempting to construct to deal with those potential  
3 effects are solutions that, in your vast experience  
4 in the past, you've never had to implement; is that  
5 correct?

6 A. It's correct that I have not used gimbals  
7 and accelerometers in my past. But these are known  
8 techniques. It's not like it's something that I'm  
9 personally coming up with as, you know, Todd Mabee's  
10 idea how to deal with this. These are established  
11 mitigation options for this type of condition.

12 Q. When you say they are established  
13 options, where have they been established?

14 A. Well, the Diehl Report references them.  
15 Dr. Robert Diehl is one of the premiere radar  
16 ornithologies in the country. And if you look at who  
17 also reviewed that report, Dr. Sid Gauthreaux,  
18 Dr. Ron Larkin, I mean we will -- we can refer to it  
19 as the "Diehl Report" because he is the primary  
20 author, but if you understand radar ornithology and  
21 its history, Sid Gauthreaux, Dr. Larkin, I mean, they  
22 are the founders of that. They are the founders of  
23 radar ornithology.

24 So to have a report that says that here  
25 are mitigation options that are -- can address that



1 problem, they don't need my experience. I mean,  
2 these people are world-renowned people. So I trust  
3 those -- if they say those are mitigation options for  
4 that scenario, I trust that.

5 Q. Fair enough. And we are going to go  
6 through the report. But I'm asking, you're the  
7 expert on the stand here, I am asking your personal  
8 knowledge and your experience, and are you aware of  
9 studies that exist that purport to measure the effect  
10 that placing an X-band radar unit on a moving  
11 platform may have upon the ability of that unit to  
12 collect usable data regarding the presence of birds?

13 A. I'm sorry, you lost me a little bit in  
14 there. If you may repeat that.

15 MR. STOCK: Can that be read back?

16 ALJ ADDISON: We can read that back.

17 Thank you, Karen.

18 (Record read.)

19 A. I am aware of citations, within the Diehl  
20 Report, that speak to the use of that technology to  
21 address the issue, but not -- I don't think that  
22 answers your question exactly. As best I can  
23 understand that.

24 Q. Right. Are you aware of any study that  
25 purports to analyze whether or not the placement of a

1 NEXRAD or an X-band radar unit on a moving platform  
2 has deleterious effects on the ability of that unit  
3 to collect useful data regarding the presence of  
4 birds?

5 A. Yeah, I am not aware of a study that  
6 ex -- addresses that explicitly.

7 Q. All right. Thank you.

8 So when you say in your testimony, on  
9 page 12, that heavy precipitation affects radar  
10 equally on a stable platform or VBR, on what is that  
11 based? On what is that assertion based?

12 A. That assertion is based on an  
13 understanding of how radar detects rain. I've used  
14 radar for over 20 years, so I am well aware of how it  
15 detects and shows rain, and it's going to be the same  
16 on whether the vessel is moving or not.

17 Q. And so, what you are testifying to is  
18 that if the radar unit is on a vessel that's rocking  
19 severely in a high sea and during precipitation, that  
20 the ability of that radar unit, that is rocking  
21 severely on a high sea, is not impacted to any  
22 greater effect by precipitation than would be a radar  
23 unit at the same time on a stable platform?

24 A. Yeah, that's exactly correct.

25 Q. Okay. And on what data do you base that?

1           A.    Like I said, I've used radar for 20  
2    years.  You know, a radar on a mobile van in the  
3    middle of 50-mile an hour winds, which I have  
4    personally experienced, is rocking and rolling all  
5    over the place.  And does it collect rain the same  
6    and does it look like the same?  Yes, it looks like  
7    the same.  So that's my experience.

8           Q.    Okay.  Let's go to your testimony at  
9    paragraph 19.

10          A.    Okay.

11          Q.    Page 6.  Are you there?

12          A.    I am.

13          Q.    Okay.  "What are the mechanics or  
14   logistics of collecting radar data from VBR?"  
15   Vessel-based radar, right?

16          A.    Yes.

17          Q.    And you state "The radar system intended  
18   for use and recommended by Dr. Diehl in his report  
19   ('Diehl Report') is a fully-automated system that  
20   would collect, store, and transmit the data to an  
21   off-site location."  That was your answer, correct?

22          A.    Yes, you read that correctly.

23          Q.    All right.  Now, let's go to Paragraph  
24   28.  The question is: "The specific radar technology  
25   recommended in the Diehl Report is the Accipiter

1 NMI-24D Avian radar system. Why should we have  
2 confidence that this system will produce valid  
3 results?"

4 Answer: "Dr. Diehl is a recognized radar  
5 expert for ornithological studies in the U.S. and  
6 beyond. Accipiter, the recommended vendor, has a  
7 solid scientific reputation. Accipiter publishes  
8 information on the capabilities of radar systems and  
9 is located close to Lake Erie in case maintenance is  
10 needed. In my experience, using radar to study  
11 nocturnal migration for over 20 years, Accipiter is  
12 an excellent choice for this study. The radar allows  
13 the tracking of migrants in 3D space and has a narrow  
14 beam that helps minimize issues such as sea clutter."  
15 Do you see that?

16 A. I do.

17 Q. Okay. And that is a truthful statement  
18 in which you believe, correct, those are truthful  
19 statements?

20 A. Yes, that's my testimony. It's truthful.

21 Q. Okay. Thank you.

22 Let's take a look at the Diehl Report.  
23 It's at QQ. Now, in your answer to Question 19, you  
24 stated that the radar system intended for use was  
25 recommended by Dr. Diehl in his report, correct?

1           A.    Yes.

2           Q.    Okay.  And in his report, let's go to  
3 page 1.  VendorA is Accipiter, is it not?

4           A.    I believe so.  Yeah, VendorA is proposed  
5 most likely to succeed, yep.

6           Q.    Okay.  Let's go to the second full  
7 paragraph.  "Initial examination of these criteria,"  
8 which he sets forth above -- let's get those in the  
9 record.  "Among the most important criteria are  
10 concern over the ability to gather data on  
11 altitude-specific migration traffic rate or  
12 density...."

13          A.    Wait a minute.  I'm sorry.

14          Q.    I'm sorry.  First paragraph above it.  
15 Page 1.

16          A.    Yes.

17          Q.    Okay.  It's about halfway down,  
18 two-thirds of the way down.  I'm sorry.  Thank you  
19 for letting me.

20          A.    No problem.  I just lost it there for a  
21 second.

22          Q.    So approximately two-thirds of the way  
23 down.  Do you see the sentence that begins "Among" on  
24 the right-hand side?

25          A.    Yes.

1           Q.   "-- the most important criteria are  
2 concern over the ability to gather data on  
3 altitude-specific migration traffic rate or density,"  
4 correct?

5           A.   Yes, correct.

6           Q.   That was one of the most important  
7 criteria -- criteria that he was assessing, right?

8           A.   Yeah. And I'm assuming you are going to  
9 finish the sentence?

10          Q.   Oh, yeah, yeah.

11          A.   I'm sorry. I'm jumping the gun.

12          Q.   I am not going to cut you off.

13               Two, "and behavioral response to turbine  
14 presence (pre- versus post-construction)," that was  
15 another most-important criterion, correct?

16          A.   Yeah, absolutely.

17          Q.   And then a third, "the ability to do so  
18 with high reliability while avoiding contamination by  
19 clutter, primarily from insects on the lake surface."

20               So those are the three most-important  
21 criteria, as he labeled them, for his review of these  
22 proposals, correct?

23          A.   Yeah, I mean, this is what's stated in  
24 the Executive Summary, yes.

25          Q.   Okay. In your testimony you're referring

1 to what Dr. Diehl recommends and you're obtaining --  
2 those conclusions are based upon this report,  
3 correct?

4 MR. SECREST: Objection, vague.

5 ALJ ADDISON: Do you understand the  
6 question as posed?

7 THE WITNESS: I wouldn't mind having you  
8 repeat it if you would.

9 ALJ ADDISON: Please repeat your  
10 question, Mr. Stock.

11 MR. STOCK: Sure, I will.

12 Q. (By Mr. Stock) In fact, you say in  
13 response to, again, Question 19, "What are the  
14 mechanics or logistics of collecting radar data from  
15 VBR?" You say, "The radar system intended for use  
16 and recommended by Dr. Diehl in his report." This is  
17 the report from which you are characterizing that he  
18 recommended this radar system, correct?

19 A. Yes, that's correct.

20 Q. All right. Thank you.

21 Now, down to the second paragraph.

22 "Initial examination of these criteria  
23 narrowed the field to two options referred to as  
24 VendorA...." And I think we agreed VendorA is  
25 Accipiter, correct?

1           A.    Yes.

2           Q.    "...and VendorC (Option 2).  For reasons  
3 expanded upon below, VendorA proposed the approach  
4 most likely to succeed among vendor responses...."  
5 That's what he says, correct?  Is that correct?

6           A.    Yes, you've read that correctly.

7           Q.    He doesn't say "it will succeed."  He  
8 says "most likely to succeed among vendor responses,"  
9 correct?

10          A.    Yes, correct.

11          Q.    Okay.  "...and other information provided  
12 that forms the basis of this evaluation.  This should  
13 not be taken to mean VendorA's approach is not  
14 without concern...."  So he's saying he has concerns  
15 over VendorA's approach, correct?

16               MR. SECREST:  The document speaks for  
17 itself.

18               ALJ ADDISON:  He can answer.

19               MR. STOCK:  He characterized what the  
20 report recommended or didn't.

21               ALJ ADDISON:  I overruled the objection.

22               MR. STOCK:  Thank you.

23          A.    Yes, that's what it says.  I mean,  
24 there's -- there's concern over -- any study has, you  
25 know, issues that need to be addressed.



1           Q.    And he says "particularly over the  
2   ability to track targets in an offshore setting...."  
3   So that was a particular concern of his, correct?

4           A.    Yes, that's what it says.

5           Q.    Okay. "...where sea clutter will likely  
6   pose a persistent problem...." Do you agree sea  
7   clutter will likely pose a persistent problem?

8           A.    I do.

9           Q.    Okay. "...that is magnified by a rolling  
10   and pitching barge." So his belief, as expressed  
11   here, is that sea clutter will pose a persistent  
12   problem and that problem will be magnified by a  
13   rolling and pitching barge. You don't dispute that,  
14   do you?

15          A.    I don't dispute that, but this is the  
16   Executive Summary which just hits the highlights  
17   here, but if you read the report, which I'm sure you  
18   have, you realize there are mitigation options, which  
19   I briefly touched on, to address this problem. So I  
20   just don't want to --

21          Q.    We're not going to stop here.

22          A.    Leave it here.

23          Q.    Believe me. You've been here for a few  
24   days, we are not going to stop here.

25          A.    Okay.

1           Q.    The next paragraph starts: "Owing to  
2   perceived shortcomings of vendor responses, the  
3   report concludes by seeking to identify an approach  
4   to address the challenge of monitoring vertebrate  
5   behavior in an offshore setting that would increase  
6   the likelihood of gathering useful data."

7                   That references to later in the report,  
8   and we'll get there, that Dr. Diehl himself had some  
9   proposals regarding changes or modifications that  
10   should be made, correct?

11          A.    Yeah.

12          Q.    Okay.  "For these reasons, I suggest  
13   numerous modifications to VendorA's approach,"  
14   correct?

15          A.    Yes, correct.

16          Q.    All right.  Excuse me.  I'm just checking  
17   my notes.

18          A.    That's fine.

19          Q.    Page 18.

20          A.    Okay.  I'm there.

21          Q.    Paragraph 1, 2, 3.  "VendorA's response  
22   to the RFI...."  Are you with me there?

23          A.    Yes.

24          Q.    Okay.  "...was the most thorough of all  
25   the vendors and generally addresses the relevant

1 issues (although I was surprised by the large number  
2 of minor grammatical errors). VendorA has  
3 experienced with radar-based monitoring in relation  
4 to wind energy but not in offshore settings." Is  
5 that true?

6 A. That's what it says.

7 Q. Do you have any basis to dispute that?

8 A. No.

9 Q. Okay. Let's go back to your testimony.

10 Paragraph 20, page 6.

11 A. Okay.

12 Q. "How is VBR impacted during periods of  
13 high seas?"

14 And you answer, "High seas produce sea  
15 clutter, something that affects both VBR and a stable  
16 platform radar system. Sea clutter makes it  
17 difficult to measure flight altitudes of migrants  
18 close to the surface of the water. Mitigation  
19 options exist to address sea clutter, including the  
20 use of a radar fence or radar absorbing material."  
21 Do you see that?

22 A. Yes, I do.

23 Q. Okay. Now, with respect to a VBR, high  
24 seas will produce some -- something in addition to  
25 sea clutter, correct?

1           A.    What do you mean?

2           Q.    Well, there will be effects upon a  
3 floating vessel in the Lake in a high sea that there  
4 would not be upon a fixed platform in a high sea,  
5 correct?

6           A.    Yeah, that floating vessel is going to  
7 move -- move a bit more.

8           Q.    It's going to pitch?

9           A.    Pitch, roll, yaw.

10          Q.    Okay. What's pitch?

11          A.    Move forward.

12          Q.    Up and down from end to end?

13          A.    Yeah.

14          Q.    All right. What's roll? Sideways?

15          A.    Side to side.

16          Q.    Okay. It's a shame we can't do this on  
17 video. And what's yaw? That's moving, like,  
18 spinning about an axis?

19          A.    Correct.

20          Q.    Okay. None of those effects -- high seas  
21 will not have those effects, at least not nearly to  
22 the extent that they do -- high seas will not have  
23 those effects on a stable platform nearly to the  
24 extent that they would have upon a vessel floating on  
25 the water, correct?

1           A.    That's correct.  And like I said, and  
2   like Dr. Diehl said, there are options to deal with  
3   the yaw.  You have a GPS device to track the  
4   direction.  There is accelerometers or gimbals to  
5   either isolate that movement or to measure the  
6   movement and correct for it, so -- so yes, it will  
7   move, that's not in question --

8           Q.    Okay.

9           A.    -- but there are mitigation options which  
10  they talk about in the report.

11          Q.    Okay.  And we'll talk some more here.

12                So if you go back to page 18 of the Diehl  
13  Report under "Advantages".  Are you at page 18?

14          A.    Yeah, sorry, I'm ready.

15          Q.    That's all right.

16                "VendorA" -- Accipiter -- "is correct in  
17  its general assessment of the advantages of a  
18  pencil-beam produced by a parabolic antenna."  
19  Explain to us what they're doing?

20          A.    Okay.  Explain what that means?  I would  
21  love to.  So a parabolic -- a paraboloid is just a,  
22  think of a dish, if you will, so a parabolic antenna  
23  is just a round antenna, it's dish out, and the  
24  advantages of it is that it has a very focused beam.  
25  They refer to it as a pencil beam here.

1           Q.    Right.

2           A.    So the one proposed by the vendor is a  
3    4-degree conical-shaped beam. So I like to think  
4    about it as a flashlight, like a very focused beam.  
5    And let's contrast that to an open array or a fan  
6    beam, which is what I've used most of my career so I  
7    am very aware of what they are. It's what Fish and  
8    Wildlife have used on their S-band radars. Okay?

9                    So you have to back up a notch and say,  
10   well, what were marine radars designed to do? Well,  
11   they're designed to be on boats and not run into  
12   other boats, right? So the marine radars typically  
13   come with an open array, the fan beam. It's like a  
14   25-degree beam. And if you are pitching around, like  
15   we are talking about here, you're moving and  
16   pitching, you want a wide beam so that the radar is  
17   always looking at the water. So you pitch up, you  
18   still want the beam to be looking down to catch that  
19   boat so I don't run into it, okay? So if I may?

20           Q.    Yeah, yeah. I am not going to cut you  
21   off.

22           A.    So the pencil beam, on the other hand, is  
23   a very focused, like, I wouldn't say a laser, but a  
24   very focused beam of light. The advantage of the  
25   pencil beam is that if you have sea clutter, right,

1     which is bad, we don't want to see that, you need to  
2     be able -- you need to be able to elevate the beam  
3     above the sea clutter so you don't see it anymore.

4             Q.     Right.

5             A.     If you have this huge beam, you basically  
6     can't do it. But the pencil beam, you just crank it  
7     up and, at some point, you are not going to have sea  
8     clutter.

9             Q.     Okay.

10            A.     Is that -- I don't know if I went too  
11     far.

12            Q.     No, no, very helpful, but let's walk  
13     through it.

14            A.     Okay.

15            Q.     What did you call the beam that's -- the  
16     wider beam that's not a parabolic focused beam?

17            A.     Open beam, fan beam.

18            Q.     Wide array?

19            A.     T-bar. Open array. Whatever you like.

20            Q.     Okay. And you mentioned 25 degrees.

21            A.     Correct.

22            Q.     Now, does that mean -- again, we are  
23     using hands, so this -- but it's a -- is that like a  
24     broader V-shape from the point that the beam is  
25     emitted?

1           A.    Yeah, that's a 25-degree angle --

2           Q.    Okay.

3           A.    -- so.

4           Q.    It covers -- the angle, at the base, is  
5   25 degrees. So as it's spread -- as it spreads out,  
6   it is covering much more area; is that right?

7           A.    Yes.

8           Q.    Okay. Generally.

9           A.    Yeah.

10          Q.    And the issue of sea clutter is -- the  
11   problems created by sea clutter are greatest as you  
12   get closer to the horizon, correct, when you are  
13   trying to measure what's in the air?

14          A.    No, if I may go back and just define "sea  
15   clutter" since --

16          Q.    Sure.

17          A.    I don't know if everybody knows what sea  
18   clutter is. There has been a lot of talk about wave  
19   clutter, sea clutter, but I have been waiting for a  
20   definition. So sea clutter is -- so I am the radar,  
21   I send out the energy. If the wind is blowing and it  
22   forms, like, if there is a wave or especially if  
23   there's a white cap, the radar hits that and returns  
24   back. So it produces the echo as the signal coming  
25   back. The target is what we see on our screen and we



1 normally refer to as a target. In this case, that  
2 target is sea clutter. So that's sea clutter. Are  
3 we in agreement there?

4 Q. Yeah. My point was this, if you have --

5 A. Sea clutter you see everywhere. Sorry.  
6 Somebody asked, do you see it farther away? It's  
7 like no. Sea clutter, you are going to see  
8 everywhere on your screen. It's not just on the  
9 horizon. The radar is going to pick it up everywhere  
10 it's sampling, if it's oriented down low.

11 Q. That's the point I was getting to. If  
12 you have a pencil beam that's pointed straight up  
13 north from the surface of the Lake, you are going to  
14 have substantially less sea clutter than if you have  
15 it pointed lower closer to the surface of the water,  
16 correct?

17 A. If you have a pencil beam array and you  
18 point it straight up, you have got no sea clutter.

19 Q. Great. You point it toward the horizon,  
20 you are getting much closer to potentially having an  
21 issue with sea clutter; is that right?

22 A. Yeah. It's a 4-degree beam, so you have  
23 to ratchet it up, I don't know, --

24 Q. Okay.

25 A. -- some degree to get it above the sea

1 clutter.

2 Q. All right.

3 A. Now, which you -- if I may? -- which you  
4 can do with a pencil beam because it's focused. If  
5 you have this fan beam, this open array, it's just --  
6 you take a fan beam, it's a 25-degree beam, 12  
7 degrees at the horizontal or below. Again, it's  
8 designed for a boat. It's designed to be, you know,  
9 you're rolling, but it's still able to see that  
10 there's something down there so you don't run into  
11 it. So it's not appropriate for this, for the  
12 objectives of this study.

13 Q. Sure. And one of the advantages of the  
14 T- or open array --

15 A. Yeah.

16 Q. -- is that with the 25-degree angle from  
17 the base, with my fingers pointed in a V, you cover a  
18 bigger area, correct?

19 A. Bigger than what?

20 Q. Bigger than you would with a 4-degree  
21 pencil beam, a larger volume of area. At each  
22 elevation or distance from the point of the beam.

23 A. That's not really the correct way to  
24 think about it.

25 Q. All right.

1           A.    If I may?

2           Q.    Sure.

3           A.    So for -- it all depends on what you do  
4 with the antennas.

5           Q.    Okay.

6           A.    Right? So if you're -- I realize this is  
7 a little confusing, but can I use your pen as a prop?

8           ALJ ADDISON: Absolutely.

9           A.    So this is the pencil beam array and,  
10 you're right, it's a 4-degree beam so it's got a  
11 smaller area if it's just fixed, okay? But it's not  
12 going to be fixed. It's going to be spinning around  
13 and it's going to sample the whole air space of  
14 interest. So it's not going to sample less air space  
15 than this 25-degree beam.

16          Q.    I --

17          A.    Did that make sense? I am just trying to  
18 explain how it's going to work.

19          Q.    It's missing the question I am asking.

20          A.    All right.

21          Q.    If I use a finger pointing up as the  
22 pencil beam, that's a 4-degree focused pencil beam.

23          A.    Sure.

24          Q.    All right? That's a much tighter --

25          A.    It's a smaller angle --

1 Q. -- dispersion of the radar beam, correct?

2 A. Yeah, 4 is less than 25.

3 Q. All right. So it's pointed straight up.

4 A 25-degree beam is pointed straight up as well. And  
5 neither of them are moving. Okay?

6 A. Okay.

7 Q. The 25-degree beam, as it spreads out, is  
8 covering more volume of space than the pencil beam,  
9 correct, not more?

10 A. Yes.

11 Q. Okay. That's the point -- so --

12 A. But that's not how you sample with a  
13 radar, so I'm not clear where you are going with  
14 this.

15 Q. Where I am going is to understand how  
16 they work and how they're different.

17 A. Well, I could explain that if I -- if I  
18 may.

19 Q. Well --

20 A. It's up to you.

21 Q. Let me move on to a question. I think  
22 we've entertained ourself enough.

23 A. Okay.

24 Q. Let's go back to page 18, "Advantages."

25 "VendorA is correct in its general

1 assessment of the advantages of a pencil-beam  
2 produced by a parabolic antenna over its open-array  
3 counterparts, especially in relation to their ability  
4 to provide a 3-dimensional position of flying animals  
5 (IV.a). This negates the need to deploy a two-radar  
6 system, simplifying the overall operation" -- excuse  
7 me -- "which in turn decreases the likelihood of  
8 technical difficulties during operation. However,  
9 the single radar design, while attractive from the  
10 standpoint of simplicity, also removes any  
11 redundancy. Failure of VendorA to track targets  
12 owing to barge motion results in complete loss of  
13 data, a less likely outcome for two-radar systems  
14 employing complementary sampling."

15 What's he talking about "failure of  
16 VendorA to track targets owing to barge movement  
17 results in complete loss of data"? How could that  
18 happen?

19 A. There's a lot going on in this paragraph.  
20 And if I may explain?

21 Q. Sure.

22 A. The first point is in regards to the 3D,  
23 I think it's really important to note that the  
24 VendorA, the Accipiter radar, because it has this  
25 small beam, it can resolve the location of that

1 target space much better than you can if you have a  
2 wide beam. So you are saying, hey, I know it's  
3 somewhere in this 4-degree beam versus, yeah, it's  
4 somewhere in this 25-degree beam. So basically with  
5 this 4-degree beam you can get 3D information. This  
6 is critical, right? The whole Radar Monitoring  
7 Protocol -- not the whole -- a very important part of  
8 the radar Monitoring Protocol is to look at behavior  
9 avoidance and attraction effects.

10 If my arm is the turbine and you've got  
11 targets coming at it, you need to know what's going  
12 on at this target. Is this target going to fly into  
13 the turbine? Is it going to go around it? Is it  
14 going to go up and over it? The pencil beam radar,  
15 in its current configuration, will provide that 3D  
16 data.

17 If you have the dual system, which it  
18 talks about later in the paragraph, you have two  
19 different radars. You've got one radar that rotates  
20 in the horizontal plane that gives you information on  
21 flight directions. You are saying, okay, everything  
22 that's in this sampling volume, here is its flight  
23 direction. Fine.

24 Then you take a radar and you point it  
25 straight up, like you're talking about, to get

1 vertical flight altitude and number of targets.

2 That's fine and that's -- but that's actually a whole  
3 different area.

4 My point is you can't take all that data  
5 from the two radars and put it together to say, yeah,  
6 but what about the birds that are going through the  
7 rotor-swept area? Are they avoiding this? You can't  
8 do that. You can't put the data from them together.

9 With the pencil-beam radar, because it  
10 has this tight beam, it allows you to resolve that  
11 target's location in space and provide you that  
12 information for that target. So you can say here  
13 comes the target, here is the turbine, here is how it  
14 reacts. So that -- that's the first part of the  
15 paragraph.

16 Q. Okay.

17 A. Does that help clarify how those systems  
18 work and the differences of the information that they  
19 provide and the relevance to this project?

20 Q. Oh, that's very good.

21 A. Okay.

22 Q. Let's continue to the second part of the  
23 paragraph.

24 A. All right. Do you want to reask the  
25 question since I've spent some time on this?

1           Q.    Yeah.  Let's now talk about "Failure of  
2 VendorA to track targets owing to barge motion  
3 results in complete loss of data, a less likely  
4 outcome for two-radar systems employing complementary  
5 sampling."  Is it possible, using this 4-degree radar  
6 with the parabolic, what do we call it, a dish?

7           A.    Yes.

8           Q.    The dish helps to focus the radar -- the  
9 radar device emits a signal from, what, the center of  
10 the dish?

11          A.    Yes.

12          Q.    And the dish surrounds the radar beam to  
13 help focus it and keep it narrowed to that 4-degree  
14 angle; is that correct?

15          A.    Yeah.

16          Q.    Okay.  So it says here, "Failure of  
17 VendorA to track targets owing to barge motion  
18 results in complete loss of data."  Is it possible  
19 that there would be sufficient movement of the vessel  
20 on the Lake to result in complete loss of data?

21          A.    Yeah.  This is -- I think what he is  
22 trying to say is that there's tradeoffs with  
23 everything, right?  So if you have got this 4-degree  
24 beam and you are pitching around in high seas, you  
25 could be -- let's say you pitch backwards, the beam



1 comes up a little bit, it detects a target.

2 Q. Uh-huh.

3 A. Okay, great, it's recording it. And then  
4 you pitch forward, the beam goes down, the target is  
5 gone.

6 Q. Okay.

7 A. You pitch back up, now I have got a  
8 target. Well, the question is how is that software  
9 going to handle that scenario? And I think that's  
10 what he's referring to is that because it's -- if you  
11 have a wide beam, right, you can pitch all over the  
12 place and you are not going to lose that track. So  
13 there's -- there are tradeoffs. And I think that's  
14 what he is trying to say is that under high  
15 conditions, with a small sampling beam, you may have  
16 a target, lose it, have a target, lose it, depending  
17 on how you are.

18 And that's something you would probably  
19 just -- you are going to know those weather  
20 conditions. You just have to go back -- you might  
21 have to go back and review that data manually to make  
22 sure you're getting your tracks right. I think  
23 that's what he is saying.

24 Q. Well, we've agreed that Dr. Diehl is a  
25 renowned expert in this area, correct?

1           A.    Yeah.

2           Q.    Okay.  And the term he used is "results  
3   in complete loss of data."  And you tell me that your  
4   testimony about his recommendations is based on this  
5   report.  What does he mean, in your understanding, by  
6   a "complete loss of data"?

7           A.    Let's read the sentence again.  Well, you  
8   read half the sentence.  So, it's a comparison.  He  
9   is saying "Failure of VendorA to track targets owing  
10  to barge motion results in complete loss of data" --  
11  it should say "a less likely outcome for two radar  
12  systems employing complementary sampling."

13                You know, I am not totally clear, but I  
14  think he is just trying to articulate what I was  
15  trying to say, that the pencil-beam array will have  
16  difficulty tracking targets down low, if it's  
17  pitching and rolling, versus the wider beam.  It  
18  won't have that problem of tracking it, but it will  
19  have the problem of too much sea clutter so it's --

20           Q.    Is he not saying, in fact, that there is  
21  a possibility of a complete loss of data?

22           A.    Well, he says that, but I don't think  
23  that's what it means.

24           Q.    Okay.  Thank you.

25           A.    Because you're not going to lose the

1 data. You are going to collect the data. It's just  
2 a question of interpreting it properly to make a  
3 statement. I mean, I am not going to lose the data  
4 so.

5 Q. But the term he uses is "complete loss of  
6 data."

7 A. Yeah, that's what he said, but you are  
8 not going to lose the data. You're going to record  
9 the information whether it's high seas or not and  
10 it's -- the trick is what will the algorithm do to --  
11 what will it say happened. It's an interpretation  
12 issue.

13 Q. That -- what you're saying is that it may  
14 not be data that's usable for interpretation to  
15 determine a flight altitude or direction of a  
16 particular bird?

17 A. It may or may not be at those really low  
18 elevations, but that's the beauty of the pencil beam  
19 is you can raise that and you're still going to  
20 sample throughout the whole air space. You are just  
21 not right -- you are not trying to sample at the  
22 water. So you would still be able to get usable  
23 data, with a pencil beam, under those conditions.

24 Q. Okay. Page 19 under "Disadvantages."  
25 And, again, in your response to Question 19, you

1 indicated that this Accipiter radar system, intended  
2 for use, was recommended by Dr. Diehl in his report.

3 Under "Disadvantages" he states "I wonder  
4 about the ability of a 4-degree beam to maintain  
5 target tracking in the presence of seas that cause  
6 the barge to roll or pitch by an appreciable portion  
7 of this beam width." So that was a concern he was  
8 noting, correct?

9 A. Yeah. That was actually what I was  
10 describing --

11 Q. Okay. Thank you.

12 A. -- so.

13 Q. Next bullet point. "VendorA and their  
14 equipment are untested operating in offshore  
15 environments, so there is a greater risk of otherwise  
16 avoidable problems occurring during operation." Is  
17 it true VendorA's equipment is untested operating in  
18 offshore environments?

19 A. I have no reason to dispute that but,  
20 like I said, these are marine radars, they are built  
21 for marine environments.

22 Q. So -- and he says "...so there is the  
23 greater risk of otherwise avoidable problems  
24 occurring during operation." Dr. Diehl, our, at  
25 least by LEEDCo, recognized expert, says there is the

1 greater risk of otherwise avoidable problems  
2 occurring during operation. What do you understand  
3 him to mean by that?

4 A. I don't know exactly what he is saying  
5 but I do know that the plan to use -- before this  
6 radar went, you know, before it was officially  
7 sampling, the radar would be tested probably to work  
8 out these various issues.

9 There's always -- there are always issues  
10 setting up equipment in the field. Right? I have  
11 used radar forever. It is wise to test it and get it  
12 working properly before you have to sample and that's  
13 part of the plan.

14 Q. Did one of the vendors, who submitted a  
15 proposal, actually do some testing of a unit on a  
16 moving platform?

17 A. I don't remember -- I don't remember  
18 that.

19 Q. Do you recall having discussions with  
20 anyone about that?

21 A. About a vendor that had tested a radar on  
22 a moving platform?

23 Q. Yes.

24 A. No, I never had any discussions on that.

25 Q. So you have not heard any information

1 about that?

2 A. Not that I'm aware of. I mean, I read  
3 through this briefly, a long time ago, but I pretty  
4 much focused on the outcome which is this particular  
5 radar.

6 Q. Okay. Have you spoken to any of the  
7 vendors?

8 A. I have.

9 Q. Okay.

10 A. VendorA.

11 Q. Accipiter?

12 A. Yes, Accipiter.

13 Q. Have you asked Accipiter whether or not  
14 they've tested any of their equipment on a moving  
15 platform?

16 A. I did not ask that question.

17 Q. Okay. So you don't know whether or not  
18 they've tested this or not?

19 A. I do not know whether they have tested  
20 this. I do know that if this project moves forward,  
21 testing would be done in advance of the actual  
22 sampling.

23 Q. Okay. And the expert, Dr. Diehl, then  
24 says in his third bullet, "The capacity for VendorA  
25 to elevate their antenna may reduce clutter but is

1 unlikely to eliminate it sufficient to reliably  
2 enable data collection on horizontal and altitudinal  
3 movements." That's the opinion he states there. Do  
4 you have any basis to dispute that?

5 A. Well, I think he's trying to say if  
6 you're trying to sample just right close to the water  
7 because, clearly, at some point, you will not have a  
8 problem with sea clutter, so it's -- I don't have any  
9 basis to dispute it, assuming that he's talking  
10 sampling right above the water.

11 Q. Does he have that qualification in there,  
12 "assuming sampling just above the water"?

13 A. No. That's my qualification.

14 Q. Okay. But it's not the one that expert  
15 Diehl put in there, correct?

16 A. No, but I feel like I know what he's  
17 trying to communicate with that particular bullet.

18 Q. Page 23, "Conclusions."

19 A. I'm sorry. I am there.

20 Q. All right. Under "Conclusions": "Far too  
21 many unknowns are present to anticipate the outcome  
22 of radar work in relation to this project." Do you  
23 see that?

24 A. I do.

25 Q. He is not opining in his report that any

1 methodology used by Accipiter will, in fact, provide  
2 scientifically-valid data, correct?

3 A. Well, that's not what he said. That's --  
4 those are your words, not his.

5 Q. No, I asked a different question.

6 A. Okay. Try me again.

7 Q. Would you repeat the question back.

8 (Record read.)

9 A. Yeah, he is not guaranteeing that any of  
10 the vendors can go out and do this without any doubt.

11 Q. He's not concluding, at any level of  
12 certainty or unqualified assertion, that Accipiter's  
13 methodology will produce valid, scientifically-valid  
14 radar data, correct?

15 A. I am not sure I agree with that.

16 Q. Okay.

17 A. I mean, you are saying "at any level of  
18 certainty." I would want to review the report again  
19 to get a comprehensive. I mean --

20 Q. Is it time for a break? You can review  
21 it and see if there is language in there in which he  
22 opines that Accipiter's methodology will produce  
23 scientifically-valid data.

24 A. I don't think it says that it will  
25 produce, but I think he goes through all the pros and



1 cons of the radar and potential mitigation and, as  
2 you stated earlier, ways to improve, through his  
3 suggestions which Accipiter has done, so actually,  
4 you know, the current plan would be to incorporate  
5 his comments, so.

6 Q. Okay. Fair enough, fair enough.

7 A. Yeah.

8 Q. Let's read the next sentence on page 23.  
9 The first paragraph of his conclusions. "Use of a  
10 barge magnifies an already existing problem, that  
11 seas will introduce clutter into radar data." How  
12 does the use of a barge magnify that problem?

13 A. Well, I think we went through that,  
14 right? The barge problem is, in my opinion, you know  
15 a small part of the uncertainty of being able to do  
16 the study, right? It magnifies the problems by  
17 moving. But those problems, as he stated and as I  
18 stated, can be -- there are technologies there to  
19 address those problems. But it's not the biggest  
20 source of error in trying to collect viable data.  
21 The biggest thing is to get the radar right. Get the  
22 right radar, with the right capabilities, with the  
23 right ability to control it, that's what allows you  
24 to collect viable data to the best degree possible.

25 Q. Okay. Thank you.

1           Now, let's move to page 24. Second full  
2 paragraph.

3           "VendorA's use of parabolic antennas has  
4 advantages unique among these vendor responses. Many  
5 desired capabilities are addressed, perhaps most  
6 important among them is the ability to elevate a  
7 highly discrete beam as a means of attempting to  
8 reduce the impact of sea clutter, if only because  
9 this proves challenging for open-array antennas  
10 rotating in a horizontal plane (but see below). Less  
11 clear is how tracking would perform across sweeps on  
12 a rolling and pitching barge. VendorA reports that  
13 tracking could tolerate 2 degrees of pitch or roll,  
14 but it is easy to envision greater barge movement."  
15 Do you see that?

16           A. I do.

17           Q. Have you done any testing, with a barge  
18 on Lake Erie, to determine whether or not the barge  
19 will pitch or roll greater than 2 degrees?

20           A. Not to my knowledge.

21           Q. Okay. Now, it says "VendorA reports that  
22 tracking could tolerate 2 degrees of pitch or roll."  
23 Do you understand it to mean that tracking could not  
24 tolerate greater than 2 degrees of pitch or roll?

25           A. Well, he's just clarifying the

1 theoretical limitations of that beam, right? So when  
2 people talk about a 4-degree beam or a 25-degree  
3 beam, those are theoretical specifications. Okay?  
4 The theoretical specifications are based on what's  
5 called the half power point, so it says hey, if you  
6 look at the -- think of a spotlight -- you have got  
7 the radar coming out, 100 percent of the energy is  
8 going right down the central axis. As you move  
9 perpendicular from that access, at some point you hit  
10 what's called the half power Point, like half the  
11 density of that beam is located. Then if you draw a  
12 circle around that, bring that angle back, that's the  
13 manufacturer's specifications in most circumstances.

14 And how that's relevant is that unless  
15 you go and test your radar, which I have done with  
16 our radars, to know what the beam properties actually  
17 are, you're left with the manufacturer's  
18 specifications. But you have got to back up. Radars  
19 aren't meant to detect birds.

20 So the point being that objects can and  
21 will be detected beyond those beam dimensions, the  
22 extent to which is influenced by the distance, the  
23 radar cross-section, the ability of the energy to  
24 bounce back.

25 So I am not disputing was he is saying, I

1 am just qualifying that he's saying given a  
2 theoretical dimension of that beam, the 4-degree  
3 beam, half of it is going to be looking, if you point  
4 it right at the horizon, 2 degrees are going to be  
5 below the horizon. If you are pitching and rolling 2  
6 degrees, you're fine. If you pitch more than that,  
7 the beam -- you are going to lose your track,  
8 theoretically. Hopefully that made sense.

9 Q. It made sense.

10 A. It's just -- he's just expressing what's  
11 understood with the properties of that beam.

12 Q. When it says "VendorA reports," that was  
13 VendorA, as you understand it, reporting to  
14 Dr. Diehl, correct?

15 A. Yeah.

16 Q. Okay. Not to you, right?

17 A. Correct.

18 Q. So you don't know what information  
19 VendorA provided to Dr. Diehl to cause Dr. Diehl to  
20 describe it as "VendorA reports that tracking could  
21 tolerate 2 degrees of pitch or roll." You told me  
22 about theoretical assessments and vendor data --  
23 data. You don't know what bases or foundations  
24 VendorA gave to Dr. Diehl to explain why it was  
25 reporting that tracking could tolerate 2 degrees of

1 pitch or roll; is that correct?

2 A. That's correct. I was just making a  
3 small clarification that radar is not exact. It  
4 might tolerate a slightly larger amount, but  
5 that's . . .

6 Q. And you mentioned you've talked to  
7 Accipiter, correct?

8 A. Correct.

9 Q. Did you talk to them about this issue  
10 that they had reported to Dr. Diehl that their  
11 tracking could tolerate a 2-degree pitch or roll and  
12 that was the extent of the toleration?

13 A. We talked about this issue, which is the  
14 barge movement --

15 Q. Right.

16 A. -- and like I said, the radar is going to  
17 record all the information. The question is how will  
18 the algorithm perform under those conditions.

19 Q. And what testing has been done to make  
20 determinations about that?

21 A. I don't know. That's their equipment.

22 Q. And you have no basis, as a result of  
23 your discussions with Accipiter, to assert that this  
24 report that they made to Dr. Diehl, that tracking  
25 could tolerate 2 degrees of pitch or roll, is

1     inaccurate, correct?

2             A.    No, I don't have any basis to assert that  
3     but, again, you know, this is removing some context  
4     that is also provided in this report that there are  
5     options to mitigate the motion, so. One of those  
6     could theoretically be a gimbal. If they use a  
7     gimbal, then it's not pitching and rolling as much,  
8     or at all, ideally.

9             So I guess I am saying I don't want to  
10    get overly focused on that. I am just trying to  
11    provide -- there are options here which could address  
12    this situation. That's all I am trying to say.

13            Q.    On page 25. "Concerning tracking,  
14    VendorA may consider refitting their radar with a  
15    smaller diameter antenna to increase beam width as a  
16    means of increasing the likelihood of maintaining  
17    tracks." What is your understanding of what  
18    Accipiter's proposal was with respect to the diameter  
19    of the parabolic dish?

20            A.    My understanding is they -- their  
21    proposal is for a 4-degree beam and -- there's  
22    tradeoffs with everything. So I think what Dr. Diehl  
23    is saying is that if you want to -- one way to  
24    address the motion of the barge is to put a smaller  
25    dish which gives you a bigger beam for a parabolic

1 dish. He's saying okay -- I think he said consider  
2 using a 6-degree beam. Fine. Then you could  
3 tolerate 3 degrees of pitch and roll. But, there is  
4 a tradeoff. There is always a tradeoff with  
5 everything. The tradeoff is it's a wider beam, it  
6 has more diffuse energy, you are not going to detect  
7 targets as well.

8 Q. As clearly.

9 A. "As well." Well, detect them as well.  
10 However -- however you want to think about it.

11 Q. Okay.

12 A. You're going -- so the beam dimensions  
13 change the ability to detect the targets which is  
14 the -- you know, that's the main -- that's the main  
15 focus here, so.

16 Q. But my question -- and your explanation  
17 was fine, it's informative, but my question was: Do  
18 you know the width -- the diameter, excuse me, of the  
19 parabolic dish that Accipiter is proposing to use so  
20 that it creates the 4-degree beam?

21 A. Do I know the width of the dish?

22 Q. The diameter.

23 A. I think it's 24 inches, but you would  
24 have to go back and look in the specs.

25 Q. Okay.

1           A.    What's important is the beam -- beam  
2 dimensions which is 4 degrees.

3           Q.    And I was looking for it. I thought I  
4 had seen it but I couldn't find it last night.  
5 Anyway has -- has Accipiter changed the proposed  
6 diameter of the parabolic dish, let's assume it's  
7 24 inches, as a result of Dr. Diehl's report?

8           A.    Not to my knowledge but, you know, the  
9 system isn't in place, and if testing showed that --  
10 I mean, there's tradeoffs like I just explained. If  
11 they decide they want to put a bigger beam on it, use  
12 a bigger beam to address this issue if they thought  
13 that was the most important, then you could.  
14 Tradeoffs.

15          Q.    Okay. And then expert Diehl next says,  
16 "Ideally, a barge pitch and roll test would be  
17 conducted to determine whether and/or how frequently  
18 barge movement would exceed the ability for VendorA  
19 to track." That's a recommendation, you understand,  
20 being made by Dr. Diehl, correct?

21          A.    Yeah. It says "ideally."

22          Q.    Okay. And that testing has not been  
23 done, correct?

24          A.    Not to my knowledge.

25          Q.    Okay. Has Accipiter made any proposal to



1 do such testing?

2 A. I don't know. You would have to talk to  
3 LEEDCo.

4 Q. Okay.

5 A. Not to my knowledge.

6 Q. You've had discussions with Accipiter,  
7 and in your discussions with them you've had no  
8 discussions about them actually doing a test of the  
9 barge to test pitch and roll on Lake Erie; is that  
10 correct?

11 A. No.

12 Q. Okay. Now, page 27. And again, in your  
13 testimony in response to paragraph 19, "What are the  
14 mechanics or logistics of collecting radar data from  
15 VBR?" You state "The radar system intended for use"  
16 and you characterized it as being recommended by  
17 Dr. Diehl in his report. Let's go to page 27. He  
18 states, in the first sentence, "None of the vendor  
19 options satisfactorily" --

20 A. Hold on. I am not with you.

21 Q. Page 27. "Adaptive sampling" down at the  
22 bottom.

23 A. Got it. All right.

24 Q. "None of the vendor options  
25 satisfactorily addresses all the challenges such

1 operations face in an offshore context and in other  
2 settings as well." That's his conclusion, correct?

3 A. Well, that's a statement there, and I  
4 think I understand why he made that statement. And  
5 it goes beyond what we've talked about so far.

6 Q. Okay. And now let's go down to the  
7 bottom of page 28. Expert Dr. Diehl states, the last  
8 sentence on that page, "I am unaware of any vendors,  
9 including those not responding to this RFI, capable  
10 of implementing such a strategy in the near term."  
11 Do you see that?

12 A. I do. But, you know, you're picking out  
13 individual sentences out of, you know, you've removed  
14 all the context, so I would like to read that  
15 paragraph because by just saying that, you're  
16 implying that nobody has got a solution to these  
17 things but we haven't read the paragraph.

18 Q. Yeah, go ahead and read it.

19 A. If I may?

20 Q. Oh, absolutely.

21 A. Do you want me to read it out loud or to  
22 myself?

23 Q. No, you can read it to yourself, starting  
24 with "Adaptive sampling."

25 MR. SECREST: Actually, Mr. Mabee, feel

1 free to start where you feel appropriate.

2 THE WITNESS: Okay.

3 Q. Yeah. I think that's where it starts,  
4 but read whatever you want.

5 A. Okay. Yeah, there's a lot going on here  
6 in this section. I mean, just for the --

7 ALJ ADDISON: Before we continue,  
8 Mr. Stock, I just want to note, on page 26, what was  
9 the heading noted on that page?

10 THE WITNESS: That's exactly what I was  
11 going to say. We are in the "Alternative  
12 Configurations."

13 ALJ ADDISON: And in this section,  
14 Dr. Diehl is suggesting "a couple alternative radar  
15 deployment scenarios that represent advances or  
16 variations on some of the vendor design options"  
17 suggested in the report; is that correct?

18 THE WITNESS: Exactly.

19 ALJ ADDISON: Thank you.

20 MR. STOCK: Yeah, and I will readily  
21 concede that.

22 Q. And then after he -- what you understand  
23 to be in this adaptive sampling, page 27 --  
24 "alternative configurations," you understand these to  
25 be suggestions by this expert of ways in which the

1 methodology could be improved for the purpose of  
2 improving the methodologies, correct?

3 MR. SECREST: Objection to the  
4 characterization.

5 ALJ ADDISON: I'll allow him a little  
6 latitude in his answer.

7 MR. SECREST: Thank you.

8 A. Like the heading says, these are  
9 alternative configurations of radars to address the  
10 issues that have been brought up.

11 What he is -- what he's talking about in  
12 your sentence at the end of page 28, "I am unaware of  
13 any vendors, including those not responding to this  
14 RFI, capable of implementing such a strategy...."

15 Well, when you go back and read that  
16 paragraph, the preceding one, under "Adaptable  
17 Sampling," starting on 27, I mean he makes a great  
18 point and the point is, and I'm looking at page 27,  
19 the bottom, "Target discrimination is a persistent  
20 concern in radar biology, and one of the most common  
21 shortcomings among vendors concerns target  
22 discrimination" blah, blah, blah. It goes on for a  
23 whole page.

24 Q. Yeah.

25 A. In plain English, what he is saying is

1 one of the hardest things to do in radar biology is  
2 to know exactly what you are looking at, right?  
3 Because the signal goes out, it reflects off all  
4 sorts of things, birds, bats, insects, and getting  
5 that right is critical to having viable data, making  
6 any inferences of this study, and certainly is  
7 critical for the assumptions of this study.

8           Now, what the vendor proposed was to use  
9 what's called radar cross-sections. So radar  
10 cross-section is the intensity of the radar signal as  
11 it reflects back off a surface, okay? Radar  
12 cross-section is not dependent on distance. And that  
13 is one option. You could use radar cross-section to  
14 distinguish birds and bats and insects, great.

15           What Diehl is saying is that yeah, there  
16 is a couple other ways to do that too. You can  
17 measure a target's ground speed, which is what all  
18 radars measure, they measure their speed relative to  
19 to the ground. And then you collect weather  
20 information on wind speed and direction, to correct  
21 ground speed for air speed. It's a long way of  
22 saying that we just want to know how fast the birds  
23 are actually flying -- the targets, excuse me, are  
24 actually flying. And then we can look at what's  
25 known on flight speeds of birds, bats, insects, and

1 make our best guess as to what we saw on our radar  
2 screen.

3 And what Dr.-- so what Dr. Diehl did in  
4 his recommendations is say consider adding another  
5 dimension to your discrimination. Consider using air  
6 speed, plus radar cross-section, and the vendors  
7 agreed to that, but that's, you know, outside of the  
8 scope of this.

9 What they talk about on page 28 is the  
10 third scenario which is wingbeat signature. That's a  
11 much more difficult scenario. You have to take a  
12 beam, you have to stop it, you have to allow the  
13 target to dwell in the beam for long enough to get  
14 fine-grain characteristics about the wing beats of  
15 that bird, bat, or insect over time, and then you can  
16 look at figures and try to figure out if that's --  
17 what it is. It's another dimension. It's rarely  
18 done. It's extremely difficult. It's the holy grail  
19 of identification.

20 That's what he is saying. "I am unaware  
21 of any vendors, including those" blah, blah, blah,  
22 "capable of implementing such a strategy...." He's  
23 saying, yeah, none of the vendors propose the  
24 holy-grail scenario for target ID. So that's what  
25 that means. It has nothing to do with what we've

1       talked about so far, but it is very important.

2               Q.     Well, where -- where in the language,  
3       preceding the sentence I read you to -- and I don't  
4       want to be unfair with it.

5               A.     Yeah.

6               Q.     Where in the sentence preceding the one I  
7       read to you, "I am unaware of any vendors, including  
8       those not responding...capable of implementing such a  
9       strategy...." in the language that precedes it, does  
10      he talk about implementing a technology that would  
11      enable the vendor to identify wingbeats?

12              A.     Well, go right -- that same paragraph.  
13      "Consider an X-band radar outfitted with a 6-degree  
14      parabolic antenna and software control over antenna  
15      position in azimuth and elevation. A sampling  
16      strategy that alternates between stationary beam  
17      sampling..."

18              Q.     I see it there.

19              A.     Well, stationary beam sampling is all  
20      about stopping the beam so you can get the target to  
21      dwell enough in the beam, long enough, to get a  
22      wingbeat signature.

23              Q.     All right. Fair enough.

24              A.     And it keeps going.

25              Q.     Okay. Fair enough. I didn't see it.

1 Thank you.

2 A. Yeah.

3 Q. All right. Have you ever had any  
4 discussions with Icebreaker about using a fixed  
5 platform upon which to situate the radar equipment at  
6 the project site?

7 A. Well, we've had conversations about this  
8 debate, I guess, between the fixed platform and the  
9 vessel-based.

10 Q. Have you rendered any opinions regarding  
11 whether or not the likelihood of obtaining  
12 scientifically-valid data would be increased by using  
13 a fixed platform?

14 A. Have we had any discussions about that  
15 point?

16 Q. Yes.

17 A. We've talked about that point, yes.

18 Q. Okay. And has it been your assessment  
19 that the likelihood of collecting usable data, from a  
20 radar unit at the project site, would be enhanced if  
21 the radar unit were placed upon a fixed platform?

22 A. Well, I think we can meet the objectives  
23 of the study on the vessel-based radar. So that --  
24 that's my opinion.

25 Q. Right. But have you ever expressed the



1 opinion that the probability of the radar unit  
2 producing valid data would be enhanced if the unit  
3 were placed on a fixed platform at the project site?

4 A. We talked about the -- the differences in  
5 information that would be collected in the -- you  
6 know, the -- the issues that we discussed here this  
7 morning with the pitched -- pitch and roll on the  
8 barge. So we discussed that, right? I didn't like  
9 put a number on it and say -- they are well aware of  
10 everything I've said today. Does that make -- does  
11 that answer your question?

12 Q. Well, yes. But what I asked is have you  
13 ever expressed the opinion that putting the radar  
14 unit on a fixed platform has had the probability of  
15 enhancing the ability of the unit to produce useful  
16 data?

17 A. I don't think I used those words but I  
18 did state that, you know, putting the radar on a  
19 fixed platform would remove the movement issues that  
20 we have discussed today.

21 Q. Okay. Thank you.

22 A. But I don't think those are -- will  
23 preclude getting viable data for this project.

24 Q. Okay. Let's go to your testimony again.

25 ALJ ADDISON: Mr. Stock, if we are going

1 to be moving forward, I would just want to inquire as  
2 to how much longer you have estimated for cross.

3 MR. STOCK: I've got a while. It might  
4 be a good time for the morning break.

5 ALJ ADDISON: Certainly. Let's go ahead  
6 and take a brief break. We'll reconvene around  
7 11:15.

8 (Recess taken.)

9 ALJ ADDISON: Let's go ahead and go back  
10 on the record.

11 Q. (By Mr. Stock) Mr. Mabee, I would like  
12 you to take a look at Tab NN. That's your Radar  
13 Monitoring Protocol.

14 A. Yes.

15 Q. And we went through the things that you  
16 reviewed. And if you then look back to Tab KK,  
17 Exhibit 9. This is the November 29, 2016, Summary of  
18 Risks to Birds and Bats. That's not listed on things  
19 you reviewed. And I believe you testified to my  
20 questioning that you had not, in fact, reviewed this  
21 report; is that correct?

22 A. I did not, excuse me, read it for the  
23 radar protocol. Hang on a second. I mean, I briefly  
24 read this but.

25 Q. When did you briefly read it?

1           A.    I don't know.  I mean --

2           Q.    Within the last couple of weeks?  Before  
3 you put together your report on June 29?

4           A.    I don't think I read it before the radar  
5 protocol.

6           Q.    Okay.

7           A.    Just, I think, in advance of this -- of  
8 this hearing.

9           Q.    Okay.  Thank you.

10                   Let's go to your written testimony.  
11 paragraph -- Question 15 on page 5.

12           A.    Okay.

13           Q.    It reads: "Will compliance with  
14 Stipulation Condition 22 produce data that could  
15 change the conclusions set forth in the Risks to  
16 Birds and Bats dated November 29, 2016 ('2016 Risk  
17 Assessment') that are attached to Icebreaker's  
18 February 1, 2017 application ('Application') in this  
19 case as Exhibit J?"

20                   And you say, "No.  Additional data will  
21 help inform baseline conditions and address the  
22 behavioral attraction/avoidance questions, but will  
23 not affect the conclusions in the 2016 Risk  
24 Assessment.  To date, there have been no  
25 pre-construction radar studies I am aware of that

1 have predicted risk accurately for wildlife in a  
2 post-construction setting." I read that correctly,  
3 did I not?

4 A. Yes.

5 Q. And then in No. 16, the questions are:  
6 "Does radar predict risk to wildlife? Why or why  
7 not?"

8 And your answer is: "For those of us  
9 that study the interaction between wind turbines and  
10 wildlife, it is accepted that pre-construction radar  
11 is not an accurate predictor of risk. There are many  
12 potential reasons for this, including:  
13 avoidance/attraction of birds and bats; no  
14 correlation between radar passage rates and fatality  
15 rates; and passage rates vary dramatically whereas  
16 fatalities rates are fairly consistent." Did I read  
17 that correctly?

18 A. You did.

19 Q. All right. Now, let's go to your  
20 testimony at Question 30, page 8.

21 Okay. Are you there?

22 A. Yes.

23 Q. "Has there been a study that correlated  
24 pre-construction radar passage rates with  
25 post-construction bird and bat fatality data?"

1                    "No, to my knowledge there has not.  
2       Stantec reviewed 20 wind energy projects in Maine  
3       with pre-construction radar data and  
4       post-construction fatality data and found no  
5       correlation (Stantec 2017)" and it's Attachment  
6       TJM-3, correct?

7                    A.     Yes.

8                    Q.     Okay. Now, you personally have conducted  
9       numerous pre-construction avian radar studies at  
10      proposed wind-turbine project sites, correct?

11                   A.     Yes, lots.

12                   Q.     Okay. And you used X-band radar,  
13      correct?

14                   A.     Correct.

15                   Q.     You charged fees for those services,  
16      correct?

17                   A.     As do we all, yes.

18                   Q.     Okay. How much does a -- such a radar  
19      study, that you perform, normally run ballpark?

20                   A.     It seems to me that would be confidential  
21      information but.

22                   Q.     I am not asking for any particular  
23      client. Just ballpark ranges.

24                   MR. SECREST: You can answer a range.

25                   A.     Could be \$100,000 for -- well,

1 spring/fall study. A typical spring/fall study which  
2 might be 30 to 45 days in the spring. 45 to 60 days  
3 in the fall. Could be more.

4 Q. Is --

5 A. Depends on location. I mean, there is a  
6 lot of things there so.

7 Q. Sure. I am just looking for ballpark.

8 A. Say 100- to 150,000.

9 Q. Okay. And when you do these studies for  
10 project sites, do you normally do both a spring and a  
11 fall?

12 A. Yeah, in most cases.

13 Q. Okay. Now, when you do these studies  
14 with the X-band radar unit at the project site, some  
15 of the data you're attempting to obtain is the flight  
16 direction of birds in the project area, correct?

17 A. Yes.

18 Q. Okay. The flight altitude?

19 A. Yes.

20 Q. Okay. The passage rate?

21 A. Correct.

22 Q. All right. And this data that you're  
23 compiling, you believe, is useful to inform or assess  
24 collision risk for migrating birds, correct?

25 MR. SECREST: Objection. Misstates the

1 testimony.

2 A. No.

3 Q. You don't believe it's useful to assess  
4 collision risk for migrating birds?

5 ALJ ADDISON: You may answer.

6 THE WITNESS: Can I speak?

7 A. No. I believe it provides exposure data  
8 that these studies characterize migration at a site  
9 and that all the data that you mentioned is collected  
10 and it informs us as to what baseline conditions  
11 exist.

12 Q. And that's all?

13 A. Well, yeah, that's all that it's been  
14 useful so far because it hasn't been able to  
15 predict -- to predict risk in a post-construction  
16 setting.

17 Q. So it is not useful for assessing  
18 collision risk; is that what you are telling us?

19 A. That's what I'm telling you and that's  
20 what the study I referenced in my testimony says too.

21 Q. Okay. Now, you personally have never  
22 done any study to attempt to correlate measurements  
23 of a bird passage through a rotor-swept zone of a  
24 proposed project and the degree of collision  
25 fatalities, correct?

1           A.    Not in a pre -- not a pre/post  
2 comparison. I've been involved with a study in a  
3 post-construction-only setting.

4           Q.    Okay. And when you say in a  
5 "post-construction setting," what do you mean?

6           A.    I mean that I was involved in a radar  
7 study that collected all the same information that  
8 we're talking about but at an operational wind farm.

9           Q.    And then compared it to a carcass?

10          A.    Other people compared it to carcass  
11 information.

12          Q.    Okay. But many of the radar studies you  
13 have done have been pre-construction, right?

14          A.    Yeah, almost all of them.

15          Q.    Okay. Thanks.

16                Let's take a look at Tab RR. This is the  
17 document that is Attachment TJM-3.

18          A.    Okay.

19          Q.    And this is the study you're referencing  
20 in your response to Question No. 30 on page 8 of your  
21 report. "Has there been a study that correlated  
22 pre-construction radar passage rates with  
23 post-construction bird and bat fatalities data?"

24                And you state again, "No, to my knowledge  
25 there has not. Stantec reviewed 20 wind energy



1 projects in Maine with pre-construction radar data  
2 and post-construction fatality data and found no  
3 correlation". So this is the study you were  
4 referring to, correct?

5 A. Yes, it is.

6 Q. And for whom was this prepared?

7 A. For whom was the Stantec study prepared?

8 Q. Yes.

9 A. I am going to go back to the title page.  
10 It says "Prepared for: Maine Renewable Energy  
11 Association. Prepared by: Stantec."

12 Q. The Maine Renewable Energy Association is  
13 an industry group that promotes the expansion of the  
14 use of wind turbine energy, correct?

15 A. I have no idea. I had never honestly  
16 looked at who it was prepared for.

17 Q. Okay. Thank you.

18 To your knowledge, was this report peer  
19 reviewed?

20 A. No, not to my knowledge, but I would note  
21 that Stantec has done a lot of radar studies.

22 Q. They certainly have, and they've done a  
23 lot of radar studies for wind-turbine project  
24 developers, correct?

25 A. That's where the need is, so yes.

1           Q.    Okay.  You're not aware of Stantec having  
2   ever done an avian radar study with respect to a  
3   project for any group opposing construction of the  
4   project, correct?

5           A.    No.  But that's not really how it works,  
6   right?  The developer is the one who pays the  
7   consultants to do these studies.

8           Q.    Now, I would like to turn to page 5.  
9   Well, why don't you explain to us, I think this would  
10  help to set the stage, you reviewed this report,  
11  correct?

12          A.    Yeah, this section on the radar  
13  comparison.

14          Q.    When did you first read this report?

15          A.    I don't remember exactly.

16          Q.    Before your radar Monitoring Plan?

17          A.    Honestly, I don't know.  It may have been  
18  after.

19          Q.    Okay.

20          A.    I don't know, remember exactly.

21          Q.    How did you get the report?

22          A.    My colleague.  I'm sorry.  Mr. Erickson.

23          Q.    Thank you.  And you don't recall when he  
24  gave that to you?

25          A.    I don't.  I'm trying to think.  I don't

1     remember exactly when I got it.

2             Q.     Did he give it to you for purposes of  
3     preparing your testimony in this case?

4             A.     No.   I mean, we share information as we  
5     receive it.

6             Q.     Okay.   So what is your understanding of  
7     how this study worked?

8             A.     Well, my -- my understanding is that they  
9     just compared the pre- and -- they looked at studies  
10    where they had done pre-construction radar and then  
11    post-construction fatality monitoring, and they just  
12    posed the question, Does the pre-construction radar,  
13    does the data from that, correlate with the fatality  
14    data from the project where they went on and  
15    conducted the fatality monitoring.

16            Q.     So they took a number of projects where  
17    pre-construction avian radar studies had been done.

18            A.     Yes.

19            Q.     They then went to look for fatality  
20    studies that have been -- had been done on the same  
21    projects, that is, projects for which the  
22    pre-construction radar work had been done, and wanted  
23    to determine whether or not there was a correlation  
24    between some of the data that was found analyzed  
25    during the pre-construction -- as a result of the

1 pre-construction radar and see if there was any  
2 correlation between the number of carcasses they  
3 determined or fatalities they determined pursuant to  
4 the typical carcass study and the adjustments you  
5 make for searching air and all that, correct?

6 A. Yeah, exactly.

7 Q. Okay. Now, let's take a look at page 5.  
8 And they've got a couple of tables there. The first  
9 table at the top is Figure 3-1, "Mean radar passage  
10 rates from pre-construction surveys at Maine wind  
11 projects (proposed and existing)." Do you see?

12 A. I do.

13 Q. Okay. And they list, I think there are  
14 14, as I count them. You can do a quick count if you  
15 don't think that's right. Well, go ahead and confirm  
16 that.

17 A. Yeah, there's 14 in this particular  
18 figure.

19 Q. Okay. Now, the project identified as  
20 Weaver, that was the project with the highest  
21 recorded meet -- mean radar passage rates as a result  
22 of the pre-construction radar study, correct?

23 A. Yeah. It looks like that and Bingham  
24 were very, very close.

25 Q. And then Highland runs third, but a bit

1 behind those two higher ones, correct?

2 A. Correct.

3 Q. All right. Is it not the case that in  
4 this study they could not do any correlation for  
5 those three projects because they did not have  
6 fatality data?

7 A. I didn't go through each study that was  
8 presented in this part and see if it showed up in the  
9 ones on the Figure 3-7 which is where it gets into  
10 the comparison itself. So I can do that if you want  
11 me to.

12 Q. Well, I did not see it. If you want to  
13 spend time to confirm that.

14 A. So I'm looking for Weaver, Bingham, and  
15 Highland.

16 Q. Yes.

17 A. I don't see those in Figure 3-7 and 3-9  
18 which is where we look at the pre- to post-  
19 comparisons for bats and birds.

20 Q. So they have no data to do this  
21 correlation study for the three projects that had the  
22 highest passage rates, correct?

23 A. I guess not. They're not in the  
24 comparison, so I am assuming they didn't have that  
25 information.

1 Q. Okay.

2 A. Yeah, if I may --

3 Q. Uh-huh.

4 A. -- comment? I'm just looking at the  
5 title -- the caption, I'm sorry, for Figure 3-1. It  
6 says "Mean radar passage rates from pre-construction  
7 surveys at Maine wind projects (proposed and  
8 existing).

9 Q. Uh-huh.

10 A. So I guess they're still proposed. I  
11 don't know. At least at the time.

12 Q. Yeah, you don't know if they have been  
13 built or not, correct?

14 A. No, no.

15 Q. Now, if you look at Appendix A, it's  
16 after page 20, they list -- this is the inventory of  
17 the pre-construction and post-construction data  
18 completed -- compiled for proposed and existing  
19 commercial wind projects in Maine. And if you look  
20 at the projects, the first one is Bingham. Who  
21 performed the pre-construction radar study? It's  
22 under the reference in the right-hand column.

23 A. It looks like Stantec Consulting  
24 Services.

25 Q. Okay. On Bowers, who performed the

1 pre-construction radar study?

2 A. Stantec.

3 Q. Okay. On Bull Hill, who performed the  
4 pre-construction radar study?

5 A. Stantec.

6 Q. Okay. At Hancock, who performed the  
7 pre-construction radar study?

8 A. Stantec.

9 Q. Okay. On Highland, who performed the  
10 pre-construction radar study?

11 A. Stantec.

12 Q. On Kibby, who performed the  
13 pre-construction radar study?

14 A. Woodlot Alternatives.

15 Q. Okay. Are you aware that the principal  
16 author, Trevor Peterson, worked for Woodlot before he  
17 went to work for Stantec?

18 A. Yes.

19 Q. Okay. Mars Hill, who performed the  
20 pre-construction radar study?

21 A. Woodlot Alternatives.

22 Q. Okay. Oakfield, who performed the  
23 pre-construction radar study?

24 A. Stantec.

25 Q. Okay. Passadumkeag is how I am going to

1 pronounce that.

2 MS. NAGUSKY: "Passa-dohm-que."

3 MR. STOCK: What is it?

4 MS. NAGUSKY: "Passa-dohm-que."

5 MR. STOCK: "Passa-dohm-queg."

6 MS. NAGUSKY: "Que" not "queg."

7 MR. STOCK: "Passa-dohm-que." No  
8 pronunciation of the "g."

9 Q. Who performed the pre-construction radar  
10 study?

11 A. Stantec.

12 Q. Record Hill, who performed the  
13 pre-construction radar study?

14 A. Stantec.

15 Q. All right. Rollins, who performed the  
16 pre-construction radar study?

17 A. Stantec.

18 Q. Okay. Now, we've got the odd one in the  
19 lot. Spruce Mountain, is that Tetra Tech?

20 A. Tetra Tech.

21 Q. All right. And then Stetson I & II.

22 A. Woodlot Alternatives.

23 Q. And then, finally, Weaver?

24 A. Stantec.

25 Q. Stantec. All right. So, in this report,



1 Stantec was analyzing data that, itself, had  
2 produced, correct?

3 A. Yeah. This is not surprising. I mean,  
4 Stantec is located in Maine. They're a big firm.  
5 They have got a lot of radars and they have done a  
6 lot of this work. So I'm not surprised that all  
7 these projects in Maine have been done by Stantec.

8 MR. STOCK: What Exhibit No. are we on,  
9 somebody?

10 ALJ ADDISON: 17.

11 MR. STOCK: 17. May I approach?

12 ALJ ADDISON: You may. Mr. Stock, you  
13 would like to mark this as Exhibit No. 17.

14 MR. STOCK: I would. Thank you.

15 ALJ ADDISON: Thank you. It will be so  
16 marked.

17 (EXHIBIT MARKED FOR IDENTIFICATION.)

18 Q. (By Mr. Stock) Mr. Mabee, would you  
19 please identify Bratenahl Exhibit 17.

20 A. That's the one you just gave me, I  
21 assume?

22 Q. Yes.

23 A. Yes. This is "A Radar Study of Nocturnal  
24 Bird Migration at the Proposed Mount Storm Wind Power  
25 Development, West Virginia, Fall 2003, Final Report";

1 prepared for Western Ecosystems Technology and  
2 NedPower; prepared by Todd Mabee, Brian Cooper,  
3 Jonathan Plissner, ABR --

4 Q. I'm sorry. I didn't mean to cut you off.

5 A. ABR - Environmental Research & Services,  
6 I worked for 18 years.

7 Q. Okay. And you are listed as the first of  
8 the three people who prepared it. Does that mean you  
9 had a significant role in the study and report?

10 A. Yes.

11 Q. Okay. Describe for us what the study  
12 was, how it was conducted.

13 A. This study was similar to most others,  
14 yet a little bit different.

15 Q. Okay.

16 A. So we had -- I published a paper on this,  
17 by the way, so, in 2006. We had one radar in a  
18 central location. And another radar that was -- they  
19 are all mobile, but that another radar that sampled  
20 other sites in the landscape if you will. But the  
21 focus, you know, one of the main focuses of this  
22 study was to answer the -- the question had been  
23 raised, Do nocturnal migrants congregate along  
24 ridges? We know that phenomenon happens for raptors,  
25 daytime birds, et cetera, but the question was does

1 this happen for nighttime passerines and the thinking  
2 was yeah, maybe this happens. So the study addressed  
3 that by being on a ridge, measuring flight  
4 directions, looking for evidence of reaction to the  
5 ridge.

6 Q. Uh-huh.

7 A. And, in fact, we did not find that; so I  
8 published a paper on that.

9 Q. So one unit was on the ridge. Where was  
10 the other unit?

11 A. It was either on the ridge or down below.  
12 So the ridge, it's like an escarpment. We have  
13 multiple sites on the ridge and then one was at a  
14 lower elevation.

15 Q. All right. And if you turn to page i,  
16 small i. You were using X-band radar, an X-band  
17 radar unit. And in the second bullet point it says  
18 "The primary objectives of this study were to (1)  
19 correct baseline information on flight directions,  
20 migration passage rates, and flight altitudes of  
21 nocturnal passerine migrants at the proposed project  
22 area during fall 2003." That's an accurate  
23 description of a primary objective, correct?

24 A. Yeah.

25 Q. Okay. Now, if you look at the bullet

1 point on the right, the second bullet point down, it  
2 said -- it says "We found no strong correlations  
3 between NEXRAD reflectivity values (representing bird  
4 densities) and radar migration passage rates during  
5 25 nights with comparable data." What does that  
6 mean?

7 A. Yeah, I had forgotten that, to be honest.  
8 One of my co-workers did that analysis. I guess it  
9 means they didn't find a correlation between the data  
10 that we collected and the larger-scale NEXRAD.

11 Q. Okay. Did you believe that the data you  
12 collected, with your X-band radar at the project  
13 site, provided valid measurements of migrant passage  
14 rates?

15 A. I believe it adequately characterized the  
16 migration in that area, yes.

17 Q. Okay. So the data you got from your  
18 X-band radar at the project site, you believed was  
19 valid. And in comparison to that valid passage rate  
20 data you got at the project site, the NEXRAD  
21 reflectivity values showed no strong correlation; is  
22 that correct?

23 A. That's what it says.

24 Q. All right. Now, let's go to the  
25 introduction, the first full paragraph. And I am

1 going to focus your attention down to the last two  
2 sentences, but you can read from the start if you  
3 just want to get context.

4 Have you had a chance to read that?

5 A. Yes, I have.

6 Q. In the last two paragraphs you say,  
7 "Therefore, an understanding of the dynamics of  
8 nocturnal bird migration at specific locations --

9 A. I'm sorry, I'm not --

10 Q. The last two paragraphs or last two  
11 sentences.

12 A. Oh.

13 Q. "Therefore an understanding...." Do you  
14 see that?

15 A. I don't. Are you on page 1?

16 Q. Yes.

17 ALJ ADDISON: It's the very first  
18 paragraph under "Introduction."

19 Q. Under "Introduction" on the left-hand  
20 side.

21 MR. SECREST: May I, your Honor?

22 A. Oh, I'm sorry. Getting a little hungry.  
23 I found it yes.

24 Q. Okay. All right. Thank you.

25 "Therefore, an understanding of the

1 dynamics of nocturnal bird migration at specific  
2 locations is necessary to assess the potential for  
3 bird collisions with tall, human-made structures.  
4 Consideration of nocturnal migration is particularly  
5 important because considerably more birds migrate at  
6 night than during the daytime." That -- that was an  
7 accurate conclusion, right?

8 A. It was not a conclusion, but that's an  
9 accurate statement at that time which is 2003.

10 Q. Okay.

11 A. I think that's the point here is that in  
12 2003, we didn't have much post-construction fatality  
13 monitoring. So the thinking was, as for all  
14 pre-construction studies, that, hey, we need to go  
15 out and collect this pre-construction information and  
16 hopefully it will help us to predict collision risk,  
17 so yeah, at that time.

18 Q. That's fair enough. Let's go through  
19 what else you are were thinking at that time in 2003.

20 A. Sure.

21 Q. Over on the right-hand side, the  
22 paragraph above "Objectives."

23 "We used a portable X-band radar system  
24 to study the main characteristics of nocturnal bird  
25 migration during fall 2003 at the proposed Mount

1 Storm Wind Power Development. Portable X-band radar  
2 systems are well-suited for studying nocturnal  
3 migration patterns at wind power development sites  
4 because they are uniquely able to provide local  
5 information about bird flight heights, direction,  
6 behavior, and passage rates" -- they can provide that  
7 information, correct?

8 A. Yes.

9 Q. -- "that are useful for avian risk  
10 assessments." That's what you said at that time.

11 A. Yeah. Again, in 2003, the thinking was  
12 that all that information would be useful for risk  
13 assessments because the post-construction fatality  
14 data didn't -- didn't really exist --

15 Q. Okay.

16 A. -- very much.

17 Q. Okay. Fine.

18 "Evaluating the potential for avian  
19 collisions with wind turbines is important because  
20 the appropriate siting of wind power facilities is  
21 one of the most important ways to minimize collisions  
22 with birds." You believe that, don't you?

23 A. Yeah, I mean, sure, if we can do studies  
24 and figure out how birds are going to behave on the  
25 landscape, and think that will remain the same after

1 we build the wind farm, yeah, we want to learn how to  
2 site facilities to minimize impacts.

3 Q. Okay. Now, let's turn to page 14 of what  
4 you said in your report. "Predictions of the effects  
5 of" --

6 A. Excuse me. I want to catch up with you.

7 Q. I know where I am going, you don't. I  
8 apologize. Page 14, under "Discussion, Migration  
9 Characteristics."

10 A. I got it, yes.

11 Q. Are you there?

12 A. Yes.

13 Q. "Predictions of the effects of wind power  
14 development on migratory birds are hampered by a lack  
15 of knowledge of patterns of nocturnal migration. We  
16 addressed this paucity of data by documenting some of  
17 the key migration characteristics (flight directions,  
18 timing of migration, passage rates, flight altitudes,  
19 flight speeds) that can be used both to assess the  
20 risk of collision with wind turbines and to describe  
21 general properties of nocturnal bird migration at the  
22 proposed Mount Storm Wind Power development."

23 A. Yeah, I mean all these examples are  
24 pointing out the fact that I said this information  
25 is, you know, important for risk prediction which, in



1 2003, given my state of knowledge, that's what I  
2 thought. Now I think differently.

3 Q. Okay. All right. I just want to go  
4 through what you thought then.

5 A. Sure.

6 Q. And we'll talk about it.

7 ALJ ADDISON: If I could ask a quick  
8 question. At what point did post-construction  
9 fatality data start coming onto the scene to be  
10 considered?

11 THE WITNESS: Well, they were certainly  
12 collecting then. It's more about the extent, like  
13 how much did they have. Mr. Erickson would be better  
14 suited to answer that question as to the volume of  
15 data that was available in 2003 versus, say, now.  
16 But, you know, it was kind of in its infancy, I mean  
17 really. 2000 was when it started, wind started to  
18 pick up a little bit, early 2000. So 2003 there,  
19 wasn't that much known.

20 Q. Well, let's talk about that a second.  
21 Land-based wind-turbine projects, how are fatality  
22 studies done generally?

23 A. For what species?

24 Q. For birds. Carcass studies, right?

25 A. Sure. I mean, big carcass, little

1 carcass, there's a lot of differences.

2 Q. But isn't that typical methodology for a  
3 land-based wind-turbine project, for fatality  
4 studies, you do carcass studies, right?

5 A. Correct, you do carcass searches.

6 Q. And you're not suggesting that carcass  
7 searches had not been performed prior to 2003, are  
8 you?

9 A. No, I am not suggesting that. I'm just  
10 saying that the body of knowledge, in 2003, was  
11 small, relative to what we know now.

12 Q. Okay.

13 A. That's the pint.

14 Q. All right. And now let's go to page 16  
15 and passage rates. Do you see "Passage Rates" on the  
16 left side?

17 A. Yes.

18 Q. "Passage rates are an index of the number  
19 of migrants flying past a location and can be used to  
20 assess the relative importance of sites being  
21 considered for wind power development." That's what  
22 you believed at the time, correct?

23 A. Yes, that's what I believed at the time.

24 Q. You no longer believe that?

25 A. Well, the target rates don't correlate to

1 fatality rates. So that's -- that's the truth.

2 Q. So that's no longer relevant.

3 A. It hasn't worked so far.

4 Q. Okay. Now, flight altitudes, let's go to  
5 that. "Flight Altitudes" on page 17. Let me know  
6 when you're there.

7 A. I am there.

8 Q. Okay. It reads: "Flight altitudes are  
9 critical for understanding the vertical distribution  
10 of nocturnal migrants and are another important  
11 metric used to assess the suitability of a site for  
12 wind power development." That's what you believed at  
13 the time, correct?

14 A. 15 years ago, that's what I thought.

15 Q. You wouldn't have put it in writing if  
16 you didn't believe it, right?

17 A. That's correct.

18 Q. But you no longer believe that?

19 A. No. I think if you want to understand  
20 where to put a wind farm, you should look at  
21 post-construction fatality monitoring data from the  
22 region, to assess known impacts, versus looking at  
23 different aspects of pre-construction data, whether  
24 it's radar or -- pre-construction data, in general,  
25 hasn't been very predictive.

1 Q. Okay.

2 A. And radar is one of those examples.

3 Q. So as we sit here today, you do not  
4 believe pre-construction radar data regarding the  
5 flight direction of birds over a project area is a  
6 factor that is important to consider to determine  
7 risk of -- collision risk?

8 MR. SECREST: Asked and answered. Excuse  
9 me. Asked and answered, your Honor.

10 ALJ ADDISON: I'll allow him to answer.

11 A. Yeah. I think I have answered that. I  
12 don't -- that information characterized -- yeah, it  
13 characterizes the activity at a site, but it can't be  
14 used to predict the fatalities that you expect at a  
15 site.

16 Q. It can't be used to --

17 A. Predict risk.

18 Q. To predict collision risk.

19 A. Correct.

20 Q. So flight altitude -- and I am following  
21 up because we now have this 2003 mindset and today's  
22 mindset and I want to make sure I distinguish between  
23 the two.

24 A. Sure.

25 Q. And so, with your knowledge today, you

1 don't believe the measurement of the flight altitude  
2 of birds, through a project area, by pre-construction  
3 radar, is useful to determination collision risk?

4 A. I don't. And that's why, you know, I've  
5 lived through the heyday of radar studies, right? I  
6 mean, I had my first radar study in '89. First one  
7 on a wind project in '98; 20 years ago. And I've  
8 seen the thinking evolve over time from hey, we  
9 should be able to measure these things and let's hope  
10 it would predict risk. And then we did radar studies  
11 all over the country, right? And that's kind of come  
12 and gone.

13 Most people don't do these studies any  
14 more and the thinking's changed and the information  
15 is changed and now we have post-construction fatality  
16 monitoring data all over the country and that's a  
17 much better predictor of risk. So yeah, I have  
18 seen -- I have been involved with the full cycle of  
19 this thinking.

20 Q. Now, passage rates, your current thinking  
21 is that pre-construction avian radar measurements of  
22 bird passage rates through the project area is not  
23 informative to assess collision risk; is that  
24 correct?

25 A. That's correct. I think, you know, the

1 language, that's where language is key, it will  
2 assess exposure, right? But the difference between  
3 exposure and risk is -- is substantial, right? We  
4 know that they come through but what do we know about  
5 their avoidance or these other factors that make them  
6 prone to collision? Those are the pieces that are  
7 missing.

8 Q. Okay.

9 A. And that you don't get in a  
10 pre-construction radar study.

11 Q. Thank you.

12 MR. STOCK: The last exhibit was 17.  
13 This will be 18.

14 ALJ ADDISON: It will be so marked as  
15 Bratenahl Exhibit 18.

16 (EXHIBIT MARKED FOR IDENTIFICATION.)

17 MR. STOCK: Thank you.

18 ALJ ADDISON: And just for the record,  
19 Mr. Stock, this appears to be Attachment TJM-1 to  
20 Mr. Mabee's testimony; is that correct?

21 MR. STOCK: Yes, thank you, and that's  
22 helpful.

23 Q. (By Mr. Stock) Mr. Mabee, this exhibit,  
24 our Exhibit 18, TJM-1, is the résumé you attached  
25 showing your expert qualifications in connection with

1 the testimony that you have proffered here in this  
2 case, correct?

3 A. Yes, this is my résumé.

4 Q. Okay. And turn to the second page, Radar  
5 studies, 1998 to 2015. "PI," does that mean  
6 principal investigator?

7 A. Yeah.

8 Q. "PI/co-principal investigator or data  
9 analyst on 58 renewable energy" and then you have  
10 wind, states, et cetera, "that used radar and/or  
11 night-vision optics to document" flight direction,  
12 correct?

13 A. Yes.

14 Q. Flight altitude, correct?

15 A. Yes.

16 Q. And passage rate, correct?

17 A. Yes.

18 Q. Of Marbled Murrelets, right?

19 A. Yes.

20 Q. Diurnal migratory birds, correct?

21 A. That's correct.

22 Q. And nocturnally-migrating birds and bats  
23 to assess collision risk; isn't that what it says?

24 A. It does. It looks like I made the very  
25 mistake that I called out in the Stipulation. I

1     should have used "exposure."

2             Q.     But the language you used and you  
3     submitted to this Board to establish your expertise  
4     in siting these studies says that they -- this  
5     information was gathered to assess collision risk.  
6     Isn't that what you told the Board in this?

7             A.     It was assessed at that -- you have got  
8     to realize -- look at the dates on that, 1998 to  
9     2015. As I just said in my -- for the Mount Storm  
10    2003 example, that was the thinking at that time.  
11    That's the language that I used, that's the language  
12    that it says in my résumé, but I think clarified my  
13    position on that statement.

14            Q.     Well, this has 1998 through 2015. So  
15    right up to 2015 this was accurate, right?

16            A.     No, that's not.

17            Q.     Oh, okay.

18            A.     If this is called -- you've got a résumé  
19    with a stock piece of language and you just keep  
20    adding up the numbers and it's -- that's an honest  
21    oversight.

22                   MR. STOCK: No further questions.

23                   ALJ ADDISON: Thank you, Mr. Stock.

24                   Let's go off the record for a moment.

25                   (Discussion off the record.)



1 ALJ ADDISON: Let's go ahead and go back  
2 on the record.

3 Mr. Simmons.

4 MR. SIMMONS: Thank you.

5 - - -

6 CROSS-EXAMINATION

7 By Mr. Simmons:

8 Q. Mr. Mabee, my name is Cameron Simmons.  
9 I'm with the Ohio Attorney General's Office, and I  
10 represent Staff in this matter.

11 ALJ ADDISON: Mr. Simmons, would you mind  
12 just turning on your microphone. I'm sorry. Thank  
13 you.

14 MR. SIMMONS: Thank you.

15 Q. You indicated earlier that you became  
16 involved with this project and, in particular, began  
17 your employment with WEST earlier this year, correct?

18 A. Correct, February 2018.

19 Q. There's been some discussion about a  
20 fixed platform versus vessel-based radar. Has the  
21 Applicant made a final decision to use one method or  
22 the other?

23 A. Not to my knowledge. I don't know.

24 Q. There's been a lot of discussion about  
25 the vessel-based radar. Have you had any

1 conversations with potential vendors for a barge  
2 system?

3 A. I had a conversation with Accipiter,  
4 referred to as "VendorA" in the Diehl Report, but not  
5 any barge person or company.

6 Q. Does Accipiter operate the barge or just  
7 the radar system?

8 A. Sorry. Accipiter just would provide the  
9 radar.

10 Q. I want to talk a little bit about the  
11 configurations of the barge or vessel upon which the  
12 radar would be mounted. It would be at the project  
13 site, correct?

14 A. That's my understanding, yes.

15 Q. So approximately 8 to 10 miles offshore  
16 from Lake Erie, correct?

17 A. I'm assuming so, yes.

18 Q. And how would that be affixed to the  
19 lakebed?

20 A. I have no idea. I don't know anything  
21 about the barge. I would assume you talked to Dave  
22 Karpinski, Mr. Karpinski, or someone from Icebreaker  
23 can answer that question. I haven't had any  
24 discussions about the barge or details or how it  
25 works, so I don't know.

1           Q.    Mr. Stock was questioning you about  
2 potential movement of the barge, and I believe you  
3 indicated there was pitch potentially, roll  
4 potentially, and what was the third item?

5           A.    Yaw.   Y-a-w.

6           Q.    Yaw.   And that's essentially the spinning  
7 of the barge?

8           A.    Correct.

9           Q.    Could there be any horizontal movement of  
10 the barge on the lakebed -- or on the surface of the  
11 water?

12          A.    I don't know.

13          Q.    If there was horizontal movement, would  
14 that affect the reliability of the radar data?

15          A.    I don't think so.   I mean -- you know,  
16 I'm just -- that's going to be such a small degree of  
17 movement that that's not going to make any difference  
18 from the radar data.

19          Q.    I would like to go over some of the  
20 possibilities that could result in the loss of  
21 collection of reliable radar data.   And you've  
22 previously mentioned a few of them, so one of them  
23 was wave clutter, correct?

24          A.    Yeah.   Sea clutter, wave clutter; same  
25 thing.

1           Q.    And I believe your testimony was that  
2           that could be -- become more of a problem due to  
3           potential movement of the barge because the radar  
4           could -- could fluctuate, pick up the returns from  
5           the wave clutter, is that correct, as the radar bands  
6           move up and down?

7           A.    Yeah, the -- the sea clutter issue is  
8           exacerbated, to some degree, by the motion of the  
9           barge. But, like I said, there are ways to try to  
10          address that.

11          Q.    And I believe another issue you talked  
12          about due to the movement of the barge was hitting a  
13          target on one round of the radar and then, on the  
14          next return, the radar band has moved, so you would  
15          miss it on the next return; so that would be another  
16          potential area where you could have unreliable data,  
17          correct?

18          A.    I don't know if I would go so far to say  
19          "unreliable data." It's just acknowledging -- it's  
20          acknowledging how that radar could work out there,  
21          right, under different conditions. So I'm just  
22          stating it could -- it could make the track  
23          identification more difficult, but not necessarily  
24          impossible, right? There might be more manual review  
25          of the data that would be needed to put that track

1 together than what an algorithm might be able to do,  
2 for example.

3 Q. But if it misses the target, wouldn't  
4 that be a loss of data?

5 A. Yeah, but it's about -- data isn't  
6 collected on an individual target. It's kind of  
7 confusing to say that. The information will be  
8 collected on a track of targets, a track of targets  
9 or a track of echos on your screen. So the question  
10 is, you know, how can you -- the challenge is to make  
11 sure you're accurately stitching those tracks  
12 together, if you will, and if there's motion, that  
13 could be more challenging.

14 Q. And I may be oversimplifying this but,  
15 for example, one round of the radar could show seven  
16 birds, the next round could show only five, because  
17 two of them were missed due to wave -- due to the  
18 motion of the barge. Is that a very simple  
19 explanation?

20 A. Yeah. And then the subsequent round  
21 would pick them up again and then they disappear and  
22 then you pick them up again. So it's not that you  
23 don't see them, it's not that you don't record it,  
24 it's just that you might need a differential  
25 algorithm to put the tracks together during wavy

1 conditions versus calm conditions.

2 Q. And just to follow-up on that example, in  
3 subsequent rounds though the number could be six or  
4 eight, correct? I mean, it may pick up a different  
5 number each time? It may not just go 7, 5; 7, 5; 7,  
6 5; correct?

7 A. Well, if the birds were at the same  
8 altitude, that number would not vary. Well, that  
9 number would likely not vary. Right. So the number  
10 is not going to change. What will change is its  
11 ability to detect them. Either it gets them, or it's  
12 pointing down in the water and can't see them, and it  
13 points back up and it gets them, so.

14 Q. How -- how high off the top of the barge  
15 would the radar dish be?

16 A. I don't know exactly. I would have to  
17 see the setup. And you would -- that location -- the  
18 altitude, in part, would be -- well, you would have  
19 to test it with the sea clutter to see how to -- how  
20 to minimize sea clutter conditions. So it might be a  
21 little counterintuitive. You might want to bring the  
22 radar down and build what's called a "radar fence"  
23 which is just a structure to clip, if you will, the  
24 low-elevation energy that's going to hit the waves,  
25 in this case, that you don't want -- you don't

1 want -- you don't want returns from the waves. So  
2 you might be able to build a fence around that system  
3 that would clip those off. I've done a lot of this  
4 kind of thing using natural topography with our  
5 mobile radars to do the very same thing, to remove  
6 those low-energy waves to minimize ground clutter.

7 Q. Do you have an estimate of how far it  
8 would be? Are we talking 20 feet? 50 feet?  
9 100 feet? How high?

10 A. The radar itself?

11 Q. Yes.

12 A. No. I don't know for sure. I mean, it  
13 may say in the RFP in the Diehl Report. I'm going to  
14 say a few meters. I don't think it's going to be way  
15 up there. I don't think we want it way up there. I  
16 think we want it within a few meters of the barge  
17 deck.

18 Q. And another possible item that would  
19 result in not collecting viable data would be any  
20 maintenance issues or power outages for the radar  
21 system itself, correct?

22 A. Yes, exactly.

23 Q. If it's not working, it's not going to  
24 collect data.

25 A. You're correct. And I mean that happens.

1 I've certainly had that happen in the radars I've  
2 used. Fish and Wildlife, it looks like in the first  
3 year they produced a report they had 66-percent  
4 viable data at a site. Their system was down for  
5 three weeks. So, you know, these things happen.  
6 It's -- it's technology, right, nothing is perfect.

7 Q. And you've -- in your testimony you've  
8 mentioned that there would be times when the vessel  
9 would have to leave the project area and come into  
10 port, correct?

11 A. Yeah. I don't know exactly if I said  
12 that, but I think, you know, the high -- during the  
13 high -- what we asked for is an allowance during the  
14 high seas. Let me restate that.

15 During high seas, when the barge operator  
16 assumes it's unsafe to have the barge out there, that  
17 would be removed. And so, what we asked for is an  
18 allowance to take that time out of the equation, not  
19 be penalized for that, because we don't control it.

20 Q. So there would be times when the barge  
21 would come off the Lake, correct.

22 A. Yeah, exactly. The seas get too high,  
23 the barge comes off the Lake for safety reasons, and  
24 then we can't collect any data.

25 Q. And to clarify, from the time the barge



1 is being tugged in and while it's in port, the  
2 data -- the radar wouldn't be operating, correct?

3 A. I've never thought about that to be  
4 honest. I've never thought about that. I don't  
5 know. I would assume not. If it's unsafe to be out  
6 there, it's probably going to be moving around a lot  
7 and -- I don't know.

8 Q. I would like to direct your attention to  
9 your prefiled testimony. And specifically page 6 and  
10 your response to Question 21.

11 A. Okay. Just a minute. I have got a lot  
12 of documents here that I need to. Okay. I've found  
13 my prefiled testimony. What number are we on?

14 Q. Page 6, please, your response to Question  
15 21.

16 A. I'm there.

17 Q. Could you read that answer, please, for  
18 the record.

19 A. You want me to read the Question and  
20 Answer or just the answer?

21 Q. Sure, both, please?

22 A. So No. 21. "If high seas were to force a  
23 vessel" -- "If high seas were to force a vessel to  
24 port temporarily, could the Applicant collect radar  
25 data any other way during these periods?"

1           My answer: "Yes, while the vessel is in  
2 port, data could be collected from the NEXRAD station  
3 in Cleveland, which collects weather radar in the  
4 project area."

5           So, yeah, that's the idea is that during  
6 those time periods where we can't collect data,  
7 whether it's removed for high seas or main -- you  
8 know, if it goes down for maintenance, we could  
9 collect the data from the NEXRAD station which, by  
10 the way, is, I mean, this is a really unique  
11 situation to have a NEXRAD station so close with a  
12 good view of the project site. That's -- you know, I  
13 live and work in the west, you don't get that  
14 opportunity; so this is a unique situation as a good  
15 backup.

16           Q.   And so to clarify, though, the radar  
17 affixed to the barge wouldn't be operating and the  
18 NEXRAD radar would be relied upon during that time?

19           A.   Yeah, we're just saying it's a backup.  
20 The NEXRAD, hopefully, won't break down then and it  
21 will be operating and we can get information to  
22 assess the overall migration intensity during the  
23 time periods when the radar is not operational.

24           Q.   Including when it's in port, correct?

25           A.   Including when it's in port, correct.

1           Q.    And -- but the NEXRAD radar doesn't meet  
2   the proposed conditions in the Joint Stipulation in  
3   22, correct? I'll refer you to Joint Stipulation 1.

4           A.    Okay. I have found the Joint  
5   Stipulation. What number are we on?

6           Q.    Page 7.

7           A.    I'm there.

8           Q.    And specifically subsection -- it's  
9   actually 22(d). The NEXRAD radar would not be able  
10  to determine the flight altitude of migrants at  
11  altitudes near or entirely within the rotor-swept  
12  zone. Is that accurate?

13          A.    Yeah, I mean. I think I stated yesterday  
14  the NEXRAD is going to collect data from 114 meters  
15  to like 963 meters, so it will encompass part of the  
16  rotor-swept area and the altitudes above, but not  
17  completely within the rotor-swept zone.

18          Q.    And the NEXRAD radar also wouldn't meet  
19  condition 22(a); is that correct?

20          A.    No, that's not correct. Radar -- the  
21  NEXRAD radar -- NEXRAD radars detect insects, small  
22  birds, big birds, weather, so they can detect a  
23  10-gram bird.

24          Q.    Can they track directional movement of  
25  individuals?

1           A.    No.  NEXRAD's not -- NEXRAD detects  
2   reflectivity, right, and it's reflectivity from  
3   anything in the air space, but it's at a core scale,  
4   so it's not getting individual birds.  It's getting,  
5   you know, flocks of birds if that makes sense.

6           Q.    So it wouldn't -- NEXRAD radar would not  
7   be able to detect and track directional movement and  
8   altitude of individual vertebrae as indicated in  
9   22(a) of Joint Stipulation 1?

10          A.    Yeah, I guess it's -- it's just a little  
11   semantics.  I am just trying to be clear.  The NEXRAD  
12   can detect those sizes of targets, right?  It can  
13   detect insects which are smaller obviously, but it's  
14   detecting -- it's not going to detect a single bird  
15   moving across your landscape.  It's going to detect  
16   lots of those sizes of targets collectively.

17          Q.    And another issue that could potentially  
18   affect the reliability of the radar data would be  
19   precipitation, correct?

20          A.    Yes, exactly.

21          Q.    And that would include all forms of  
22   precipitation, rain, sleet, snow?

23          A.    Rain, sleet, and snow, all would be a  
24   problem.  Fog is not a problem.  And if I may, on the  
25   precip, I think all we're asking for is what's

1 consistent with ODNR guidelines which say that don't  
2 sample during times of precipitation. We're saying,  
3 yeah, we agree. We don't -- we can sample during it,  
4 but we're just saying realistically the data needs to  
5 be removed.

6 Q. I would like to turn your attention still  
7 in Joint Stipulation 1 which is -- the Joint  
8 Stipulation which is Joint Exhibit 1, excuse me. And  
9 page 7, 22(c), and I believe what you just referenced  
10 there was the last parenthetical of 22(c); is that  
11 accurate?

12 A. That's correct. What we're saying here  
13 is that to meet that 80-percent objective, we need --  
14 we would like to remove the things we can't control.  
15 So the amount of precipitation, we can't control that  
16 and, you know, I can say from personal experience  
17 that I've experienced migration seasons where you  
18 have a lot of bad weather and nothing is moving out  
19 there. And I can say that because I actually did use  
20 night-vision goggles to sit out in the rain and  
21 confirm there was nothing moving out there. And then  
22 all the activity happens at the end when the weather  
23 clears. So that's why we would like "unless  
24 precluded by the heavy precipitation" statement.

25 Q. And we've talked, precipitation is all

1 forms of precipitation, including rain, sleet, snow,  
2 but --

3 A. Yeah.

4 Q. -- you excluded fog, correct?

5 A. Yeah, radar works in fog, so we're good  
6 there.

7 Q. And turning to the high seas portion of  
8 that, would that include the loss of data that we --  
9 were associated with high seas relating to the wave  
10 clutter issues and the movement of the barge to --  
11 for lack of a technical term -- the hit or miss with  
12 the various pulses of the radar?

13 A. Yeah. That -- it's written really to  
14 just say high sea events, we're just talking about  
15 whether the seas are high enough to have the barge  
16 removed because of safety. That time we would like  
17 removed from the equation too. Does that make sense?  
18 Only when the barge is removed. Because it's out of  
19 our control. It's the same rationale. The things we  
20 can't control that don't allow us to sample or to  
21 produce viable data, we can't -- we'd like to remove  
22 from that 80 percent. Otherwise, you may not meet  
23 the objective because you just can't, it's a bad  
24 year.

25 Q. And I guess that was my question. Would

1 the rocking of the barge, due to wave action, be a  
2 circumstance that you couldn't control in the context  
3 of the high sea event in that language?

4 A. Well, I am getting a little confused. We  
5 can't control that, but all I am saying as far as an  
6 allowance, we are just saying that when the barge is  
7 removed from the Lake because of high seas, which is  
8 a safety condition, that time we want removed. If  
9 the barge is moving out there and the barge operator  
10 doesn't pull it, well, then, we have to either make  
11 the best out of that data or see if it's viable or  
12 not.

13 And if I may, a slight comment here. You  
14 know, the 80 percent is a little bit hard for me as a  
15 scientist because it's just a number. It's just a  
16 number that doesn't have a scientific basis. It's  
17 not -- it doesn't come from a statistical analysis  
18 that says here is a variation in the phenomenon of  
19 interest and, for that reason, we need to sample this  
20 amount. It's just 80 percent.

21 I personally have published radar  
22 studies, I think, five of them. I worked in the U.S.  
23 and Mexico with the number of nights ranging from 20  
24 to 45, you know, focusing on peak migration, that's  
25 always been the focus of these studies. The wind

1 industry, all X-band radar studies I've been involved  
2 with, people are out there for anywhere from 20 to  
3 60.

4 So just a comment that I don't think we  
5 need 80 percent to meet the objectives of the study  
6 to get you good, useful data, to characterize the  
7 migration, and talk about the rates and talk about  
8 the avoidance. We don't need 80 percent.

9 Q. What would you suggest is an appropriate  
10 floor? 75 percent?

11 A. That's a great question. The 80 percent  
12 is based on huge sampling period. So it's April 1  
13 through June 15, which is, you know, more like a  
14 75-day-ish window. That's longer than I have ever  
15 heard of. That would be longer than any I have ever  
16 known to be done for spring. Fall, similarly, is  
17 very large. It's August 1 to the middle of November.  
18 I mean, those dates encompass migration in totality,  
19 more or less. And if we're just focused on nocturnal  
20 migrants, I would say that window exceeds that.

21 So, I don't know, I don't want to give  
22 you an exact number, but you could have half the time  
23 out there, right? If you had half the time in the  
24 spring, instead of 75 nights, you had 37 nights. I  
25 mean, that's still right in the zone of papers I've



1 published and others have published that characterize  
2 what's going on out there.

3 Q. I don't --

4 A. Just, again, I don't want to give you  
5 like a hard number, but those are just examples that  
6 come from my experience.

7 Q. And to clarify your answer, I want to  
8 make sure, I think we may be talking about two  
9 different things.

10 A. Okay.

11 Q. One of them is the survey period.

12 A. Yes.

13 Q. The number -- the length of that, you  
14 know, the migratory season.

15 A. Right.

16 Q. And the other time is the percentage of  
17 reliable data, correct?

18 A. Yes.

19 Q. So you said half the time. Are you  
20 suggesting that the time could be cut down or that  
21 only a 50-percent threshold would be sufficient?

22 A. I'm just -- I'm just stating that, you  
23 know, I've published peer-review publications  
24 studying really kind of the same thing on 20 to 45  
25 nights, you know. So if you said 50 percent of the

1 time of a 75-day window in the spring, just as an  
2 example, that would be 37 nights. So I'm not -- does  
3 that make sense? I am not saying you change the time  
4 frame we are out there. Those are set. We'll do  
5 that. But the amount of information you might need  
6 to answer the question could be less than 80 percent.  
7 I would like to kind of leave it at that. If that  
8 makes sense.

9 Q. Without giving a specific -- you can't  
10 give a specific number as to what it would be?

11 A. No, I think for the same reason the 80 --  
12 using my own rationale here, it's like you need to do  
13 some sort of analysis to try to figure out how much  
14 information you would need to capture enough  
15 variation to describe what you're trying to do in  
16 this study, and I don't -- I don't certainly -- I  
17 didn't come with that number in my head.

18 Q. Let's talk about the 80 percent a little  
19 more.

20 A. Okay.

21 Q. I would like to direct your attention to  
22 your written testimony, page 7. And particularly  
23 your response to Question No. 23. And the question  
24 was asked "The Stipulation Condition 22(c) states  
25 '80 percent or greater survey time (must produce)

1     viable data.' Can you explain what that means?"

2             A.     I'm sorry, you want me to read my answer?

3             Q.     Yes, please.

4             A.     Sure. "This phrase means that 80 percent  
5     of the time the radar is operating during the  
6     sampling period it must collect viable data."

7             Q.     And as you previously testified, the  
8     radar is not operating during maintenance events?

9             A.     Right.

10            Q.     And it's not operating when it's in port.

11            A.     Correct.

12            Q.     So those times and any other potential  
13     times it wouldn't be operating, would not even be  
14     factored into the 80 percent, correct?

15            A.     That's what we would like, yes.

16            Q.     So if the barge was in port for say 80  
17     hours of its survey time and there were additional 20  
18     hours that the equipment was down for maintenance  
19     reasons, you would have 100 hours where it wasn't  
20     operating during the survey period. Your testimony  
21     is that those 100 hours would be taken off both the  
22     numerator and the denominator when conducting -- when  
23     analyzing the 80 percent, correct?

24            A.     I don't think -- I don't think that's  
25     quite right. If I may clarify. I think what

1 we've -- what we've asked is an allowance for  
2 precipitation. And an allowance for high sea events.  
3 We didn't ask for an allowance for maintenance time.  
4 So if the radar goes down, we will hope it doesn't go  
5 down more than 20 percent.

6 Q. But in your testimony you said the  
7 80 percent would only apply to "the time the radar --  
8 "the time the radar is operating during the sampling  
9 period."

10 A. Yes. Let me read this again.

11 Yeah, I think -- I'm trying to explain  
12 what I mean. I don't know if I have written it  
13 exactly correct. I am trying to say that we just  
14 want -- we are asking for an allowance for the precip  
15 and for the time that the ves -- the barge is removed  
16 because of high seas because of safety. But we're  
17 not asking for an allowance for the time that the  
18 radar may not operate because of its own problem. So  
19 does that clarify what I meant to say? Because it's  
20 a little confusing.

21 Q. Let me ask you this: For this -- for  
22 this equation, we'll take maintenance out of the  
23 equation, just focus on the time the barge is in  
24 port. Would that time be counted against -- would  
25 the 80 percent be determined after that time is taken

1 "off the top"? Would the time the barge is in port  
2 be taken off the top, then you would look at the time  
3 the radar was out there and determine the 80 percent?

4 A. Yes, exactly.

5 Q. Okay. I would like to turn your  
6 attention to the Diehl Report. I believe it's  
7 Icebreaker Exhibit 37.

8 THE WITNESS: Can somebody  
9 cross-reference that for the tabs?

10 MR. STOCK: QQ in your binder.

11 THE WITNESS: Thank you.

12 Q. And -- I will wait until you find that.

13 A. I'm there.

14 Q. And I would like to turn your attention  
15 to page 24 of the Diehl Report.

16 A. Yup, I'm at page 24.

17 Q. And I would like you to read, I believe  
18 it's the last full sentence of the partial paragraph  
19 at the top of the page. It begins with "Arguably,  
20 the most important data criteria...."

21 A. Sure.

22 "Arguably, the most important data  
23 criteria for a radar system in relation to the  
24 Icebreaker Wind project concern the ability to gather  
25 data on altitude-specific MTR" -- migration traffic

1 rate -- or density and behavioral response to turbine  
2 presence (pre- versus post-construction comparison to  
3 attempt to assess avoidance/attraction), and the  
4 ability to do so with high reliability (greater than  
5 80 percent of the available time) while avoiding  
6 contamination by clutter, primarily from insects and  
7 the lake surface."

8 Q. So Dr. Diehl uses the 80-percent  
9 standard, correct?

10 A. Well, Dr. Diehl -- I mean that's what he  
11 wrote. I am not disputing that. My understanding is  
12 that Dr. Diehl is just using the parameters he was  
13 given in the RFI, the request for information, that  
14 went out to the vendors. And I think the 80 percent  
15 came from Fish and Wildlife. That's the number they  
16 want. So he's just saying he's just reiterating that  
17 number. I don't believe that he's stating that he  
18 thinks this is needed. That's my interpretation.

19 Q. And you mentioned that Dr. Diehl is a  
20 respected expert in this field?

21 A. Absolutely.

22 Q. And he didn't suggest that a different  
23 percentage should be used, did he?

24 A. Not to my knowledge but, again, they  
25 started in February of 2008, so I was not involved in

1 any discussions with Dr. Diehl. I just read the  
2 report when I got here, so I don't know if he  
3 provided any numbers, but there are none provided in  
4 this document. He wasn't asked the question how much  
5 data do you need to collect to produce viable data to  
6 answer the objectives of this study. He was asked  
7 the question, given these objectives and parameters,  
8 tell me which is the best vendor.

9 Q. Have you -- do you know Dr. Diehl?

10 A. Do I? Yeah. He's a colleague. I've  
11 known him for a lot of years.

12 Q. And have you spoken to him since he  
13 authored this report?

14 A. No, I have not.

15 Q. Okay.

16 A. You know, let me think. I have spoken  
17 with him at a conference, but it may have been -- I  
18 didn't know this report existed.

19 Q. Have you discussed this report with him?

20 A. I have not.

21 Q. Have you had any e-mail communications  
22 about this report?

23 A. No, none whatsoever.

24 Q. You mentioned that you were speaking --  
25 you've had contact with representatives from

1     Accipiter; is that correct?

2             A.     Yes.   I spoke with one person from  
3     Accipiter.

4             Q.     Was that after the Diehl Report was  
5     issued?

6             A.     Yes.   It was this year.

7             Q.     Okay.  Did anyone from Accipiter make any  
8     representations to you about the ability to meet the  
9     80-percent standard?

10            A.     We discussed the standard.  And I  
11     think -- ideally they wanted -- they were comfortable  
12     with the standard from an operational standpoint,  
13     i.e., the radar would operate.  They felt the radar  
14     would operate at least 80 percent of the time.  But  
15     that doesn't leave us any allowances for anything,  
16     right?  You know precip, just data that doesn't  
17     meet -- that's not viable.  So that was the sense I  
18     got from them that this 80-percent standard would be  
19     appropriate for kind of a radar operation, like, the  
20     radar actually working perspective.

21            Q.     Was the -- do you know if the concept of  
22     the barge coming off the Lake in high sea events, was  
23     that conveyed to Dr. Diehl?

24            A.     I have no idea.  Like I said, I didn't  
25     have any communication with him.



1 Q. Was that concept conveyed to Accipiter?

2 A. Well, we certainly talked about the --  
3 the high seas and just the whole 80-percent thing.  
4 So I think they are aware that if it's on a  
5 vessel-based -- if it's vessel-based, on a vessel  
6 moving, a barge, that there could be conditions where  
7 it would have to come in because of safety.

8 Q. You said you think they are aware. Do  
9 you know that they are aware?

10 A. Do I know they are -- I'm sorry, rephrase  
11 the question or ask me again.

12 Q. In your answer you said I think they  
13 would be aware of that. Do you know whether the  
14 concept of the barge coming off the Lake was conveyed  
15 to Accipiter?

16 A. I'm not positive. I don't.

17 Q. Do you know if the concept of the barge  
18 coming off the Lake was conveyed to U.S. Fish and  
19 Wildlife Service?

20 A. I've had no communication with Fish and  
21 Wildlife Service, so I have no idea.

22 Q. Do you know if the concept of the barge  
23 coming off the Lake was conveyed to Ohio Department  
24 of Natural Resources?

25 A. I'm trying to think. I'm pretty sure,

1     you know, because we had conversations with Erin  
2     Hazelton about this, throughout the development of  
3     this Radar Monitoring Protocol, the issues, the  
4     concerns over the 80-percent. I'm pretty sure she is  
5     aware of it, that it could be a scenario that the  
6     barge would have to come in.

7             Q.     Did you personally convey that  
8     information to her?

9             A.     Well, I was leading the efforts for the  
10    Radar Monitoring Protocol or I led the efforts to  
11    develop the Radar Monitoring Protocol, so I  
12    definitely had direct communication with her on all  
13    these topics. I just can't remember did I say  
14    exactly. I am pretty comfortable, yes, that -- yes,  
15    she's aware that there -- she's aware there could be  
16    high sea conditions that would cause the vessel to  
17    come in.

18            Q.     And you're sure of that as you testify  
19    today?

20            A.     Yeah, I am. I feel pretty good about  
21    that.

22            Q.     And when was that information conveyed to  
23    ODNR?

24                   MR. SECREST: Your Honor, if I may just  
25    interject here because some of those discussions were

1 in the context of negotiations related to the Joint  
2 Stipulation. So I would prefer that you not disclose  
3 any conversations related to negotiations with ODNR.

4 ALJ ADDISON: Thank you, Mr. Secrest.

5 MR. SECREST: Unless so instructed by the  
6 Bench, of course.

7 ALJ ADDISON: Thank you.

8 MR. SIMMONS: Could I pose a new  
9 question?

10 ALJ ADDISON: You may.

11 Q. (By Mr. Simmons) The Radar Monitoring  
12 Protocol, that's attached to your testimony, correct?

13 A. Yes.

14 Q. And I believe the date on that is  
15 June 29, correct?

16 A. I would like to look at that if I may.  
17 Can you direct me to that?

18 Q. Sure. It's attached to your written  
19 testimony. I believe there may have been another  
20 copy introduced, but I am not positive I have that.

21 A. Okay. I have got the one attached to my  
22 testimony.

23 Q. And when is that dated?

24 A. June 29, 2018.

25 Q. And has this been approved by ODNR?

1           A.    Well, I think where it was left was -- I  
2   don't think officially, no.

3           Q.    And using that June 29 date as a  
4   reference, was ODNR informed of the barge could come  
5   off the Lake before the June 29, 2018, date?

6           A.    I don't remember, to be honest.

7           Q.    I would like to turn in your -- can you  
8   turn in your testimony to page 3 and your response to  
9   Question 11.

10          A.    Okay.

11          Q.    The beginning of the sentence states  
12   "Based on our extensive discussions with ODNR," and  
13   then the sentence continues "the 80 percent  
14   standard." Is that pretext -- what's the context of  
15   that answer? Are you conveying that these are WEST's  
16   opinions or Icebreaker's opinions that the 80 percent  
17   standard would be met including, however, the  
18   exception for heavy seas, or are you representing  
19   that's the joint position of the Company and ODNR?

20          A.    No, I'm not implying we're representing  
21   ODNR. That -- that would be a WEST and Icebreaker  
22   position.

23          Q.    Thank you for that clarification.

24                Do you have any estimation of how often  
25   the -- the events of the barge being removed from the

1 Lake would occur? Do you have any estimate of the  
2 frequency of that?

3 A. I believe Mr. Karpinski testified to  
4 that, and I think he said 8 percent.

5 Q. I am asking if you have any --

6 A. Oh, me personally?

7 Q. Yes.

8 A. No, I have no idea.

9 Q. I would like to direct your attention to  
10 Staff Exhibit 2. It's a December 21, 2017, letter.

11 A. All right.

12 THE WITNESS: Can somebody  
13 cross-reference me?

14 A. I'm sorry. I am looking at December 21,  
15 2017, to Dr. Diehl?

16 Q. Yes. Are you familiar with this letter?

17 A. Let me take a look. Just give me a  
18 minute. I want to check something.

19 Q. Excuse me. Are you looking at other  
20 documents other than the Staff Exhibit 2?

21 A. What I wanted to do was just look at the  
22 Radar Monitoring Protocol because I listed all the  
23 documents that I had gone through. Pretty sure I  
24 have gone through this one; is that okay to do, or  
25 not?

1           Q.    If it helps you determine if you've seen  
2 the December 21, 2017, letter, you can look at your  
3 draft of the Radar Monitoring Protocol.

4           A.    I would like to do that just to -- I am  
5 just trying to find it.

6           MR. STOCK:  NN.

7           THE WITNESS:  Excuse me?

8           MR. STOCK:  NN in your binder.

9           THE WITNESS:  Thank you.

10          A.    Okay.  This letter is not on my list.  
11 That is the list for Radar Monitoring Protocol.  I  
12 don't honestly remember if I've seen this.  I mean,  
13 parts of the language are things that I'm certainly  
14 familiar with, but I'm not sure.  What's the  
15 question?

16          Q.    All right.  On page 3 of the letter,  
17 there's the sentence -- and I believe this is  
18 pertaining to a possible exclusion due to weather  
19 events, and it reads, and I'm in the first full  
20 paragraph on page 2 of this exhibit about two-thirds  
21 of the way through, "Second, the 'when weather  
22 permits' criteria is arbitrary and could result in  
23 the lack of informative data."

24          A.    I'm sorry.  I haven't found out -- oh,  
25 there we go.  I'm with you.  Yeah, I haven't read

1     this letter.

2             Q.     Do you agree with that statement?

3             A.     I need to read this letter if I want  
4     to -- let me rephrase this. I would like to read  
5     this letter before I provided a comment; is that  
6     okay?

7             ALJ ADDISON: If he hasn't seen this  
8     letter.

9             A.     Yeah. I don't think I've seen this  
10    letter. This is not --

11            Q.     Do you agree with the statement that  
12    allowing weather conditions to be an exception could  
13    be arbitrary?

14            A.     I am not exactly sure what that means to  
15    be honest. You know, I think all we're saying is  
16    ODNR has got it in their protocol to not sample  
17    during heavy precipitation. We're saying, hey, let's  
18    not -- let's not have heavy precipitation be counted  
19    against us. So it's consistent with their protocol.

20            ALJ ADDISON: What protocol do you keep  
21    referencing?

22            THE WITNESS: That's the ODNR Wildlife  
23    Study Guidelines 2009.

24            ALJ ADDISON: That's referenced in your  
25    Radar Monitoring Protocol.

1 THE WITNESS: Yes.

2 Q. (By Mr. Simmons) And who would make --

3 MR. SIMMONS: Excuse me. Were you  
4 finished, your Honor?

5 ALJ ADDISON: Yes.

6 Q. Who would make the determination on when  
7 participation events -- is it a matter of shutting  
8 the radar down or just a matter that the data is  
9 unreliable?

10 A. The dadar -- the dadar. I am getting  
11 tired. The radar would collect data throughout the  
12 precipitation, so it would operate and collect the  
13 information so that would be a, you know, after the  
14 sampling, we would go through that and say we can't  
15 use this information. It's just solid radar. It's  
16 solid rain. You can't see any -- the problem is you  
17 can't -- I can't peel back rain and find birds, so if  
18 your screen is just saturated with rain, you can't --  
19 you can't tell what's going on.

20 Q. And I believe you mentioned that the  
21 decision on when the barge would come in would be at  
22 the discretion of the operator, correct?

23 A. Correct.

24 MR. SIMMONS: No further questions.

25 ALJ ADDISON: Thank you, Mr. Simmons.



1 Do you have any redirect, Mr. Secrest?

2 MR. SECREST: Quite a bit, your Honor.

3 ALJ ADDISON: Thank you. Then I feel  
4 it's appropriate to take our lunch break at this  
5 time. Let's reconvene at 2:00 o'clock.

6 (Thereupon, at 12:57 p.m., a lunch recess  
7 was taken.)

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1 Thursday Afternoon Session,  
2 September 27, 2018.

3 - - -

4 ALJ ADDISON: Let's go back on the  
5 record.

6 Mr. Secrest, redirect.

7 MR. SECREST: Thank you, your Honor.

8 - - -

9 REDIRECT EXAMINATION

10 By Mr. Secrest:

11 Q. Good afternoon, Mr. Mabee. Feeling a  
12 little better after lunch?

13 A. Absolutely.

14 Q. Great. There's been a lot of technical  
15 discussion, which isn't too surprising given we are  
16 talking about radar. But in laymen's terms or  
17 parlance, is this vessel-based radar study going to  
18 work?

19 A. Yes. I think so. I think we've got the  
20 right equipment and the right approach and the right  
21 mitigation that's needed to handle any issues that  
22 have been discussed and yes, I think it will work.

23 Q. All right. So do you believe that it is  
24 likely to obtain sufficient data from this  
25 vessel-based radar study to meet the study

1 objectives?

2 A. Yes, I do.

3 Q. There's also been a lot of discussion  
4 about perceived negatives related to vessel-based  
5 radar. Are there positive attributes associated with  
6 it?

7 A. Yeah, potentially. I mean, one of the  
8 positives is that with the vessel you could optimize  
9 the location of where the ves -- the vessel and the  
10 radar would be in a post-construction monitoring  
11 session. So there might be situations where the  
12 birds could be migrating through the turbines in a  
13 direction that you want to be off to the side of the  
14 wind farm to get the best look at them to see their  
15 behavioral avoidance or reaction to the turbine. So  
16 there is some benefit to being able to move that  
17 vessel if need be.

18 Q. Some of your background was run through  
19 during cross-examination. Did you begin your career  
20 with U.S. Fish and Wildlife Service?

21 A. I had -- did I work for U.S. Fish and  
22 Wildlife Service, yes.

23 Q. And did you also work with USGS?

24 A. I did.

25 Q. For the record who is USGS?

1           A.    The U.S. Geological Survey.

2           Q.    Thank you.

3                   Also some housekeeping matters. During  
4 your cross-examination, at times you referred to  
5 songbirds, at times you referred to  
6 nocturnally-migrating songbirds, and at times you  
7 referred to passerines. Tell us what differences  
8 there are, if any.

9           A.    Well, song -- passerines is a more formal  
10 term for songbirds, your typical small bird species  
11 that you see at your house this time of year. And  
12 nocturnal migrants encompass the songbirds and  
13 passerines, but that terms also encompasses bats,  
14 too. Nocturnal migrants is meant to include both  
15 birds and bats.

16          Q.    Okay. Thank you, Mr. Mabee.

17                   If you would, please, turn to Staff  
18 Exhibit 1. It should be a loose exhibit.

19          A.    Does it cross-reference to any in my  
20 binder?

21          Q.    It's probably in a binder.

22          A.    Oh, the Staff Report? Got it.

23          Q.    Excellent.

24          A.    Yeah.

25          Q.    Please turn to page 24.

1           A.    I'm ready.

2           Q.    Are you on page 24, Mr. Mabee?

3           A.    I am.

4           Q.    Thank you.

5                   The first full paragraph states "The  
6 Applicant has agreed to go forward with vessel-based  
7 radar monitoring as they believe it would provide  
8 suitable information on impacts of the project." Do  
9 you see that?

10          A.    I do.

11          Q.    Do you see anywhere where the Staff  
12 Report objects to vessel-based radar monitoring?

13          A.    No. No.

14          Q.    Do you see anywhere in the Staff Report  
15 where fixed-platform radar monitoring is required?

16          A.    No.

17          Q.    Does Icebreaker bear the risks, if any,  
18 if the vessel-based radar study does not produce  
19 sufficient data?

20          A.    Yes, they do. If you don't get the data,  
21 you can't build the project.

22          Q.    Right.

23          A.    That's my understanding.

24          Q.    There could be costs to Icebreaker if the  
25 vessel-based radar is not sufficient; is that your

1 understanding?

2 A. Yes, absolutely.

3 Q. You also have in front of you Joint  
4 Exhibit 1. It's the Joint Stipulation and  
5 Recommendation. Victor Victor.

6 A. Victor Victor, yes.

7 Q. Please turn to page 6.

8 A. All right.

9 Q. I'm looking at Joint Stipulation  
10 Condition No. 22. And if you wouldn't mind, the  
11 Staff Report you just had in front of you, could you  
12 keep that open as well, but to page 48, please.

13 A. Okay.

14 Q. Thank you.

15 The Joint Stipulation states: "The  
16 Applicant shall implement a radar monitoring  
17 program...." Similarly, the Staff Report states "The  
18 Applicant shall implement a radar monitoring  
19 program...." Do you see that identical language in  
20 both documents?

21 A. Yes, I do.

22 Q. Is radar monitoring both pre- and  
23 post-construction radar?

24 A. Yes, it is.

25 Q. Okay. So in both Staff Condition 22 and

1 Joint Stipulation, excuse me, Condition 22, when  
2 referring to "a radar monitoring program," it's  
3 referring to both pre- and post-construction?

4 A. Yes, that's correct.

5 Q. So if you turn to the next page of Joint  
6 Stipulation 1, looking specifically at paragraph (d).  
7 "Radar must be able to determine flight altitude of  
8 migrants at altitudes near and entirely within the  
9 rotor-swept zone at the project site to quantify  
10 collision risk." Is there any limitation in that  
11 paragraph related to just pre-construction radar?

12 A. No.

13 Q. There was a lot of discussion on  
14 cross-examination related to this 80 percent or  
15 greater standard. Was it your testimony that there's  
16 no scientific basis for that 80-percent standard?

17 A. Yes, that's correct.

18 Q. Mr. Mabee, what is pulse migration?

19 A. Pulse?

20 Q. Yes.

21 A. It just refers to a large number of  
22 individuals coming through at one point in time,  
23 like, during one evening. Or it could be over a  
24 couple of days.

25 Q. Is it your understanding that

1 nocturnally-migrating songbirds do engage in pulse  
2 migration?

3 A. Yeah, yes.

4 Q. So if we're looking at a period of, say,  
5 60 days, and we're looking for migration activity,  
6 that migration activity you would not anticipate to  
7 be uniform each night throughout those 60 days, would  
8 you?

9 A. No, it's never uniform --

10 Q. Okay.

11 A. -- throughout the migration period.

12 Q. So you're not going to get 10,000 birds  
13 day one -- 10,000 night one, night two, night ten, et  
14 cetera.

15 A. Correct. For the nocturnal migrants  
16 we're talking about, that hasn't happened. I have  
17 never seen that in 20 years of studies.

18 Q. Okay. Is it accurate that a majority of  
19 nocturnally -- strike that.

20 Is it accurate that nocturnally-migrating  
21 songbirds and their pulse migration means that a  
22 majority of birds are actually migrating in a short  
23 time period?

24 A. Yeah, during those pulses, you have  
25 really high rates of passage and the birds come



1 through in a short amount of time.

2 Q. So for those 100 nights that you may be,  
3 for example, 100 nights that you may be monitoring,  
4 you could have sufficient viable data for 80 of those  
5 nights but miss the majority of migration; is that  
6 right?

7 A. That's possible, yeah. It could be kind  
8 of extreme but it's possible.

9 Q. So do you believe that Icebreaker can  
10 obtain sufficient data by not meeting that 80-percent  
11 standard?

12 A. I do. Like I talked about in my  
13 testimony, I published on -- published radar studies  
14 in peer-reviewed publications on much less data on 30  
15 to 45 nights so, yes.

16 Q. And is that because even on 30 to 40  
17 nights, you may capture a majority of the migration?

18 A. Yeah. Most of the studies that have been  
19 done are focused on the peak periods to capture the  
20 majority of migration time, not the full extent of  
21 it. So yes, in a 35- to 45-day period, for example,  
22 in spring, you would capture the peak of migration,  
23 the bulk of it.

24 Q. And with regard to the 80-percent  
25 standard, you testified that when the barge is not at

1 the project site, the project will be utilizing  
2 NEXRAD data -- excuse me, NEXRAD radar to obtain  
3 data; is that correct?

4 A. Correct.

5 Q. So can NEXRAD radar provide density of  
6 migration?

7 A. You can -- you get the reflectivity back  
8 from NEXRAD and you can make an assumption and, yes,  
9 get the density.

10 Q. Okay. So if the vessel-based radar is  
11 not at the project site due to high seas, do you  
12 believe that Icebreaker will be able to obtain data  
13 related to the density of migration taking place when  
14 that vessel-based radar is not at the project site?

15 A. Yes, I do.

16 Q. So if the radar -- the vessel-based radar  
17 is not at the project site, Icebreaker is going to be  
18 able to determine what, if any, migration was missed;  
19 is that right?

20 A. Yeah. They'll be able to put it in  
21 context with other NEXRAD data around that time  
22 period.

23 Q. So they will be able to tell if they  
24 missed 1 percent or 2 percent of the migration?

25 A. It would give them some basis to figure

1 out the extent of migration they missed, yes.

2 Q. And did you testify that radar does not  
3 work in heavy precipitation?

4 A. Yes, I did.

5 Q. And that applies to all radar or does  
6 that apply to all radar?

7 A. Everything that we're talking about for  
8 this study, yes.

9 Q. Do birds migrate in the rain typically?

10 A. No. That's an unfavorable condition.  
11 The birds' feathers can get wet, they can get cold,  
12 they can be forced down to the ground, they can get  
13 killed by hail, so those are clearly unfavorable  
14 conditions. So it's not that they don't occasionally  
15 get caught in those conditions, but they are not  
16 going to select to be migrating in the rain.

17 Q. And do you know that from firsthand  
18 experience?

19 A. I do. From spending, I am sure, hundreds  
20 of hours, using night-vision goggles to corroborate  
21 our radar data. So we would sit outside, and I would  
22 make us all sit out there, no matter what the weather  
23 was; rain, shine, precip. And even despite the fact  
24 it's raining, you can still see up into the rotors of  
25 the turbine, and only rarely would you see birds or

1 occasionally bats in those conditions, very rare.

2 Q. When you say "we sat out there," who are  
3 you referring to?

4 A. I'm referring to the employees that  
5 operated the radar at ABR, when it was ABR.

6 Q. And how many total employees was that?

7 A. That were subjected to those conditions?

8 Q. That's right. How many employees really  
9 disliked you?

10 A. Yeah, everybody. Tens of people, I'm  
11 sure.

12 Q. Okay. So these observations that related  
13 to birds not migrating in the rain, weren't just your  
14 observations.

15 A. No, most definitely not.

16 Q. You said birds don't migrate in  
17 unfavorable conditions. What other unfavorable  
18 conditions affect migration?

19 A. Well, high winds. I mean, winds can be  
20 favorable but too strong and not be favorable for  
21 migration. You know, really high winds can cause  
22 birds to drift and that can be a problem for their  
23 orientation. Really strong head winds. So wind  
24 plays a critical role in migration in general.

25 Q. Do you anticipate high winds also causing

1 high seas?

2 A. Yes.

3 Q. So would you anticipate that during high  
4 sea events, the level of migration would be low?

5 A. It would just depend on the intensity of  
6 the wind and direction.

7 Q. And you were asked some questions on  
8 cross-examination about whether the heavy  
9 precipitation phrase contained within 22(c) of the  
10 Joint Stipulation included snow. Do you recall those  
11 questions?

12 A. Yes.

13 Q. Do you anticipate songbirds migrating  
14 when it's snowing outside?

15 A. No, I don't.

16 Q. Why is that?

17 A. They're smart. They are ahead of that.  
18 They'll be able to pass through before those type of  
19 conditions occur.

20 Q. They pass through before winter, correct?

21 A. Before the snow, yeah.

22 Waterfowl definitely can get caught in  
23 those conditions, but I would not expect passerines  
24 to do that.

25 Q. And are you aware that Icebreaker has

1 proposed -- well, the Stipulation proposes a slightly  
2 different standard in 22(g) than the Staff Report?

3 A. I'm sorry. Yes.

4 Q. 22(g).

5 A. Yes.

6 Q. And in 22(g) of the Joint Stipulation it  
7 states: "Radar must collect data for at least two  
8 spring/fall migratory seasons post-construction. If  
9 the Applicant demonstrates to the ODNR's satisfaction  
10 that a second spring and/or fall post-construction  
11 radar survey is unlikely to result in the collection  
12 of additional data to inform the question of  
13 avoidance/attract effects, the ODNR may, in its sole  
14 discretion, determine that the Applicant does not  
15 need to conduct a second spring and/or fall  
16 post-construction radar survey." What is Icebreaker  
17 proposing with regard to this Stipulated Condition  
18 22(g)?

19 A. I think they are just saying that if we  
20 go out in Year 1 and let's say, for example, we -- we  
21 see a real strong response of birds to the turbines,  
22 we characterize their behavioral attraction or  
23 avoidance, then we've documented that and we don't  
24 need to go out an additional year and do it again.  
25 And it gives the ODNR the discretion to say you need

1 to collect a second year of data or not.

2 Q. But your understanding is it is not  
3 Icebreaker's discretion, it's ODNR's discretion,  
4 based upon this language?

5 A. Correct, it's ODNR's discretion.

6 Q. And if you still have Staff -- the Staff  
7 Report in front of you which is Staff Exhibit 1, does  
8 that 22(g) section in the Staff Report provide any  
9 opportunity to forego the second year of  
10 post-construction monitoring?

11 A. No. It says you must collect data for at  
12 least two spring/fall seasons.

13 Q. Regardless if you obtain sufficient data  
14 in the first year.

15 A. Correct.

16 Q. In your cross-examination you were asked  
17 questions or at least responded and addressed the  
18 KCLE NEXRAD station. Are you aware of any ridge or  
19 obstruction associated with the KCLE NEXRAD station?

20 A. No, I'm not.

21 Q. Mr. Mabee, will you please turn to the  
22 Diehl Report, Applicant's Exhibit 37.

23 A. Okay.

24 MR. STOCK: QQ.

25 THE WITNESS: Thank you.

1           A.    All right.  I'm there.

2           Q.    Please turn to page 4.

3           A.    Okay.

4           Q.    Do you see on page 4, under "Data  
5 collection," a reference to 80 percent?

6           A.    I do, yes.

7           Q.    Okay.  It states:  "Automated and  
8 continuous operation during the study period with  
9 data collection occurring during greater than  
10 80 percent of the study period where precipitation  
11 does not obscure data...."  Did I read that  
12 correctly?

13          A.    Yes, you did.

14          Q.    Let's turn to page 24 also.  Okay.  Do  
15 you see another reference to 80 percent?

16          A.    First paragraph, yes.

17          Q.    The full sentence reads:  "Arguably, the  
18 most important data criteria for a radar system in  
19 relation to the Icebreaker Wind project concern the  
20 ability to gather data on altitude-specific MTR or  
21 density and behavioral response to turbine presence  
22 (pre- versus post-construction comparison to attempt  
23 to assess avoidance/attraction), and the ability to  
24 do so with high reliability (greater than 80 percent  
25 of available time)...."



1           The page 4 allotment for precipitation  
2   and the page 24 reference to available time, does  
3   that suggest to you that Mr. -- Dr., excuse me, Diehl  
4   is suggesting that rain, precipitation, or other  
5   events should not be factored into that 80 percent?

6           A.   That's how I read it, yes.

7           Q.   Please turn to page 16 of Applicant's 37.

8           A.   Same report?

9           Q.   Yes, sir.

10          A.   Okay.

11          Q.   I am looking under the "Vendor  
12   Proposals." The second paragraph. Dr. Diehl states,  
13   "...although there is ample precedent for radar-based  
14   scientific data collection on floating platforms at  
15   sea."

16          A.   I'm sorry, where are you at?

17          Q.   I'm in the second.

18          A.   Oh, there you go.

19          Q.   Do you see where I'm at?

20          A.   I'm sorry, I'm with you.

21          Q.   Are you aware of precedent for  
22   radar-based scientific-data collection on floating  
23   platforms?

24          A.   Yes. I mean, Europeans have done it in  
25   the Baltic Sea, for example.

1           Q.   Apparently Dr. Diehl is aware of that  
2 precedent as well. Is that your understanding?

3           A.   Yeah, that's how I read it. It's known  
4 that people collect data from a vessel.

5           Q.   And did you testify that sea clutter is  
6 an issue with fixed platform radar collection?

7           A.   Yeah, it's an issue with fixed or  
8 platform -- fixed or VBR.

9           Q.   And is any other movement, pitching,  
10 yawing, a concern with fixed platform?

11          A.   I don't think so.

12          Q.   Not to the degree, at least, that it  
13 would be with a barge?

14          A.   Correct, yeah.

15          Q.   Rain is a concern for -- regardless of  
16 the platform; is that accurate?

17          A.   That's accurate.

18          Q.   Please turn to page 23 of the Diehl  
19 Report.

20          A.   Okay.

21          Q.   Under "Conclusions." Now, you were read  
22 this on cross-examination. It states: "Far too many  
23 unknowns are present to anticipate the outcome of  
24 radar work in relation to this project." Are  
25 unknowns associated with any radar study?

1           A.    Yes, they are.

2           Q.    Would you expect Dr. Diehl to, in this  
3 report, affirmatively state that a certain radar will  
4 provide viable data?

5           A.    No. His job was to just look at the  
6 different options and pick the best option for a  
7 particular objective.

8           Q.    As far as an affirmative statement that a  
9 certain radar will meet the objectives of this study,  
10 did you anticipate Dr. Diehl would make such an  
11 affirmative statement?

12          A.    No, I did not.

13          Q.    Does it surprise you that he did not?

14          A.    Not at all.

15          Q.    Do scientists make those sort of  
16 affirmative statements?

17          A.    Not generally.

18          Q.    Do you still have Joint Exhibit 1 in  
19 front of you?

20          A.    Let's see.

21          Q.    Victor Victor?

22          A.    Victor Victor, yes, I do.

23          Q.    Page 7, looking at 22(c) again.

24          A.    Okay.

25          Q.    This 80-percent figure, do you know if

1 that's contained in the ODNR guidelines?

2 A. Well, 80 percent isn't, but they say  
3 sample 5 of 7 nights which is 71 percent.

4 Q. When you say "they," are you referring to  
5 ODNR?

6 A. ODNR.

7 MR. SECREST: Your Honor, may I approach  
8 the witness?

9 ALJ ADDISON: You may.

10 MR. SECREST: Thank you. Your Honor, are  
11 we on 40? I think we are on Applicant 40.

12 ALJ ADDISON: I believe that's correct.

13 MR. SECREST: Good.

14 ALJ ADDISON: And just to be clear, this  
15 will be marked as Exhibit No. 40.

16 MR. SECREST: Thank you, your Honor.

17 (EXHIBIT MARKED FOR IDENTIFICATION.)

18 Q. Mr. Mabee, will you please identify what  
19 I have handed you as Applicant Exhibit 40.

20 A. Yes. This is Exhibit A. "On-Shore Bird  
21 and Bat Pre- and Post-Construction Monitoring  
22 Protocol for Commercial Wind Energy Facilities in  
23 Ohio."

24 Q. Okay. And you're familiar with this  
25 document?

1           A.    I am familiar with this, especially the  
2 radar piece.

3           Q.    In fact, it was established on  
4 cross-examination, in the Radar Monitoring Protocol  
5 document you drafted, you referenced reviewing the  
6 ODNR guidelines; is that right?

7           A.    Yes, that's true.

8           Q.    If you will please turn to page 8.

9           A.    I'm there.

10          Q.    You beat me to it.

11          A.    I knew where you were going with this  
12 one.

13          Q.    Page 8, there's a heading "Extensive."  
14 Do you know what that means?

15          A.    Yeah, that's the most -- the category  
16 where you do the most work, the most extensive  
17 studies, intensive.

18          Q.    Well, we can look back towards the  
19 beginning of this document. If you look at page 1  
20 there. There's a bullet point that states "Minimum,"  
21 a bullet point that states "Moderate." Carrying on  
22 to page 2, a bullet point that states "Extensive."  
23 Do you understand what this framework is?

24          A.    Yeah. There's degrees of -- the types of  
25 studies that are needed for different types of

1 conditions.

2 Q. Different types of projects.

3 A. Different types of projects.

4 Q. Is that right?

5 A. Yes.

6 Q. Thank you. And there's minimum,  
7 moderate, and extensive.

8 A. Right.

9 Q. So turning back to page 8, under the  
10 "Extensive" category, Section 3.1, "Radar  
11 monitoring." "Marine radar should be used to monitor  
12 nightly passage rates, 5 nights a week from 15 April  
13 to 31 May, and 15 August to 31 October." Is that  
14 where you derived the 71-percent standard?

15 A. Correct. 5 nights a week, so 5 out of 7.

16 Q. Okay. So under -- is it your  
17 understanding that "Extensive" is the most-stringent  
18 category that ODNR can classify a project?

19 A. Yes, that's my understanding.

20 Q. Okay. And your understanding is these  
21 are guidelines for wind-energy projects; is that  
22 right?

23 A. Correct, yes.

24 Q. So under the most-extensive and stringent  
25 category, ODNR requires monitoring how much percent

1 of the time?

2 A. 71 percent.

3 Q. Okay. Are you aware of any project being  
4 held to an 80-percent standard?

5 A. No.

6 Q. And if you turn to page 9, please, the  
7 last sentence from that indentation. "Due to reduced  
8 detectability, monitoring should not be conducted on  
9 nights of heavy rain or fog." Do you see that?

10 A. I do.

11 Q. Does ODNR advocate radar monitoring when  
12 it's raining, heavy precipitation?

13 A. No, they don't. They are saying it  
14 should not be conducted on nights of heavy rain or  
15 fog.

16 Q. Mr. Mabee, would you please refer to  
17 Bratenahl Residents Exhibit 17.

18 A. Can you cross-reference that to --

19 Q. Probably.

20 A. -- something it relates?

21 MR. STOCK: SS.

22 MR. SECREST: Actually, I can't. It's  
23 not in a binder, correct?

24 MR. STOCK: It's not in the binder.

25 A. Okay. I've got it.

1 Q. Thank you.

2 If you would please refer to Roman --  
3 little Roman numeral i.

4 A. Okay.

5 Q. I'm looking at the third, the bullet  
6 point on the right-hand side. Do you recall being  
7 asked a question about that bullet point on  
8 cross-examination?

9 A. The "key results" or the next row?

10 Q. It states "We found no strong  
11 correlations between NEXRAD reflectivity values  
12 (representing bird densities) and radar migration  
13 passage rates during 25 nights with comparable data."

14 A. I do remember the question.

15 Q. Was that statement specific to this  
16 project?

17 A. Yes.

18 Q. That does not mean that NEXRAD cannot be  
19 used to determine migration density, does it?

20 A. No, it does not mean that.

21 Q. Please turn to be page 1 of the Residents  
22 Exhibit 17. The first full paragraph about halfway  
23 down, maybe a little less than halfway, it states  
24 "Nocturnal migrants also have been recorded colliding  
25 with wind turbines (Osborn et al. 2000, Erickson et



1 al. 2001), although large kills of migratory birds  
2 have not been documented at wind power developments."

3 Is that an accurate statement?

4 A. Yes, it is.

5 Q. Is that still an accurate statement?

6 A. It is.

7 Q. So it's accurate that large kills of  
8 migratory birds have not been documented at wind  
9 power developments?

10 A. Yeah, especially when you look at the  
11 cases where lights had drawn -- where migrants were  
12 attracted to the lights and got killed in the  
13 turbines.

14 Q. And in response to some questioning  
15 related to this document, you explained a little bit  
16 about mortality rates and the progression of data  
17 related to mortality rates. Could you please just  
18 explain how that progression of, or availability of  
19 mortality data has influenced the ornithological  
20 community's -- the wildlife interaction community's  
21 view on collisions and mortality?

22 A. I think now there's so much  
23 post-construction fatality monitoring data which  
24 provides the information on the -- allows one to  
25 estimate the number of fatalities of birds and bats.

1     There is so much of that information available now  
2     that I think it's just recognized that's the  
3     information that's used to assess risk.

4             Q.     And on cross-examination, you said that  
5     you now think differently. Does the industry now  
6     think differently to your knowledge?

7             A.     Yeah. I think that's the case. I mean,  
8     that's why radar studies are -- like I mentioned, I  
9     lived through most of the genesis to the tail end of  
10    the radar studies. They're just -- they're not being  
11    recommended on most wind projects.

12            Q.     You also mentioned on cross-examination  
13    that if you knew the fatality rates for re-- for a  
14    region -- well, strike that.

15                    Did you state on cross-examination that  
16    if you knew the fatality rates for a region, you  
17    could predict risk for birds migrating through that  
18    region?

19            A.     I think I said something to that effect.

20            Q.     With regard to the Icebreaker project,  
21    are you aware of 42 Great Lakes region studies that  
22    were reviewed?

23            A.     I'm aware that that's the number of  
24    studies that were reviewed, yes.

25            Q.     Mr. Mabee, would you please refer to

1 Attachment 2 to your testimony.

2 A. Okay.

3 MR. STOCK: Excuse me, Jon. What is  
4 that?

5 MR. SECREST: I'm sorry.

6 THE WITNESS: The Radar Monitoring  
7 Protocol.

8 ALJ WALSTRA: NN in your binder.

9 MR. STOCK: Now you're speaking my  
10 language.

11 Q. (By Mr. Secrest) Mr. Mabee, in response  
12 to questions related to this document, you referred  
13 to the particular radar being used as the best -- at  
14 least best for this study. Can you explain why?

15 A. Yes, I can. The -- you know, one of the  
16 objectives is to determine behavioral avoidance  
17 effects. So are birds and bats attracted to or do  
18 they avoid wind turbines. And to do that, you really  
19 need data in 3D. And this radar provides that 3D  
20 kind of data to say here's the target, here's the  
21 turbine. That's the only configuration I'm aware of  
22 that would provide that information.

23 Q. In this Radar Monitoring Protocol, about  
24 halfway down the first paragraph under the "Radar  
25 vendor Selection responsibilities," there's a

1 sentence that starts with "Some of the earlier...."

2 Do you see that?

3 A. Yes.

4 Q. "Some of the earlier recommendations on  
5 radar equipment made by USFWS (2017) that are  
6 specific to their radar equipment are no longer  
7 applicable to this project because of the differences  
8 in equipment chosen for this study." When you say  
9 "their radar equipment," what do you mean?

10 A. Well, that's the MERLIN system which is  
11 made by a company called DeTect, and it's a two-radar  
12 system. So it's got their S-band radars; one  
13 operates in the horizontal plane, collecting  
14 information on flight directions; one operates in the  
15 vertical plane, collecting information on flight  
16 altitudes and target densities. And like I mentioned  
17 earlier, you can't -- they sample different layers of  
18 air and you can't combine the information into -- you  
19 can't take the two radars and get 3D data out of it,  
20 so that's a huge difference.

21 Q. And you said DeTect is the manufacturer  
22 of MERLIN.

23 A. Correct.

24 Q. Okay. Has DeTect published any studies  
25 regarding MERLIN being used at wind projects?

1 A. No, not to my knowledge.

2 Q. Turn to page 2 of Attachment 2, please.

3 A. Radar protocol?

4 Q. Yes, sir.

5 A. Okay.

6 Q. Under "Objectives," the first bullet  
7 point states: "The primary general objectives of  
8 radar monitoring for Icebreaker Wind, as set forth in  
9 the Avian and Bat Monitoring Plan and MOU (2017) are  
10 to," and then there's listed 1 and 2. That reference  
11 to "radar monitoring," similar to the Joint  
12 Stipulation and the Staff Conditions, does that refer  
13 to pre- and post-construction radar monitoring?

14 A. Yes, it does.

15 Q. Okay. If you turn back to page 1 of the  
16 radar monitoring. Under the "Radar vendor selection  
17 and responsibilities," the first bullet point, second  
18 full sentence, "In addition, Accipiter incorporated  
19 suggested improvements to its proposed approach made  
20 by Dr. Diehl for the Icebreaker project." Are you  
21 aware that Accipiter incorporated Dr. Diehl's  
22 suggestions from his Diehl Report for the Icebreaker  
23 project?

24 A. Yes, I am.

25 Q. And have you discussed mitigation

1 measures, as you referenced in your  
2 cross-examination, mitigation measures with  
3 Accipiter?

4 A. Yes, we have. We talked about radar  
5 fences, radar-observing material, different options  
6 out there.

7 Q. So are you confident there are options to  
8 deal with any issues that may be unique to  
9 vessel-based radar?

10 A. There are options available to help  
11 minimize sea clutter.

12 Q. Well, is sea clutter unique to  
13 vessel-based radars?

14 A. I'm sorry. No. Sea clutter is common  
15 at -- sea clutter will be an issue for both  
16 vessel-based and the fixed platform.

17 Q. Is heavy precipitation unique to  
18 vessel-based radar?

19 A. No, it is not.

20 Q. So what is unique to vessel-based radar?

21 A. What's unique is its -- its motion during  
22 high seas. And the affect that has on sea clutter  
23 and tracking targets, like I mentioned.

24 Q. So motion is the issue with vessel-based  
25 radar.

1           A.    It's motion.

2           Q.    How can you deal with motion?

3           A.    There are options out there like gimbals  
4 to try to stabilize the whole radar itself or  
5 different instruments to measure the degree to which  
6 the radar pitches and rolls and to correct after  
7 that.  So there are different options out there to  
8 address that motion.

9           Q.    And in your cross-examination you  
10 referenced discussions potentially with LEEDCo  
11 related to using a fixed platform.  Do you recall  
12 whether those discussions related to using the  
13 Cleveland water intake crib as that platform?

14          A.    Yes.  There were discussions about using  
15 the crib.

16          Q.    Mr. Mabee, what are side lobes?

17          A.    Side lobes, first, you start with the  
18 radar coming out of the antenna.  Let's just say the  
19 main direction is just straight out from me.  That's  
20 where the main radar energy is going to go.  Side  
21 lobes are any -- they are smaller amounts of energy  
22 that come out in any direction but the main direction  
23 so.  And what they do is they -- they -- side lobes  
24 are part of the difference between a theoretical beam  
25 shape and the actual beam shape.  So these are things

1     that I've measured with radars that I've used, and  
2     they would cause you to detect objects that are small  
3     and close to the radar because they have low energy.

4             Q.     Do side lobes present issues with bird  
5     detection, negative issues?

6             A.     Well, the negative issue would be if you  
7     haven't actually measured or mapped out your beam  
8     shape, and then you corrected for that without  
9     acknowledging that, you would overestimate the number  
10    of targets at low altitudes.

11            Q.     I'm sorry. You would overestimate the  
12    number at low altitudes?

13            A.     Correct.

14            MR. SECREST: May I have just a moment,  
15    your Honor?

16            ALJ ADDISON: You may.

17            Let's go ahead and go off the record for  
18    a minute.

19            (Discussion off the record.)

20            ALJ ADDISON: Let's go ahead and go back  
21    on the record.

22            MR. SECREST: Thank you, your Honor.

23            No further questions, Mr. Mabee. Thank  
24    you.

25            Thank you, your Honor.



1 ALJ ADDISON: Thank you, Mr. Secrest.

2 Ms. Leppla?

3 MS. LEPPLA: No questions, your Honor.

4 ALJ ADDISON: Thank you.

5 Mr. Stock?

6 MR. STOCK: No questions.

7 ALJ ADDISON: Mr. Simmons?

8 MR. SIMMONS: Yes, thank you.

9 ALJ ADDISON: And please turn on your  
10 mic, if you can.

11 MR. SIMMONS: Sorry about that, your  
12 Honor.

13 - - -

14 RECROSS-EXAMINATION

15 By Mr. Simmons:

16 Q. Mr. Mabee, the spring migratory season,  
17 as defined in the Joint Stipulation, would be April  
18 to mid-June, correct?

19 A. Yeah. April 1 to June 15, correct.

20 Q. Is it possible to have snow in the  
21 Cleveland area in April?

22 A. I don't know for sure.

23 Q. You were asked some questions on recross  
24 about pulse migration and the fact migration is not  
25 uniform, day by day. And I believe you indicated

1 that out of 100 possible nights, it could be possible  
2 to collect sufficient information I believe you said  
3 30 to 40 nights; was that your testimony?

4 A. That's certainly possible, yes.

5 Q. If you pick the right -- right nights and  
6 the peak migrations were during those times?

7 A. If you pick the right nights and/or you  
8 just have the right kind of conditions where  
9 migration was compressed because of extensive  
10 precipitation or unfavorable conditions.

11 Q. And, conversely, if the peak nights were  
12 on those 60 to 70 nights that you weren't doing the  
13 monitoring, wouldn't you not have a complete picture?

14 A. You wouldn't have all the information,  
15 that's true.

16 Q. And would you deem that likely to meet  
17 the study objectives?

18 A. You know, I think to meet the study  
19 objectives you need to have data from a variety of  
20 weather conditions. Clear conditions, cloudy  
21 conditions, winds from different direction, I mean,  
22 you need a variety of -- you want to have data from a  
23 variety of weather conditions to see how birds  
24 respond to it. I mean -- and if you have that, then  
25 I think you can characterize the -- you can meet the

1 objectives of the study.

2 Q. Following up on that, if there were, out  
3 of those 100 days, even a small window, 4 or 5 days  
4 where there was no study, you would have no idea if  
5 zero birds migrated on those evenings or if tens of  
6 thousands of birds migrated on those evenings,  
7 correct?

8 A. That's not correct. We would have the  
9 NEXRAD data to tell us what happened during those  
10 time periods when the project-based radar was not  
11 operating.

12 Q. So you would have to rely on the NEXRAD  
13 radar for that.

14 A. Yeah. You could use the NEXRAD radar as  
15 a context to see, you know, what you missed.

16 Q. But, again, the NEXRAD radar, as you  
17 testified to, doesn't meet the parameters of Joint  
18 Stipulation 22.

19 A. It doesn't meet those exact parameters,  
20 but it does still provide useful information to  
21 provide context on what -- what was missed when the  
22 vessel-based radar wasn't out there.

23 Q. Mr. Mabee, do you know if the Company has  
24 selected a technology for post-collision monitoring?

25 A. No. I've had nothing to do with those

1 discussions. Mr. Good is the person who is doing  
2 that.

3 Q. As you're testifying here today, do you  
4 know if the Company has selected that technology?

5 A. No, I do not know.

6 Q. So you don't know that they have selected  
7 it, correct?

8 A. I don't know either way. Like I said,  
9 I'm not involved with those discussions so that's  
10 not -- not what I'm doing on this project.

11 Q. Would you agree that this is a new  
12 concept, putting a wind facility in Lake Erie?

13 A. Well, it's the first one, so, sure.

14 Q. And as we've discussed, with that  
15 innovative technology, there's a lot of unknowns,  
16 correct?

17 A. Yes. There are some unknowns.

18 Q. Including -- for example, it's not  
19 possible to do traditional carcass searches on the  
20 Lake, correct?

21 A. Correct. But there are other techniques  
22 that have been used to detect collisions. Cameras  
23 have been used for a number of years in offshore  
24 facilities and thermal-imaging equipment has been  
25 used to detect bat collisions. So, I mean, the

1 technology is there to document collisions. I mean,  
2 that -- so it exists.

3 Q. But you've testified you don't know, as  
4 far as the Applicant's concerned, what their plan is  
5 for that technology, correct?

6 A. That's correct. I'm not involved with  
7 those discussions.

8 Q. And additional variables, as you've  
9 discussed in detail today, include -- additional  
10 variables include some of the motion of the  
11 vessel-based radar, correct?

12 A. What do you mean additional variables?  
13 I'm sorry.

14 Q. That the movement of the barge, the wave  
15 clutter, bringing the barge off of the Lake for high  
16 sea events, those could all affect the amount of  
17 reliable data that can be collected, correct?

18 A. They could, but like I said earlier, you  
19 know, there is a huge -- this is the uncertainty in  
20 the project. Picking the right radar is essential  
21 and that, I believe, has been done, and then there's  
22 these other categories that create uncertainty of  
23 which the vessel-based radar is one of those but  
24 it's -- you know, it's a smaller, much smaller  
25 portion of that uncertainty.

1           Q.    Okay.  And taking that uncertainty as a  
2 whole, wouldn't it be better to have two years of  
3 data versus one year of data, all other things being  
4 equal?

5           A.    It depends on what you find in year one.  
6 So I would say if you -- you know, if you go in year  
7 one, get your pre-construction data, and then you get  
8 your post-construction data and if there's a strong  
9 response on the behavioral avoidance or attraction,  
10 if you see clear strong evidence of let's just say  
11 bats being attracted and -- let's leave it at  
12 targets.  This is radar.  Targets being attracted  
13 and/or avoiding structures, then I think you would  
14 have -- you could potentially answer the question in  
15 year one is the only thing I am trying to say, and  
16 then you wouldn't need to go out in year two to  
17 answer that same question because you answered it in  
18 year one.

19           Q.    But during year one, there's going to be  
20 all these variables.  There's going to be  
21 precipitation events that affect radar --

22           A.    Sure.

23           Q.    -- there could be times the barge has to  
24 come off the Lake.  There could be the rocking of the  
25 barge.  There could be pulse migrations where the

1 birds could fluctuate a few days in their migratory  
2 patterns. Whereas, the next year, it may not rain on  
3 the same days, correct?

4 A. Yeah, sure, of course.

5 Q. The barge may be able to be out on the  
6 lake for a period where it had to come in the year  
7 before on the same days, correct?

8 A. Yeah. I don't think it changes my  
9 statement that if you -- you could accomplish the  
10 objectives of the study in year one, that's all I am  
11 saying, you might be able to document this avoidance  
12 and/or attraction issue in year one. And sure, the  
13 conditions might be different in year two and you  
14 might get a different result, but. But if you  
15 establish it in year one, you may not need to go out  
16 in year two if you are trying to see if it actually  
17 happens.

18 Q. Could you please turn your attention to  
19 what's been marked as Icebreaker Exhibit 40. This  
20 was presented to you on recross.

21 A. Can you give me a title of the document,  
22 please?

23 Q. Yes. It is the Exhibit A. "On-Shore  
24 Bird and Bat Pre- and Post-Construction Monitoring  
25 Protocol for Commercial Wind Energy Facilities in

1 Ohio."

2 A. Exhibit A. I've got it.

3 Q. And just for the record, could you read  
4 the title of that document?

5 A. Sure. It's Exhibit A. It says "May 4th,  
6 2009. It says "On-Shore Bird and Bat Pre- and  
7 Post-Construction Monitoring Protocol for Commercial  
8 Wind Energy Facilities in Ohio." I'm sorry. I'm  
9 reading that so fast. I'll slow down.

10 ALJ ADDISON: Thank you.

11 Q. Is the facility being proposed in this  
12 proceeding an onshore project?

13 A. No, it's not. It's an offshore project.

14 MR. SIMMONS: Could I have just a minute,  
15 your Honor?

16 ALJ ADDISON: You may.

17 MR. SIMMONS: Nothing else, your Honor.

18 ALJ ADDISON: Thank you, Mr. Simmons.

19 - - -

20 EXAMINATION

21 By ALJ Addison:

22 Q. I had just a few questions, if you would  
23 indulge me, Mr. Mabee.

24 A. Absolutely.

25 Q. If you turn to Attachment TJM-2 to your



1 testimony. It's the Radar Monitoring Protocol.

2 A. Okay.

3 Q. I believe on redirect you had indicated  
4 that Accipiter had incorporated all of the suggested  
5 improvements made by Dr. Diehl in his report. Do you  
6 remember that?

7 A. Yes, I remember that.

8 Q. And just to be clear -- and if you  
9 wouldn't mind pulling out Icebreaker Exhibit No. 37,  
10 which is the Diehl Report. I'm sorry.

11 A. It's in the binder.

12 ALJ WALSTRA: QQ.

13 A. QQ, all right. I've got it.

14 Q. Starting on page 24 of that report --

15 A. Okay.

16 Q. -- and going through page 26, are those  
17 the recommendations that you -- that Accipiter,  
18 Incorporated, has referenced in the Radar Monitoring  
19 Protocol?

20 A. Can I read it briefly to confirm?

21 Q. You may.

22 A. Okay. Thank you. I'm ready to discuss  
23 those.

24 Q. Okay.

25 A. So the first -- bottom of page 24, the

1 last sentence says "Current RCS." That's radar  
2 cross-section. So here he's suggesting Accipiter  
3 uses radar cross-section-based target discrimination;  
4 and Diehl is saying, yes, and why don't you add  
5 airspeed too which -- which Accipiter agreed to do.  
6 So yes for the first one.

7 The second one, it says "Concerning  
8 tracking." That's that whole issue about he's said,  
9 you know, consider using a smaller-diameter antenna  
10 which gives you a bigger beam angle which gives you  
11 more ability to track in rough conditions. And I  
12 don't -- I think the -- you know, I hate to speak for  
13 the vendor. I think they want to stay with the  
14 4-degree beam because of the tradeoff, and the  
15 tradeoff is smaller beam, better ability to detect  
16 small objects at further distances, so it's a  
17 tradeoff. I think they are saying we would rather  
18 see out further, and we'll just elevate the beam  
19 more, so. So maybe not that one.

20 Q. Okay.

21 A. And then the next one -- oh, the next one  
22 is they are talking about side lobes and sea clutter  
23 and all that stuff and they're saying -- he's  
24 suggesting use a radar fence or a radar-absorbing  
25 material. Those are the mitigation options I

1 discussed and, yes, they are going to use those.

2 And then he talks about collecting  
3 concurrent data from the KCLA -- KCLE NEXRAD station,  
4 and they are going to do that. So that's -- that's  
5 my understanding of what the vendor would like to do  
6 as of now.

7 Q. Thank you very much.

8 A. Sure.

9 Q. And if you would please turn to page 25  
10 of the Diehl Report.

11 A. Okay.

12 Q. I believe on cross-examination you were  
13 asked if the Applicant had performed a barge  
14 pitch-and-roll test as referenced in the first full  
15 paragraph there.

16 A. I must be at a different paragraph than  
17 you. Page 25?

18 Q. Page 25.

19 MR. SECREST: Second bullet.

20 A. Oh, sorry. I don't know honestly if -- I  
21 don't know what the vendor -- I don't know if the  
22 vendor has a plan to do that. We didn't discuss  
23 that.

24 Q. Do you know if this type of test is  
25 typical for a similar project or an offshore wind

1 project?

2 A. I don't know to be honest. I know the  
3 vendor is going to test their radar. I would like to  
4 think that we'd put this on the test list.

5 Q. Thank you.

6 And then just very briefly, I know we  
7 talked about the advantages and disadvantages --  
8 disadvantages of vessel-based radar. Can you briefly  
9 describe any disadvantages there could be for a fixed  
10 platform?

11 A. I think the only thing that I mentioned  
12 was, you know, the thing about a fixed platform is  
13 it's fixed, right, so once you -- once it's mounted,  
14 it's there. And in a post-construction setting, the  
15 wind turbines are going to produce radar shadows and  
16 radar interference, and what that means is that there  
17 will be certain locations that will be difficult to  
18 sample for targets because of the structures  
19 themselves.

20 And the pre-construction data would give  
21 us some information as to the bird flight directions  
22 and bird flight paths and, based on that, you could  
23 move the VBR to a location to optimize the location  
24 to detect the targets while minimizing that problem.  
25 And you're not going to know -- I guess the point is

1     you are not going to know the perfect location --  
2     pre-construction it doesn't matter, you just put the  
3     radar in the middle of the site, there's nothing  
4     there. No problem. But post-construction, you've  
5     got the turbines and then you really need to know or  
6     it's helpful to know where the birds are flying  
7     relative to those turbines to be able to look for  
8     these behavioral avoidance patterns.

9                 So, a long answer to say that there is an  
10    advantage to being able to move that radar into a  
11    different position. A fixed platform wouldn't allow  
12    you to do that. You would just go back and sample,  
13    you know.

14                Q.    Thank you.

15                Just to reiterate, one of the  
16    disadvantages, I think we have extensively covered  
17    today, of VBR, would be the motion caused by the  
18    vessel itself, correct?

19                A.    Correct, yes.

20                Q.    But you did describe the fact that there  
21    might be mitigation measures that could be  
22    implemented to at least reduce the amount of motion  
23    that's covered by the radar.

24                A.    Yes, yes.

25                Q.    Or -- yeah. For those mitigation

1 measures to be effective in mitigating that  
2 additional uncertainty in the study, would there be  
3 any sort of adjustment period that -- in which you  
4 would have to calibrate those measures in order to  
5 make sure that they are providing you the most  
6 reliable results?

7 A. I don't know exactly. I don't know  
8 exactly how -- it depends on what they use as to --  
9 to answer the question.

10 Q. Sure.

11 A. So I don't know exactly.

12 Q. So even if I broke it up and used, I  
13 think you referenced gimbals or accelerometer; is  
14 that correct?

15 A. Right.

16 Q. So even if I broke it up into those two  
17 specific examples, you wouldn't be able to tell me  
18 for sure what -- what amount of time would be  
19 necessary in order to calibrate those?

20 A. No. I would defer to Accipiter to make  
21 that statement.

22 ALJ ADDISON: Okay. Thank you. Those  
23 are all my questions. You're excused, Mr. Mabee.  
24 Thank you so much.

25 THE WITNESS: Thank you.

1 ALJ ADDISON: Mr. Secrest.

2 MR. SECREST: Your Honor, may Applicant  
3 call Wallace Erickson.

4 ALJ ADDISON: Well, I believe we have --

5 MR. SECREST: I'm sorry. Move to admit  
6 exhibits.

7 ALJ ADDISON: Yes, thank you. Sorry,  
8 Mr. Erickson. We will get to you here shortly.

9 MR. SECREST: Thank you, your Honor. I  
10 believe we only had 32, which was Mr. Mabee's  
11 testimony -- I believe we only had 32, which was  
12 Mr. Mabee's testimony, and 40 which was the "On-Shore  
13 Bird and Bat Pre- and Post-Construction Monitoring  
14 Protocol for Commercial Wind Energy Facilities in  
15 Ohio."

16 ALJ ADDISON: Thank you. Are there any  
17 objections to the admission of Applicant's Exhibits  
18 No. 32 and 40?

19 MR. STOCK: No.

20 MR. SIMMONS: No, your Honor.

21 ALJ ADDISON: If there are no objections,  
22 those exhibits will be admitted.

23 (EXHIBITS ADMITTED INTO EVIDENCE.)

24 ALJ ADDISON: Mr. Stock.

25 MR. STOCK: I believe cross-referencing

1 the various sources of identification for exhibits  
2 that the only new exhibit number we have was -- or is  
3 the Mount Storm study which is Exhibit 17. Does that  
4 seem to comport with everybody else's scorecard?

5 ALJ ADDISON: I know you had marked  
6 Mr. Mabee's résumé as a separate exhibit, but it is  
7 also attached to his --

8 MR. STOCK: TJM-1.

9 ALJ ADDISON: Right. Will you also be  
10 moving Exhibit 18?

11 MR. STOCK: Sure. Thank you.

12 ALJ ADDISON: Are there any objections to  
13 Residents Exhibits No. 17 and 18?

14 MR. SECREST: No, your Honor.

15 MR. SIMMONS: No, your Honor.

16 ALJ ADDISON: Hearing none, those will be  
17 admitted.

18 (EXHIBITS ADMITTED INTO EVIDENCE.)

19 MR. STOCK: Thank you.

20 ALJ ADDISON: And we will take a brief  
21 break to allow everyone to prepare for the next  
22 witness. So let's come back in about 5 minutes.  
23 Thank you.

24 (Recess taken.)

25 ALJ WALSTRA: We are officially back on



1 the record. If you would like to call your next  
2 witness, Mr. Secrest.

3 MR. SECREST: Yes, thank you, your Honor.  
4 May Applicant call Wallace Erickson.

5 (Witness sworn.)

6 ALJ WALSTRA: Please take a seat.

7 MR. SECREST: And may I approach the  
8 witness, your Honor?

9 ALJ WALSTRA: You may.

10 - - -

11 WALLACE P. ERICKSON

12 being first duly sworn, as prescribed by law, was  
13 examined and testified as follows:

14 DIRECT EXAMINATION

15 By Mr. Secrest:

16 Q. Mr. Erickson, will you please state your  
17 full name.

18 A. Wallace Paul Erickson.

19 MR. SECREST: And, your Honor, I have  
20 handed Mr. Erickson what's been marked as Applicant's  
21 33, or may I so move to mark what I have handed  
22 Mr. Erickson which is his prefiled testimony as  
23 Exhibit 33?

24 ALJ WALSTRA: So marked.

25 (EXHIBIT MARKED FOR IDENTIFICATION.)

1 MR. SECREST: Thank you.

2 Q. (By Mr. Secrest) Mr. Erickson, are there  
3 corrections to your prefiled testimony that are  
4 necessary?

5 A. There are.

6 Q. All right. Please refer to page 12.  
7 Please tell us what corrections are necessary to page  
8 12.

9 A. So on the Table 1, the line it says  
10 "Genessee County." The No. "555" should be "818."

11 MR. STOCK: Sorry, is this in the  
12 testimony?

13 Q. Page 13.

14 A. I'm on page 13.

15 Q. Okay.

16 A. Okay. I went too far.

17 Q. I didn't go far enough.

18 A. I apologize, guys.

19 All right. So on page 13, in the table,  
20 Genessee County, it should be "818" under targets per  
21 kilometer per hour. It was "555."

22 And there was two changes on the  
23 altitudes. One for Wayne County, which is supposed  
24 to be "600" and the second one would be "684." And  
25 then that did change the averages to "485" and "599"

1 on the bottom, the average for those two columns. Is  
2 that clear?

3 MR. STOCK: Could you say that again, on  
4 the bottom, the total?

5 THE WITNESS: Yeah. The average would be  
6 "485" for targets per kilometer per hour, and "599."

7 MR. STOCK: "599" on mean altitude.

8 THE WITNESS: Yeah. All right.

9 MR. STOCK: Thank you.

10 Q. Mr. Erickson, did you have a correction  
11 to a citation on page 12, specifically line 20?

12 A. Yes. That should be a reference to  
13 Attachment 6 on line 20.

14 Q. So instead of Attachment 5, that should  
15 be 6?

16 A. Correct.

17 Q. Thank you.

18 And we have added two attachments to your  
19 testimony that were inadvertently omitted from the  
20 originals, Attachment WE-7 and WE-8. Do you have  
21 those attachments?

22 A. I do.

23 MR. STOCK: Which is which, please?

24 MR. SECREST: WE-7, top right-hand  
25 corner.

1 MR. STOCK: Thank you.

2 MR. SECREST: Sure.

3 Q. (By Mr. Secrest) Any other corrections  
4 necessary to your testimony, Mr. Erickson?

5 A. Actually, yes.

6 Q. What might that be?

7 A. Page 7.

8 Q. What is the change?

9 A. Lines 15, 16, and 17 should be struck.

10 Q. Anything else, Mr. Erickson?

11 A. No.

12 MR. SECREST: Thank you.

13 I tender Mr. Erickson. Thank you, your  
14 Honor.

15 ALJ WALSTRA: Thank you.

16 Ms. Leppla?

17 MS. LEPPLA: No, your Honor.

18 ALJ WALSTRA: Mr. Stock?

19 MR. STOCK: Thank you.

20 - - -

21 CROSS-EXAMINATION

22 By Mr. Stock:

23 Q. Good afternoon, Mr. Erickson.

24 A. Good afternoon, Mr. Stock.

25 Q. We've not met.

1           A.    I don't believe so.

2           Q.    You've heard me blather on for days now,  
3 but I have not had a chance to talk to you. Nice to  
4 meet you. Explain to me that last change to your  
5 testimony the striking of lines 5, 16, and 17 on  
6 page 7.

7           A.    Yeah. When I was reviewing a lot of the  
8 Service reports on the -- on their website related to  
9 their radar efforts in Great Lakes region, there's a  
10 draft report out on the web, and that's just -- it's  
11 the 2017, I believe, report, and that was an  
12 incomplete draft that hadn't been -- there wasn't any  
13 acknowledgment of peer review and -- but the 2012  
14 report, which is my Attachment 7, it's the spring  
15 2012, I missed the -- I missed in that the  
16 acknowledgments that said there was external peer  
17 review.

18          Q.    Okay. So there has been external peer  
19 review of your Exhibit 7?

20          A.    Based on the acknowledgment section,  
21 yeah, where it references that.

22          Q.    Okay. Thank you.

23                Now, what does that mean that this  
24 Exhibit 7 has been peer reviewed?

25          A.    I don't really know other than they -- it

1 sounds like they provided it to folks probably  
2 outside their group, maybe outside the Service, to  
3 get external review of that report.

4 Q. Okay. Do you know, is your understanding  
5 of peer review that it is a process by which a  
6 generally scientific publication is circulated within  
7 the scientific community relating to that specialty  
8 area, if you will, for review by those who have  
9 knowledge in that field?

10 A. In this -- for this particular report, I  
11 don't know what they did for the external peer  
12 review.

13 Q. Okay.

14 A. You know, this is a technical report.

15 Q. Right.

16 A. So I don't know. If you are submitting  
17 it to a journal, for example, then you -- then it's a  
18 little bit more defined in terms of what peer review  
19 is. This is not -- I don't believe this particular  
20 report, for example, has been submitted to a peer  
21 review journal.

22 Q. How would you know that?

23 A. I guess I'm not aware that it has.

24 Q. Okay. Thank you.

25 I guess the best place to start is at the

1 beginning. What is a biometrician?

2 A. A biometrician is basically a  
3 statistician, training in statistics, that has really  
4 focused on wildlife, natural resources, those sort of  
5 applications.

6 Q. And excuse me. I've looked at your  
7 résumé, but I have looked at an awful lot of paper  
8 recently. You've been working professionally in this  
9 field for how long?

10 A. I've been working at WEST most of my  
11 career and that began in 1991, after I finished my  
12 work with -- finished my Master's at Wyoming.

13 Q. Okay. As a biometrician, have you  
14 personally designed and implemented pre-construction  
15 avian radar studies for wind turbine projects?

16 A. I have.

17 Q. Okay. So that is part of what you do.

18 A. WEST has several marine radars, and we  
19 have done pre-construction radar studies.

20 Q. You're saying "we" collectively. That  
21 includes you?

22 A. It does.

23 Q. Okay. Now, I almost hesitate to ask, but  
24 the Joint Stipulation has to be up there somewhere.  
25 Unfortunately -- well, I have not given you a binder

1 of exhibits yet. Let me go ahead and do that. It is  
2 not in there, so we are still going to have to find  
3 it, the Stipulation.

4 MR. SECREST: Victor Victor.

5 MR. STOCK: Victor Victor in the last  
6 one?

7 MR. SECREST: Right.

8 MR. STOCK: If I may approach?

9 ALJ WALSTRA: You may.

10 Q. (By Mr. Stock) Do you have Tab VV from --

11 A. The other binder.

12 Q. -- Todd Mabee's binder?

13 A. Yes, I do.

14 Q. Thank you. Have you read the Stipulation  
15 before?

16 A. I have.

17 Q. Okay. Have you read the Staff Report?

18 A. I have read parts of it.

19 Q. Okay. Specifically, if you would take a  
20 look at page 7, Condition 22(d) in the Stipulation.  
21 It reads: "Radar must be able to determine flight  
22 altitude of migrants at altitudes near and entirely  
23 within the rotor-swept zone at the project site to  
24 quantify collision risk." Do you see that?

25 A. I do.



1           Q.    Is it not true that NEXRAD radar emitted  
2   from the KCLE -- KCLE radar unit located on land near  
3   Cleveland, approximately 14 miles from the project  
4   site, cannot determine the flight altitude of  
5   migrants at altitudes entirely within the rotor-swept  
6   zone?

7           A.    The NEXRAD data -- and I want to just  
8   qualify, early, that my role in support of the  
9   stipulations is based on the low risk of the project.

10          Q.    Okay.

11          A.    Okay? But the NEXRAD site at KCLE can  
12   determine flight altitudes of migrants within the --  
13   within part of the rotor-swept zone --

14          Q.    And we've been through that.

15          A.    -- at the project, correct.

16          Q.    We've been through the extent of cross, I  
17   am not going through that, but not entirely within  
18   the rotor-swept zone, correct?

19          A.    Correct.

20          Q.    Okay. Now, if I can find it in my papers  
21   here, your testimony. Let's go to Question 12 and  
22   your answer.

23          A.    And what page is that?

24          Q.    That was page 6 at the top, Question 12.

25          A.    Gotcha. In the middle there, line 18,

1     yeah.

2             Q.     Yeah, line 18, Question 12.    "What makes  
3     you think nocturnal migrant birds behave the same  
4     over land as over water?"

5             And your answer is "Empirical data from  
6     two studies have estimated lower nighttime migration  
7     intensity over water than land in the Great Lakes  
8     Region (Attachment WE-3...."   And WE-3 is Robb  
9     Diehl's 2003 article, correct?

10            A.     Correct.

11            Q.     All right.   And the "2017 NEXRAD  
12     Analysis" done by WEST, correct?

13            A.     Correct.

14            Q.     It then reads: "In addition, a recent  
15     study, (Attachment WE-4)" --

16            A.     Is the Archibald study.

17            Q.     That is the, what is that, the 2017  
18     Archibald study?

19            A.     Correct.

20            Q.     And Archibald, that is NEXRAD-radar-based  
21     too, correct?

22            A.     Correct.

23            Q.     Okay.   "...analyzed and presented data  
24     from the KCLE weather radar and this information  
25     suggested higher mean altitudes of birds over water

1     than land in Lake Erie." Do you see that?

2             A.     Yep.

3             Q.     Okay. I now want you to go to Tab XX of  
4     your binder, your binder, which is the Diehl Report.

5             ALJ WALSTRA: Which is Icebreaker 37.

6             MR. STOCK: Yes. Thank you.

7             Q.     Are you there?

8             A.     I am.

9             Q.     That is the same Robert Diehl who wrote  
10    the article that you referred to in your testimony as  
11    Attachment WE-3, correct?

12            A.     Yeah, Dr. Robert Diehl.

13            Q.     Okay. Let's turn to page 9.

14            A.     Page 9 of?

15            Q.     Of the Diehl Report. Actually, let's  
16    start at the bottom of page 8. I want to make sure  
17    we have full context here. Starting down at the  
18    bottom, the last full paragraph, "Comparing data  
19    collection during calm and rough sea days would allow  
20    assessment of whether data was compromised during  
21    poor weather conditions in an effort to inform future  
22    sampling efforts. The primary cause of compromised  
23    data would likely be the inability to acquire or  
24    maintain tracks through successive sweeps of the  
25    radar either owing to sea clutter or barge movement.

1 Clutter from the sea and other sources can cause  
2 tracking algorithms to produce false tracks that are  
3 spurious. Motion of the barge may also cause a  
4 target to be dropped and reacquired which may be  
5 interpreted as a separate track depending on the  
6 sophistication of the tracking software. If present,  
7 both of these factors can artificially inflate  
8 estimates of traffic rate. The magnitude of these  
9 errors would be expected to vary with conditions in  
10 the manner in which data were collected."

11 The next paragraph: "To help determine  
12 the meaningfulness of such loss, it may be useful to  
13 supplement offshore radar data collection," and the  
14 offshore radar data collection that is being referred  
15 to includes the radar that is referred to in the  
16 Stipulation in Condition 22(d), right?

17 A. I don't know. You're going a little too  
18 fast here.

19 Q. Okay. We'll slow down.

20 A. All right. Could you repeat the  
21 question?

22 Q. Yes. The sentence reads: "To help  
23 determine the meaningfulness of such loss," that is,  
24 potential loss of data as referenced in the prior  
25 paragraph, "it may be useful to supplement offshore

1 radar data collection," and the offshore radar data  
2 collection is the data collection that is addressed  
3 in Condition 22 including subparagraph (d), right?

4 A. I'm not positive, but I believe so.

5 Q. Okay. "Radar must be able to determine  
6 flight altitude of migrants at altitudes near or  
7 entirely within the rotor-swept zone at the project  
8 site to quantify collision risk." That's part of the  
9 radar capabilities that are supposed to be present  
10 for the pre-construction radar study that's going to  
11 be done by LEEDCo, correct, or by Icebreaker?

12 A. Could you repeat that last part?

13 Q. Yeah. This condition, subparagraph (d),  
14 "Radar must be able to determine flight altitudes of  
15 migrants at altitudes near or entirely within the  
16 rotor-swept zone at the project site to quantify  
17 collision risk." That is an attribute of, or  
18 condition for, the pre-construction radar study that  
19 Icebreaker is supposed to perform in connection with  
20 this project; can we agree on that?

21 A. Well -- well, I think we can agree, but  
22 you've referenced me to this binder and this binder  
23 with the Joint Stipulation, so I want to just look at  
24 the Stipulation.

25 Q. Go ahead.

1           A.    Okay?  And, again, remind me, is that VV,  
2   right?

3           Q.    Yes.  And they are in separate binders,  
4   so you can keep them both open next to each other.

5           A.    Yes.  Thanks.  Appreciate that.

6           Q.    I want you to understand what I'm saying,  
7   you know.

8           A.    Thanks.  Okay.  So as far as the  
9   Stipulation goes, I -- I have read those, but I -- I  
10   don't -- and I also -- I am not -- have not been  
11   involved in the development of the -- of the radar  
12   study vendor evaluation.

13          Q.    Okay.

14          A.    So -- but so repeat your question one  
15   more time.  I'll answer it.  I'm just qualifying that  
16   I haven't been involved in that piece.

17          Q.    Okay.  You've read the Stipulation,  
18   correct?

19          A.    Correct.

20          Q.    Have you read the Diehl Report?

21          A.    The Diehl Report, if I have, it hasn't  
22   been a focus because my focus of my testimony has  
23   been on the risk assessment.

24          Q.    Are you saying you have not read it?

25          A.    I haven't -- I don't think I've read it

1 completely.

2 Q. Okay.

3 A. But let's go and -- let's go, we'll go  
4 back to your question and I'll answer your question.

5 Q. Okay. So let's go back to the paragraph  
6 on page 9. First full paragraph. "To help determine  
7 the meaningfulness of such loss," and you understand  
8 the Diehl Report relates to the evaluation of vendor  
9 proposals to perform the pre-construction radar study  
10 for this project, right?

11 A. I do. And so which section -- that is in  
12 section -- I am just trying to get the gist of the  
13 whole report. I want to see what section I'm in. So  
14 "Data impacts."

15 Q. And if --

16 A. I am just going back to see the context  
17 of this section. Okay?

18 Q. Do whatever you are comfortable with.

19 A. Thank you. So it looks like in this  
20 section he is addressing potential data impacts.

21 Q. Possible loss of data due to field  
22 conditions, right?

23 A. All right. I think I'm ready, so ask the  
24 questions.

25 Q. You're fine. You're fine.

1                   So first full paragraph: "To help  
2 determine the meaningfulness of such loss," and you  
3 understand that to relate to the data, potential data  
4 loss events listed above?

5           A.    The different losses, it sounds like.

6           Q.    Yeah.  Okay.

7           A.    Okay.

8           Q.    "....it may be useful to supplement  
9 offshore radar data collection," and you understand  
10 the "offshore radar data collection" to be a  
11 reference to whatever the ultimate solution is out at  
12 the project site collecting data, correct?

13          A.    Correct.

14          Q.    "...it might be useful to supplement  
15 offshore radar data collection with analysis of  
16 contemporaneous data from the fortuitously close  
17 Cleveland, Ohio, NEXRAD station (KCLE)."

18          A.    Okay.

19          Q.    Do you understand that so far?

20          A.    I do.

21          Q.    Okay.  "Advances in NEXRAD quantification  
22 enabled estimates of vertebrate density (Chilson et  
23 al. 2012) that could be used to verify migration  
24 traffic rate or density estimates determined by  
25 portable radar."



1 A. Yes. So what is your question?

2 Q. Well, I'm not there.

3 A. Okay.

4 Q. I am laying context.

5 A. All right. You're laying a lot of  
6 context, but good.

7 Q. You want time to read. Give me time to  
8 ask my question.

9 A. Sounds good.

10 Q. We'll work both ways. All right. It  
11 then says "This form of corroboration," that is,  
12 using KCLE NEXRAD radar, all right, "would help  
13 ensure any data drops did not correspond with  
14 particularly large migratory movements during the  
15 study, recognizing that this approach is imperfect  
16 given the complexity of movements that may occur in  
17 the vicinity of coasts," and he cites the Archibald  
18 article, right?

19 A. That's, yes, that's what he --

20 Q. That's your Archibald article.

21 A. No, it's Archibald's.

22 Q. Right. Well, it's your as an exhibit.

23 A. Gotcha.

24 Q. Right?

25 A. Yep.

1 Q. In support of your testimony, right?

2 A. It is an exhibit in my testimony.

3 Q. Okay. And then he cites his own Diehl  
4 article, correct?

5 A. He does.

6 Q. That's also one of the exhibits in  
7 support of your testimony, right?

8 A. Yeah. It was also part of original risk  
9 assessment.

10 Q. Okay. That's fine. "...and that KCLE  
11 has an imperfect view of low altitude movements." So  
12 he says this is an imperfect approach for covering --  
13 obtaining data at the project site in replacement for  
14 or when the portable unit is not working, given the  
15 complexity of movements that may occur in the  
16 vicinity of the coastline, as evidenced by or  
17 supported by the Archibald article and his article,  
18 in that KCLE has an imperfect view of low altitude  
19 movements, and he cites Nation and Gordon 2017, and  
20 that's the WEST January 23, 2017, NEXRAD study  
21 rights?

22 A. It is.

23 Q. Okay. Thank you.

24 A. All right. So what's the question?

25 Q. The question is: Do you disagree with

1 his analysis that the approach is imperfect, that is,  
2 to use KCLE NEXRAD data to cover for the portable  
3 unit that's out at the project site when that radar,  
4 portable radar out at the project site is not in  
5 operation, collecting usable data?

6 A. Well, I don't know, you know, what does  
7 "imperfect" mean. It Robb's -- Robb Diehl,  
8 Dr. Diehl's term he used. You know, pretty much  
9 all -- I would say all radar data collection has  
10 imperfections. You know, for example, you're trying  
11 to measure birds and you know that you're getting  
12 birds and bats, sometimes insects. Radar data, in  
13 general, is imperfect.

14 In this case, you're trying -- you're  
15 basically -- here is what you would be doing in the  
16 analysis, okay? Let's say you're in a season,  
17 collecting data, using the offshore radar. Whatever  
18 one ends up getting chosen.

19 Q. Right, right, right.

20 A. And NEXRAD is a really good tool for  
21 looking at the intensity of migration happening on  
22 that night. You can look at a lot of different  
23 areas. In this case, I think I like the term, which  
24 I hadn't read before, the "fortuitously," what was  
25 it -- read it here. Where he said that KCLE is

1 fortuitously close. So I think I'm assuming that  
2 means a pretty optimal area for this.

3 And so, let's say we miss a night. Let's  
4 say we miss a few nights during the season. You're  
5 going to look at NEXRAD and look at that whole  
6 migration period and say what was migration happening  
7 on those nights that you weren't able to collect  
8 data? And let's say it was, you know, that's a lot  
9 of data. We are dealing with a lot of data during  
10 that period.

11 Let's say it was three low nights and one  
12 pulse night from NEXRAD. That would be a pretty good  
13 way to say, you know, what happened during those  
14 nights where we didn't have data. Well, we had four  
15 nights that weren't so good and -- in terms of  
16 migration, based on NEXRAD, and one night that was.

17 And so, I think you could use that, for  
18 example, to try to correct and say, geez, did we miss  
19 a big pulse or not. In this case, I think I said  
20 there was four -- five nights missed, over the course  
21 of a long season, and so you could use that to  
22 adjust.

23 Q. All right. Let's assume there was a big  
24 pulse picked up by the NEXRAD radar out over the  
25 project site, okay? Assume that.

1           A.    Which night?

2           Q.    Pick a night.

3           A.    Okay.  I got you.

4           Q.    Any night, I don't care what night.

5           A.    One that you had data from the --

6           Q.    No, no.

7           A.    -- offshore?

8           Q.    No.  One when you don't have data from  
9 the offshore.

10          A.    Gotcha.

11          Q.    All right.  And there's a pulse on some  
12 night and it shows there is a big pulse out over the  
13 project area.  All right?  Are you with me?

14          A.    Yeah.  Yep.

15          Q.    That NEXRAD radar data will not tell you  
16 whether or not there were birds flying from 20 meters  
17 above the water to 114 meters above the water,  
18 correct?

19          A.    Well, I would say that there's a little  
20 imperfection, right, in that angle, so we said it's  
21 about 114.  If they're right over the project and  
22 there's no bend in the angle at all, the -- I need  
23 you to repeat the question because I'm talking too  
24 much here, and I forgot what the question was.

25          Q.    Big pulse of birds, NEXRAD radar is all

1 we've got. The portable unit's out. The big pulse  
2 of birds some night over the project area. That  
3 NEXRAD radar data will not give you any data  
4 regarding whether or not there are birds in the  
5 project area from 20 meters above the water to -- and  
6 we can be conservative -- 110 meters above the water.

7 A. At that location, no, but you could  
8 get --

9 Q. Okay.

10 A. You could get information at lower  
11 altitudes, bring it back a little bit, look a mile or  
12 2 or 3 away from the project here to say, you know,  
13 what was happening at that night there, which isn't  
14 right at the project, but it is probably relative for  
15 what we're talking about here because we're  
16 getting -- with radar you are getting, you know,  
17 biological targets. You're getting bats, birds,  
18 insects. There's imperfections in it. I think that  
19 would be useful information that might help you  
20 define -- determine whether you think that night the  
21 migrants were just where you said, 114 or above, or  
22 there were migrants lower.

23 Q. But at the project site there is no  
24 aspect of that radar beam that is crossing the  
25 project area at 20 meters.

1           A.    The NEXRAD beam.

2           Q.    Yep.

3           A.    No.

4           Q.    All right.  And not at 50 meters.

5           A.    Based on theoretic beam, no.

6           Q.    Okay.  And you don't have any information  
7 to dispute that, do you?

8           A.    I don't other than I know radar beams,  
9 the literature says radar beams band so, you know,  
10 you're saying that -- that particular location but,  
11 you know, we know there's some imperfections in the  
12 edges of the beams.

13          Q.    Okay.  The NEXRAD report gave it 114 to  
14 126.  Do you think they are not right?

15          A.    Not -- "114 to 126," I don't know what  
16 that means.

17          Q.    That means at the -- well, have you  
18 reviewed the NEXRAD radar report?

19          A.    I have, I have, but you said 114 -- I  
20 didn't know what "114 to 126" meant.

21          Q.    The lowest elevation of the NEXRAD radar  
22 beam going over the project area.

23          A.    So that's the lower, 114.

24          Q.    Yeah.

25          A.    Correct.

1 Q. If it said that, isn't that correct?

2 A. If it said that, isn't it correct? Well,  
3 with radar and beams, theoretic beam, okay, so it is  
4 approximately correct.

5 Q. Okay.

6 A. Okay. Approximately correct, but we know  
7 that there's error in that.

8 Q. Okay.

9 MR. STOCK: Excuse me while I check my  
10 notes.

11 Q. If you would turn your attention to your  
12 testimony on page 4, Question 11.

13 A. I'm there. Thank you.

14 Q. All right. It asked: "Why do you believe  
15 that collision mortality statistics from onshore wind  
16 farms are relevant and can be used to predict  
17 mortality at offshore wind farms?" And you  
18 answered -- well, before I ask that, what is your  
19 experience conducting mortality studies at offshore  
20 wind farms?

21 A. My experience is limited to hundreds of  
22 studies onshore in a lot of different environments.  
23 So no experience on an offshore project for -- I  
24 missed the question. Did you say carcass searching  
25 or did you say --



1           Q.    What I asked is what is your experience  
2 with mortality studies relating to offshore wind  
3 farms?

4           A.    So I'm -- I do not have any experience  
5 with that.

6           Q.    Okay. Thank you.

7           A.    I want to qualify that. I have been  
8 involved in reviewing literature and looking at  
9 techniques and technologies regarding offshore wind  
10 farms and mortality monitoring. Basically I'm one of  
11 the PIs on the -- on our team that's working with  
12 several vendors to -- and the DOE, recent DOE grant,  
13 to submit for funding to test several different  
14 technologies.

15          Q.    As we sit here today, have you personally  
16 conducted any sort of mortality study, fatality study  
17 with respect to an offshore wind farm?

18          A.    At an existing facility that's been  
19 built?

20          Q.    Yes.

21          A.    No.

22          Q.    All right. Let's talk about an offshore  
23 facility that has not been built. Have you conducted  
24 a study -- a fatality study for an offshore wind farm  
25 that is yet to be built?

1           A.    I have not conducted a study.  I've  
2    reviewed a lot of the potential options for  
3    understanding the fatality after a project is built.

4           Q.    That is, what sort of technology might be  
5    used to detect collisions and/or fatalities at an  
6    offshore facility?

7           A.    Yeah, offshore, and actually some of the  
8    technologies are being looked at onshore, camera  
9    systems, so I have experience on the technologies on  
10   turbines.  That turbine wasn't sitting offshore.  It  
11   was sitting at NREL, so that's my experience.  It's  
12   at a turbine but it's not in an offshore environment,  
13   and it's technologies like the ones we are talking  
14   about for Icebreaker.

15          Q.    Are you aware of any validation studies  
16   that have been performed with respect to the  
17   technologies under consideration for determining  
18   collisions or fatalities at this project?

19          A.    Could you repeat the question?

20               MR. STOCK:  Could you read that back,  
21   please.

22               ALJ WALSTRA:  Thank you, Karen.

23               (Record read.)

24          A.    You know, that's a tough question.  
25   Some -- you know, we are looking at a multi-sensor

1 approach. So I think you heard earlier, Rhett  
2 talking about vibration sensors in the blades. So  
3 I've seen some study of -- of detections of that  
4 system, collision detections of that system. Test --  
5 again, I believe it was in the Netherlands. I also  
6 have been working a lot with thermal cameras and  
7 visual cameras. I've been down to the National Wind  
8 Technology Center. There's some research going on  
9 right now that's looking at thermal cameras pointed  
10 at the turbine to look at bat behavior, bird  
11 behavior, and collision.

12 And so, you know, as far as the  
13 individual sensors breaking it apart, I have, yes,  
14 I've seen those technologies. I worked with some of  
15 those technologies and I've seen them detect  
16 collisions. What we are going to be looking at is a  
17 multi-sensor approach to basically take that and be  
18 able to quantify the mortality rate.

19 Q. And what do the validation studies show?

20 A. That you can detect collisions with these  
21 systems. There are other factors like you end up  
22 with some false positives. But they've been able to  
23 detect collisions, you know. I've seen videos of  
24 bats coming in and colliding with the turbine. And  
25 falling to the ground. I assume it's dead. But

1     that's what the video shows. In that case, the  
2     camera system.

3             And I also know that with the vibration  
4     sensors there's been, you know, reports, I have a  
5     report from WTBird that demonstrated a collision with  
6     their -- you know, we've heard thunk detector, it's  
7     picking up vibrations in the blade. And they also  
8     had a few false positives with other things, you  
9     know, said detection camera looked, it wasn't -- it  
10    wasn't -- it looked like it wasn't a bird, I think in  
11    one case it was ice. So, yes, that's my experience  
12    with the technology.

13            Q.    You read about these?

14            A.    I have seen presentations, read them,  
15    the -- I have seen videos and I've been down to NWTC  
16    and talked to the researcher who is doing that work.  
17    So have I -- well, actually even that researcher  
18    hasn't because it's automated, right? The camera  
19    system collects data. So I saw the data that he  
20    looked at to show a collision.

21            Q.    And what you're telling us is you saw  
22    that the system identified a bird hitting a turbine  
23    blade; is that correct?

24            A.    So in the case of the camera system --

25            Q.    Right.

1           A.    -- what I've seen is a bat collision.

2           Q.    Okay.

3           A.    And actually multiple.  There has been  
4 several researchers doing this work on, you know,  
5 there is a lot of focus on, you know, the behavior of  
6 bats around turbines.  So there's been a lot of study  
7 on thermal cameras.  And other sensors, acoustics and  
8 thermal combined.  I think you're going to need  
9 multiple sensors to detect collisions as well as  
10 behavior.

11          Q.    And what validation studies have been  
12 done with respect to those technologies to compare  
13 the detection by either thermal or video and  
14 verification of fatalities through carcass study?

15          A.    Well, there is one that has been done at  
16 I believe the Fowler project so they did actually --  
17 I believe they did radar as well as camera systems to  
18 detect car -- to see collisions and then they also  
19 did fatality searches.  They also had one of the  
20 radars that's being considered here at that site, and  
21 so they've collected information on that as well.  
22 The challenge is with birds at that site and most  
23 sites, it's a rare event.  The mortality has been a  
24 rare event.  So getting many carcasses under the  
25 turbine in terms of actual collisions, for birds,

1 it's been more difficult.

2 For bats it has been easier because  
3 fatality rates, at least at this site, it was higher.

4 Q. And Fowler was bats, was it not?

5 A. They were focused on bats but.

6 Q. Right.

7 A. They were focused on bats in that case.

8 Q. Now, for birds, what technology is under  
9 consideration for this project?

10 A. Oh, both -- both thermal and -- both  
11 cameras and potentially -- and, again, that hasn't  
12 been decided yet, but the promising technologies, and  
13 we are on two of the DOE submittals, and there's  
14 several, and the DOE put out a million-dollar  
15 potential award for offshore collision detection, and  
16 we're on at least two, and there's another one that's  
17 being submitted and I believe Dr. Good mentioned a  
18 few of those, but the ones I'm most familiar with is  
19 WTBird and thermal cameras and, you know, that's  
20 pretty -- and their system is both a detection system  
21 as well as a camera system.

22 And Dr. -- Paul Cryan's work was focused  
23 on cameras and radars, and I think they had acoustics  
24 as well so, at Fowler, and he also -- he's doing work  
25 at, where I saw him and his camera system down at the

1 National Wind Technology Center, it's just down the  
2 road from where I live, and it is using a camera  
3 system, and then he's testing a deterrent, a UV  
4 deterrent for bats.

5 Q. What validation studies have been used  
6 for WTBird in an offshore environment?

7 A. One is they catapult different-sized  
8 sandbags to simulate different-sized birds, to  
9 determine if the vibration sensor in the blades can  
10 pick up the thunk. That's where thunk comes from.  
11 And so, the validation has been focused right now on  
12 the sense -- getting the sensitivity -- in the past  
13 they've done that, and they've also documented bird  
14 collision, at least one bird collision with the  
15 system.

16 But as far as validation, that's one of  
17 the first steps to validation will be to throw things  
18 at the blade of different sizes and weights and  
19 determine the sensitivity. They are also -- you  
20 know, again this is part of our proposal.

21 Q. Right.

22 A. Also be looking at how many sensors do  
23 you need to pick up smaller detections. And cameras  
24 are going to be a piece of it, either way.

25 Q. Right. But let's talk, there are

1 operating offshore wind-turbine farms, projects, in  
2 Europe, right?

3 A. Absolutely.

4 Q. All right.

5 A. That's where WTBird is from. That's  
6 where they are testing it.

7 Q. All right. Have you presented to the  
8 Power Siting Board, in your materials here, any  
9 validation studies showing that these technologies  
10 accurately determine fatalities of birds at offshore  
11 wind turbines?

12 A. Not in my testimony. I don't recall if  
13 anything was put in Rhett's, he's in charge,  
14 primarily in charge of the monitoring plan but, so I  
15 don't believe so, but I'm just telling you that there  
16 are, I guess, you know, there are documentation of  
17 these technologies being able to document collisions.  
18 It's all about -- after that, it's all about the  
19 probability of detection. Okay? What is the  
20 probability of detection? Like in a carcass search.  
21 When we do carcass searches, we've got to determine  
22 what the detection probability is of the carcasses.  
23 So we go out there -- and I'll just give you the  
24 analogy of what we're going to have to do here and  
25 what we are trying to do and what we have to do in



1 carcass studies.

2 Q. Right.

3 A. So you might go out there on a turbine  
4 and search, let's say it's every week, okay, a sample  
5 of turbines in a wind project -- you don't sample  
6 them all, typically -- and you look for things  
7 underneath the turbine. You look for carcasses. And  
8 then you do other experimental trials. Searcher  
9 efficiency trials. So are the people you have  
10 walking around there very good at picking up  
11 carcasses. So you do blind trials to try to estimate  
12 how likely they are to pick up a carcass, find a  
13 carcass. So you estimate the searcher efficiency;  
14 probability of detection by the observers.

15 The other thing you do, which I'm kind of  
16 excited about, what we are looking at for technology  
17 here is you don't go out there ever day. You go out  
18 there at a periodic time and check. Something might  
19 have been hit by a turbine and landed two days after  
20 you last searched, you go out there on day seven, it  
21 might have been removed by a scavenger. So you  
22 actually have to estimate how many birds are removed  
23 by scavengers. So that's called the carcass  
24 persistence rate. It's another correction. So you  
25 take what you find and adjust for these things that

1 you've missed and those are the two -- two of the  
2 components.

3 And another challenge is when you got out  
4 there and can't actually see the collision in the  
5 blade, you just assume that it was a collision.

6 okay? So, I don't know, I have 5 acres at my house,  
7 I've found feather spots at my house, and I don't  
8 know if -- I don't know what caused it.

9 You do a 4-acre search on a wind turbine,  
10 you find somebody. And again, a small bird, often  
11 you don't find evidence that it actually collided  
12 with the turbine, you found a feather spot, maybe  
13 some scavenging, and that -- but the industry has  
14 just accepted we are going to assume everything you  
15 find underneath there is caused by the wind turbine  
16 because if you wanted to try to get at that source of  
17 bias, you probably would go do searches where there  
18 aren't turbines and search where there are turbines  
19 and try to basically estimate the background  
20 mortality and, you know. I don't know, it's -- it's  
21 measurable.

22 We did background at one study in  
23 Minnesota. We were looking at turbines. And then we  
24 are looking at plots away from turbines. And, you  
25 know, tried to just compare the two to try to get a

1 handle on how much background might be in those  
2 plots. And it was 1 in the background, 3 at the  
3 turbine. But we didn't correct for that, we just  
4 assumed, you know, we just tried to make the point  
5 there is some background.

6 Q. In all of those things you described at  
7 some length that can be done and need to be done,  
8 have not yet been done for this project, correct?

9 A. Some components have. Like WTBird tested  
10 the ability of the blade to pick up certain size  
11 vibrations and they got some false positives and they  
12 missed some, so they got a little bit of a "If a  
13 collision happens, will the -- will the sensors pick  
14 them up." But for this particular project, we have  
15 not estimated the -- those probabilities yet which  
16 is -- we got to get probability protection.

17 Now, the good thing is we are going to be  
18 out there looking at that turbine all the time, so we  
19 don't have to worry about scavengers, so to speak, so  
20 we don't have that particular factor. We do have the  
21 "what's the probability of detecting it," so we're  
22 going to have -- that's what things like the catapult  
23 test will do, to see what is the probability of  
24 actually something hits the blade, we pick it up  
25 either with the camera or the sensors.

1           Q.    Right.  And that has yet to be done,  
2 correct?

3           A.    Pieces have, right.  I said WTBird has  
4 done some tests.

5           Q.    Right.

6           A.    So pieces of it have.  They know that,  
7 you know, their vibration system can pick up --

8           Q.    If you throw a sand bag at it?

9           A.    Similar size, similar weight to birds,  
10 different birds.

11          Q.    But at an operating wind-turbine project,  
12 with the turbines running, have they -- they have not  
13 done, for this project, a verification of testing  
14 the -- is it thunk?  Is that what the sandbag is?

15          A.    I mean -- no.

16          Q.    I've heard -- what do you call it?

17          A.    I think one of the -- WTBird I don't  
18 think calls it "thunk."  I think we picked up that  
19 term.  Maybe one of the -- there is another  
20 researcher in the U.S. that's looking at thunk as  
21 well, so I don't know who is calling it "thunk."  We  
22 call it "thunk" because bird -- bird potentially hits  
23 the blade, "thunk."  Thunk detected.

24          Q.    WTBird, at this point, is throwing a sand  
25 bag at --

1           A.    No.  They've also detected bird  
2 collisions.

3           Q.    Okay.

4           A.    Have they quantified the probability  
5 completely?  No.  I don't believe -- I don't believe  
6 so.

7           Q.    All right.  To your knowledge, they  
8 haven't.

9           A.    To my knowledge, they haven't.

10          Q.    And that evidence hasn't been submitted  
11 yet to anybody in this proceeding, right?

12          A.    No.

13          Q.    Okay.

14          A.    That I'm aware of.

15          Q.    Page 23 of your testimony.

16                ALJ WALSTRA:  Question 23?

17          Q.    Excuse me.  Question 23, yes, page 11.  
18 Thank you.

19                "Do you agree with the assumption that  
20 higher numbers of birds flying through the rotor  
21 swept zone would result in higher mortality?  Why or  
22 why not?"

23                You state "It depends on species or  
24 groups of birds of interest and many other factors  
25 such as collision avoidance, weather, and turbine and

1 project characteristics. If comparing two projects  
2 with the same configuration of turbines of exactly  
3 same height and size, and more birds of the same type  
4 fly through the moving rotor of one compared to the  
5 other, I would expect on average, that the project  
6 with more birds would have more mortality." What do  
7 you mean by that?

8 A. Well, I am going to keep reading.

9 Q. Yeah, yeah, you can.

10 A. "However, it is impossible to get an  
11 exact number of birds that will fly through the  
12 rotors since risk assessments are conducted prior to  
13 the project getting built and data collection methods  
14 for nighttime surveys generally provide indices of  
15 overall activity during the time frame studied."

16 So what I meant was if you actually could  
17 get, when the project is built, the number of birds  
18 that fly through the rotor, two projects exactly the  
19 same, everything else equal, which isn't the case,  
20 but they are all producing the same amount at the  
21 same time on average over time, I would expect that  
22 there might -- and it was the same bird, same bird  
23 species, you might get more at the facility that had  
24 more of those birds passing through, but the other  
25 factors like, you know, avoidance and other things

1 need to be taken into account. Preconstruction --  
2 that's why I added the caveats. Pre-construction  
3 isn't during when the turbines are operating. And so  
4 pre-construction is not -- I haven't seen  
5 pre-construction indices of exposure at least for  
6 songbirds, okay, for songbirds, correlate with  
7 post-construction mortality.

8 Q. And in this project, this demonstration  
9 project, as it's been called in many contexts, you're  
10 not proposing a control project or setup of turbines  
11 to compare, to do the comparable comparison you were  
12 talking about, right?

13 A. I don't know what you just asked me.

14 Q. All right. Well, and I'm trying to  
15 figure out what you were telling me. What were you  
16 telling me?

17 A. Hypothetical, that was a hypothetical.

18 Q. That was a hypothetical of how you would  
19 test the theorem, right?

20 A. No. That's a hypothetical. I'm saying  
21 the only way, you know, for me to say that you would  
22 end up with, you know, more exposure equating to more  
23 mortality is -- and I'm just giving you a  
24 hypothetical, that control a lot of things and so  
25 let's put two wind projects and we're able to measure

1 exposure so some measure of exposure, not  
2 pre-construction but when the turbines are there.

3 Q. Right.

4 A. And measure an exposure rate and you  
5 actually knew it was birds, not, you know, birds or  
6 bats.

7 Q. Right.

8 A. And it was the same between the two  
9 projects, you know, on average I would expect that  
10 the birds, you know, the site that had more birds  
11 during operation of those two sites might have more  
12 mortality.

13 Q. Okay. And as you suggest, it's not  
14 practical to build the two sites to do that  
15 comparison.

16 A. That's a hypothetical and that's why I  
17 went on to say it's impossible to get the exact  
18 number of birds that will fly through the rotor. The  
19 good thing is, with the camera system, we are going  
20 to get really information on that which is when the  
21 turbines are up and the, you know, the camera system  
22 is going to give us good information on, you know,  
23 that exposure information as well as we will get some  
24 information on collisions.

25 Q. But again, that testing has not been done



1 for this project.

2 A. The turbines are not up so, no, I cannot  
3 do that.

4 Q. Right. Okay.

5 MR. STOCK: What number are we on?

6 ALJ WALSTRA: You will be at 19.

7 MR. STOCK: 19? Thank you.

8 (EXHIBIT MARKED FOR IDENTIFICATION.)

9 Q. Mr. Erickson, I've handed you what I have  
10 marked as Exhibit 19. Would you please take a look  
11 at that and identify it for the record.

12 A. It is a -- well, I am not -- is it the  
13 whole report? I actually -- obviously it says "Risk  
14 Reduction Avian Studies at Foote Creek Rim Wind Plant  
15 in Wyoming, by Dr. Dale Strickland, myself, Greg  
16 Johnson, Dave Young, and Rhett Good. I'm not sure  
17 the date on this. I am not sure -- maybe you could  
18 tell me where you got it since it --

19 Q. Well, I got it off the internet. It's  
20 got your name on it. Dale Strickland, Wallace P.  
21 Erickson, Greg Johnson, Dave Young, and Rhett Good.

22 A. Okay.

23 Q. All that, Western EcoSystems Technology,  
24 Inc., you recognize.

25 A. I recognize the people. I know the -- I

1 know the study in the sense that -- but I don't know  
2 if this is an interim report or a -- I know that it  
3 said it's -- we have only completed 10 months of an  
4 18-month study, so I don't know.

5 Q. All right. Let's take a look at it and  
6 go through it and --

7 A. Sounds good.

8 Q. -- figure out what it is.

9 Do you recall doing a study for SeaWest  
10 Energy Corporation regarding the Foote Creek Rim Wind  
11 Plant in Carbon County, Wyoming, in late 1996?

12 A. That's what I needed, the date. So  
13 that's 22 years ago. So, yes, I know I was involved  
14 in that back then, back in the heyday, you know what,  
15 there was only I think at that time this might have  
16 been one of the first projects built, you know,  
17 outside the Altamont, outside the California project.

18 Q. And also for your reference, if you look  
19 down at the footnote at the bottom, it says WEST,  
20 Inc., is that -- 2003, is that an address or is that  
21 a year?

22 A. No, that is an address.

23 Q. Okay.

24 A. That's an address. Yeah, it is an  
25 address. That was one of our offices when we had

1 about 10 people back then in 1996.

2 Q. Okay. So what were you doing in this  
3 project?

4 A. Well, in this project actually wasn't --  
5 you know, you said were you doing it for SeaWest.  
6 This was a study funded by the National Renewable  
7 Energy Lab. This was a long time ago so, you know, I  
8 need to read a little bit. Basically they were  
9 looking at whether the UV gel coat on the turbines  
10 might have some impact on the ability of birds to  
11 see. There was some controversy over whether birds  
12 can see in the UV or not, UV spectrum or not. So it  
13 was a study, daytime study really fo -- you know,  
14 focused on testing whether there might be an impact  
15 of UV gel coat on risk, on fatality.

16 Q. And how did you -- what was the  
17 methodology for the study?

18 A. Well, geez, this is a long time ago.

19 Q. Take a look at it.

20 A. Yep. In this particular example, back in  
21 1996, we did a before/after control/impact design.

22 Q. Okay.

23 A. And what was nice about -- I need to read  
24 it because I want -- again, I don't know what this  
25 specific document is. We had -- we actually ended up

1 with a pub -- NREL full publication later, so I don't  
2 know. You know, this looks to be an interim report  
3 and some summary that somebody found on the internet  
4 so. Let me just -- I need to read it again to see  
5 which part this is.

6 Q. Go ahead. Read it.

7 ALJ WALSTRA: We can go off the record.

8 MR. STOCK: Okay. Thank you.

9 (Discussion off the record.)

10 ALJ WALSTRA: We'll go back on the  
11 record.

12 A. I don't know what this report is, if it  
13 is a status report of some sort. Because I'm not  
14 sure -- okay. There is -- yeah, I don't specifically  
15 know if this is some sort of an interim report given  
16 it was only 10 months out of an 18-month study. May  
17 have been -- I know there is a more complete  
18 document. There is a full NREL report. Again, this  
19 was, you know, research, kind of Tier 5-type studies  
20 -- Tier 5 -- the Land-Based Wind Energy Guidelines,  
21 "Tier 5" often refers to research studies to ask  
22 questions. This one was focused on trying to see  
23 whether UV paint on blades might reduce risk,  
24 primarily of raptors in this case, so daytime birds,  
25 and NREL provided funding for that to take a look at

1     that.

2                   At that time, you know, in 1996, most of  
3     the data we had was from the Altamont on -- Altamont  
4     in California where the primary issue seemed to be  
5     raptors on the smaller turbines, there are much  
6     smaller turbines in the Altamont. So this was one of  
7     the first projects built after what we had for data  
8     in California. And so, in this case that's what we  
9     were going to look at. And in that case, in this  
10    sort of experimental setting, for this sort of  
11    research, we did a BACI design.

12           Q.     So explain to us what your methodology  
13    was.

14           A.     From this, I would rather have the full  
15    report, okay? I would rather have the full report  
16    but it's my understanding that we did surveys -- it  
17    depends on which component because there is several  
18    components, it looks like. And there is several  
19    pieces of data reported in here, like the results of  
20    use and fatality surveys if you look at the Figure 1.

21           Q.     Okay.

22           A.     On it says page 110 on the bottom. Okay.  
23    This was for the Avian-Wind Power Planning Meeting.  
24    Okay, I see the title up at the top.

25           Q.     Your name is on this, right?

1           A.    No, it was. I am just, it was 22 years  
2 ago. Okay?

3           Q.    Okay. All right.

4           A.    And we've done a lot of studies on wind  
5 projects.

6           Q.    Okay. Well, all right. Read it and then  
7 tell me what you remember.

8           A.    Okay. So, for example, on Figure 1, and  
9 it looks like we summarized things that we were doing  
10 at Foote Creek Rim, and it was a summary of risk  
11 reduction studies, and it was an example, 1996,  
12 pretty new technology outside California.

13                   So in that study there was bird -- bird  
14 surveys, you know, because the primary concern here  
15 was raptors. And so there were point count surveys.  
16 So surveys for live birds during the day. I think  
17 they were 20-minute surveys at points sampled in the  
18 study area. And, you know, maybe done weekly. I'm  
19 not sure how frequently. It wasn't done daily.

20                   And the data on the left basically showed  
21 that most of the eagle activity, these were eagles,  
22 Golden Eagles, occurred along the rim edge. And it's  
23 a tabletop mesa, wind comes up on the left and  
24 what -- from the west -- the left -- the west. And  
25 most of the activity for the raptors was found along

1 that rim edge; not uncommon. For people like Caleb,  
2 he would be able to explain it a lot better than me,  
3 because he has a lot more experience on the bird  
4 side. But -- and so basically in this particular  
5 project, because it was a raptor concern, SeaWest  
6 agreed to move the turbines back a little ways away  
7 from that rim edge to try to reduce risk.

8 The next one -- and that was a -- you  
9 know, that right there was just data collected on the  
10 project.

11 Q. Okay.

12 A. Okay. For that graph. And I think what  
13 we were going to do was also we talked about -- okay.  
14 Aerial surveys. And Icebreaker, as you guys know, we  
15 won't have to worry about raptor nests or any birds  
16 nesting on the facility.

17 There was a study to look at Mountain  
18 Plovers at that site, whether there was any  
19 displacement impacts of Mountain Plovers. It is a  
20 small shore bird. So at the top of page 111, it  
21 talks a little bit about those data.

22 Q. Okay.

23 A. And so that was primarily -- that's a  
24 long time ago, so I'm not -- I can't say for sure  
25 because this is just a summary of things. I can't

1 recall exact study design, but I think they did  
2 transects in the project area, you know, to look at  
3 plover nests before and after the project was built.

4 Q. Okay.

5 A. Just a before-and-after study, I believe  
6 there, to see if there was any potential displacement  
7 of those birds that nested near the turbines.

8 Q. Okay. And then there is a UV study,  
9 right?

10 A. Yeah. UV study, it's summary of 10 out  
11 of 18 months. And what I recall is -- I may be off a  
12 little bit, 22 years is a long time.

13 Q. That's fine. I want your recollection.

14 A. Okay. We say use was higher, .24  
15 observations per point count at the non-UV turbines  
16 versus the UV turbines. So that was one measure, is  
17 there -- was there more activity and so just that was  
18 an activity-based one.

19 Q. And what does that mean?

20 A. Exposure, you know, you are trying to get  
21 information on whether the -- so it's from the point  
22 count data. Did you see more birds, more eagles? In  
23 this case was it eagles? That one was raptors. More  
24 raptors in the area where the UV-reflective paint was  
25 on compared to the other one. So that wasn't a --



1 and that particular case we -- we couldn't control  
2 which turbines had the UV on, UV paint. It was first  
3 phase, and then the second phase they were able to  
4 put it on, so. You know, a little bit challenged  
5 there to tease out, you know, the effect of UV. But  
6 we were using behavior data, in this case, to try to  
7 see if there was an impact because in this case,  
8 again, with fatalities, you don't -- you don't have  
9 a -- probably in this case you end up with not enough  
10 fatalities. If you look at it, we did try to compare  
11 non-UV to UV for both use and fatality.

12 Q. Okay.

13 A. We didn't have enough raptors, and that  
14 was the primary focus was raptors and eagles, raptor  
15 fatalities to do that comparison.

16 Q. Okay. And then if you go down to the  
17 "Conclusions" on page 112, it reads: "Fatalities at  
18 all three wind power sites discussed above appear to  
19 be primarily nocturnal migrating passerines. Was  
20 that what you, the WEST team, determined?

21 MR. SECREST: Let me just note an  
22 objection as to "determined" and "conclusions." As  
23 Mr. Erickson noted, he believes this is a draft  
24 report, and the study was in progress.

25 MR. STOCK: I am reading under the

1 heading "Conclusions."

2 ALJ WALSTRA: I will allow him to  
3 clarify.

4 A. I mean, again, this is a document on the  
5 web. It was -- you know, it was basically part of  
6 one of the NWCC, National Wind -- used to be Wind  
7 Power Planning Meeting, used to be the National Avian  
8 Wind Power Planning Group. This became the National  
9 Wild -- Wind Wildlife Coordinating -- NWCC, National  
10 Wind Coordinating Collaborative, okay? I think  
11 that's what it's called now. It's an organization of  
12 all stakeholders where they do meetings every two  
13 years or so to present research on wind and  
14 wildlife --

15 Q. Okay.

16 A. -- issues. So -- so --

17 Q. We are down to "Conclusion."

18 A. Yep.

19 Q. On page 112 it reads: "Fatalities at all  
20 three wind power sites discussed above appear to be  
21 primarily nocturnal migrating passerines."

22 A. Yeah. That's well known.

23 Q. Was that true for that -- the study you  
24 were conducting?

25 A. Yeah, not really surprising.

1 Q. Okay.

2 A. Nocturnal migrating passerines are the  
3 most common sort of bird group. You know, we've  
4 heard -- I think in my testimony there's -- well --  
5 it has to be in the billions in terms of population  
6 sites. You can actually -- there are some data  
7 available to try to calculate the population size  
8 of -- of songbirds and most of them migrate, so you  
9 can find out how many live in the U.S., and they are  
10 by far the most common. And -- and so they are the  
11 most common group of birds that are found at wind  
12 projects mainly because they are by far the most  
13 common out there.

14 Q. Okay. All I was asking is if this was  
15 the conclusion that was reached from the study.

16 A. Yeah.

17 Q. Okay.

18 A. I just wanted to give some context here,  
19 make sure everybody was on the same page.

20 Q. Well, I am trying to stay on page 112  
21 actually.

22 A. Okay.

23 Q. "While no comparable estimates exist for  
24 most wind plants, Howell and Noone (1992) estimated  
25 that bird fatalities at wind plants around the world

1 range from 0 to 37 birds per turbine per year.  
2 Fatalities and bird use at all three of our study  
3 sites are on the low end of this range. Our data  
4 suggest a link between abundance of some species and  
5 the risk of fatalities within a wind plant and  
6 suggest that sites selected for wind power should  
7 have relatively low bird use (e.g. Buffalo Ridge and  
8 Vansycle)." That was one of the conclusions set  
9 forth in this document, correct?

10 A. In 1996, 22 years ago, that's what I  
11 said. I want to make sure it's clear here that the  
12 link between abundance, I would say for this -- for  
13 this study was primarily raptors at Foote Creek Rim,  
14 raptors at Foote Creek Rim, it's a high raptor-use  
15 area. Relatively high raptor-use area, so that's  
16 probably the link and --

17 Q. But the fatalities were primarily  
18 nocturnal-migrating passerines, right?

19 A. Yes, but if you look at the fatality  
20 rate, for example, at Foote Creek Rim for small  
21 birds, they're low. They're low for all three of  
22 these when you look at the all-bird numbers. Now,  
23 remember, in 1996, we didn't have much to go on for  
24 fatality rates.

25 Q. Well, this is not referring to other

1 people's data. This is referring to "Our data  
2 suggest to link," right? Isn't that what's stated in  
3 this?

4 A. Yeah. And like I said, Foote Creek Rim,  
5 Foote Creek Rim, the primary concern there was  
6 raptors and there has been a link, in fact, you know,  
7 the Golden Eagle Bayesian Model that they use to  
8 predict mortality of Golden Eagles, they assume that  
9 exposure and use relate to fatality for raptors.  
10 That just hasn't been established in other species.

11 Q. Well, that qualification you just gave me  
12 does not appear here, right?

13 A. Oh, it doesn't. But this is a summary of  
14 a bunch of studies -- a bunch of studies we did at  
15 Foote Creek Rim.

16 Q. And then you state "When bird use of a  
17 chosen wind plant site is relatively high, then the  
18 construction plan should avoid high use areas (e.g.,  
19 FCR edge,...." What's FCR edge?

20 A. That's that raptor analysis we did in  
21 Figure 1, so that's raptors.

22 Q. All right. "Wetlands, woodlands,"  
23 correct?

24 A. At that time, at that time we made that  
25 statement there was three -- three wind projects that

1 had any information. I think -- well, other than the  
2 California ones, there was about three, Buffalo  
3 Ridge, Vansycle and Foote Creek Rim, during that time  
4 were about the only studies that were for bigger --  
5 bigger turbines outside California.

6 Q. But, again, you weren't relying upon data  
7 from other studies. You were saying "Our data  
8 suggest a link," correct?

9 A. Well, and again, the "link," Foote Creek  
10 Rim edge, that refers back to we saw more use along  
11 the edge of the rim of raptors and that is -- and so,  
12 they agreed to site the turbines back away from that  
13 rim edge by 30 meters or so, 50 meters, and so that's  
14 what it's referring to, the Foote Creek Rim is that.

15 MR. STOCK: All right. Those are all the  
16 questions I have. Thank you.

17 ALJ WALSTRA: Thank you.

18 Staff, do you have an estimated cross?

19 MR. JONES: Not very much, I think  
20 Mr. Stock covered a lot of them. Probably about 15  
21 minutes, 20 minutes.

22 ALJ WALSTRA: All right. Go ahead.

23 MR. JONES: Maybe not even that. We'll  
24 see.

25 - - -

1 CROSS-EXAMINATION

2 By Mr. Jones:

3 Q. Good afternoon, Mr. Erickson. My name is  
4 John Jones. I represent the Staff.

5 A. Good afternoon, Mr. Jones.

6 ALJ WALSTRA: Could you turn your  
7 microphone on.

8 MR. JONES: Yes.

9 Q. Okay. Mr. Erickson, I would like to  
10 refer your attention to page 3 of your testimony.

11 A. All right. All right.

12 Q. And --

13 A. I apologize.

14 Q. That's okay. Let me know when you are  
15 there.

16 A. With this loose stuff, I didn't do so  
17 well here, so let me get organized.

18 MR. STOCK: I think it might be at Tab WW  
19 in your binder if you have it there.

20 THE WITNESS: Thank you.

21 A. Okay.

22 Q. That's page 3.

23 A. Yep.

24 Q. On page 3, lines 1 through 6, you state  
25 that you coauthored, with Dr. Caleb Good, 2016 Risk

1     Assessment and Aerial Waterfowl Survey which was  
2     provided in Icebreaker's Application; is that  
3     correct?

4             A.     Yeah. I did the risk assessment and then  
5     the survey report.

6             Q.     Okay. Then on page 4, you state, from  
7     lines 1 through 7, that your testimony, together with  
8     the other Icebreaker's witnesses testifying in this  
9     case, will confirm that Joint Exhibit 1, which is the  
10    Joint Stipulation, represents the minimum adverse  
11    environmental impact. Do you see that?

12            A.     I do.

13            Q.     Okay. Now, your testimony is -- your  
14    testimony is limited to that part of the study that  
15    you did, right, from page 3, with Mr. Gordon --  
16    Dr. Gordon, the risk assessment?

17            A.     Could you repeat the question?

18            Q.     Yes. You said that your testimony,  
19    together with other Icebreaker witnesses, confirmed  
20    that the Stipulation supports a finding by the Board  
21    that it represents the minimum adverse environmental  
22    impact, correct?

23            A.     Correct.

24            Q.     But your testimony and your opinions are  
25    contained within the 2016 Risk Assessment, right, the



1 results from that assessment?

2 A. As well as the aerial survey.

3 Q. Okay. And, furthermore, on page 4, on  
4 lines 9 through 12, you state that you reviewed parts  
5 of the Staff Report; is that correct?

6 A. Yes.

7 Q. And that you read the parts dealing with  
8 ecological impacts on the birds and bats of the  
9 project; is that correct?

10 A. Correct, correct.

11 Q. Okay. And I don't know if you have a  
12 copy of the -- do you have a copy of the Staff Report  
13 up there?

14 A. I assume so. I need to be directed to  
15 it. Where would that be?

16 MR. SECREST: Here is what it looks like.

17 THE WITNESS: Is it -- there we go.

18 Q. And if you can turn to page 23. And this  
19 what you are referring to, you read -- you reviewed  
20 pages 23 through 25, that section under "Avian and  
21 Bat Species"?

22 A. I know I read those sections, yes.

23 Q. Okay. And did you happen to review the  
24 ecological conditions on page 47 of the Staff Report?

25 A. Page 47.

1 Q. Yes.

2 A. I believe so, but I'm probably going to  
3 read them again if you are going to ask me questions  
4 about it, so.

5 Q. Yeah. Page 47 through 49 under  
6 "Ecological Conditions." Those are the 15 through  
7 26. Did you happen to review those as well?

8 A. I believe so.

9 Q. And for your part in this case, are you  
10 giving any opinion then on Staff Conditions 19, 22,  
11 or 24?

12 A. I guess potentially related to the risk  
13 of the project.

14 Q. Okay. Well, I want to refer to page 47,  
15 Condition 19.

16 A. Yep.

17 Q. Okay. And Condition 19, you can read it  
18 there. It's short. It goes over to page 48. Are  
19 you familiar with this condition?

20 A. I have been in here the last few days.

21 Q. So you would be. All right.

22 A. And I read it before we got here.

23 Q. Dumb question. And do you have an  
24 opinion on Staff Condition 19?

25 A. An opinion. I guess I would like -- an

1 opinion.

2 Q. An opinion as in comparing the standard  
3 that staff is proposing for Condition 19 compared to  
4 the Stipulation Condition 19 as to what standard is  
5 being proposed by Icebreaker.

6 A. I probably should have them side by side.

7 Q. Yes, if you want to refer to the Joint  
8 Stipulation as well.

9 A. Well, and where is that?

10 MR. SECREST: If you --

11 MR. STOCK: VV in Mabee's.

12 THE WITNESS: All right. Which binder?

13 MR. SECREST: Todd's.

14 THE WITNESS: I know Todd's, but find it,  
15 where does it say the name? Oh, there it is. That's  
16 Rhett's. There we go. David, Caleb, Wally, Todd.

17 A. All right. Which tab?

18 Q. That would be Condition 19 in the Joint  
19 Stipulation on page 6.

20 ALJ WALSTRA: VV.

21 A. VV.

22 Q. Oh, VV, sorry.

23 A. Okay. Which page again?

24 Q. Page 6 of the Joint Stipulation,  
25 Condition 19.

1           A.    Okay.

2           Q.    Now, looking at -- if you would look  
3    through that Condition 19 and the Joint Stipulation  
4    on page 6, as compared to the Staff Report Condition  
5    19, do you have an opinion on the difference between  
6    those two standards?

7           A.    I guess the only thing, since I'm really  
8    focused on the risk piece, would be I guess I'll  
9    identify a difference. One contemplates shutting --  
10   having the turbines shut down from dusk to dawn from  
11   March through January, and the other one looks at  
12   feathering the last -- the last statement in the  
13   Joint Stipulation, feathering up to 30 minutes prior  
14   to sunset to 30 minutes after sunset during peak  
15   spring and fall migration periods when cloud ceilings  
16   are low.

17          Q.    So you understand -- I think you were in  
18   the room when you heard Mr. Good's testimony --

19          A.    Yes.

20          Q.    -- on Condition 19?

21          A.    I was in the room.

22          Q.    Okay. And so do you recall him  
23   testifying that when you look at that condition and  
24   factor in that it would be feathered up to 30 minutes  
25   prior to sunset, 30 minutes after sunrise, during

1 peak spring and fall migration periods when cloud  
2 ceilings are low that we are -- that condition is  
3 talking about possibly 5 to 10 days for both seasons?

4 A. I don't recall him saying that. You  
5 know, it would depend on what the cloud ceilings  
6 were, so I don't -- I don't know. I don't recall him  
7 saying that. He may have, but I don't remember.  
8 It's been a long week.

9 Q. So cloud ceilings are not something you  
10 would see typically every day, would you, or maybe  
11 even every week?

12 A. There is always a cloud ceiling. It's  
13 just what is the ceiling, so. There's always a  
14 ceiling to the clouds.

15 Q. I'm sorry. When are they considered low?

16 A. Well, it's my understanding there were  
17 some definitions potentially put forth in the BBCS.  
18 I believe it was to the rotor tip height or maybe a  
19 little higher was a, you know, something that was  
20 thrown out there as a potential idea for that.

21 Q. And so do you happen to know then what  
22 the height is for being low in this context?

23 A. Well, all I know is what was put forth in  
24 the BBCS, so I think it was around tip height. The  
25 idea there is, you know, compressing -- compressing

1 birds during that time making them more at risk.

2 Q. And so outside of when the cloud ceilings  
3 are low during nocturnal migration periods, you still  
4 have -- you still have migration going on, right, of  
5 nocturnal birds and bats?

6 A. You do. Typically most of the birds are  
7 above the turbines then.

8 Q. Uh-huh. When you say "most," there's --  
9 what do you mean by "most"?

10 A. Well, if you look at most of the  
11 nocturnal, you know, Archibald, for example, and  
12 other studies that have been done on nocturnal  
13 migration, most of the birds are flying at -- you  
14 know, 80, 90 percent are flying above the turbine  
15 height.

16 Q. So you would have 10 to 20 percent flying  
17 within the rotor-swept zone?

18 A. If those data -- I mean, if that's what's  
19 occurring during that migration season.

20 Q. Uh-huh.

21 A. You know, that's the exposure number.

22 Q. But you don't know what the density is?

23 A. I don't know that. I don't know because,  
24 I mean, I'm just quoting a general statement about  
25 nocturnal bird migration --

1 Q. Uh-huh.

2 A. -- based on the data that's out there.

3 Q. So if you look at both proposed  
4 conditions from the Stipulation and the Staff Report,  
5 both of them provide for the flexibility that the  
6 plan, as to the technology for the plan,  
7 post-collision monitoring plan, could be demonstrated  
8 after construction; is that the way you understand  
9 those conditions?

10 A. You know, this is one area that I really  
11 have been trying to not pay attention to because I  
12 get really confused and I have no opinion on -- on  
13 that. I haven't been involved in the -- any  
14 negotiations on the monitoring plan or the  
15 stipulations. So I don't have an opinion on that and  
16 I --

17 Q. Okay. So that's fair, that's fair. So  
18 you don't have an opinion on minimum adverse as to  
19 which standard would meet the minimum adverse in this  
20 case.

21 A. Oh, I do know that this is an extremely  
22 low risk project. So from a risk perspective going  
23 in, this is, we predicted, a very low risk project  
24 for a lot of good reasons, okay? We have direct  
25 fatality data that says the range in the region has

1    been about 1 to 7 birds per megawatt. Data in this  
2    area where the project is going to be, the waterfowl  
3    surveys, the NEXRAD, the fact that there are no --  
4    there isn't any habitat for resident birds as well as  
5    raptor, resident raptors, and they are not going to  
6    be out there spending time foraging, that it's a  
7    really low risk site.

8                    You know, we talked about, I think our  
9    original risk assessment said 1 to 2 birds per  
10   megawatt. And that involved -- that involved studied  
11   close to the shoreline, Heritage Garden is very close  
12   to the shoreline in Lake Michigan and is really low  
13   mortality. So we did have sites that were close to  
14   the thing, to the Lake. And so I believe it's, you  
15   know, a very low risk site.

16                   We say 20 to 40 birds, so if you take six  
17   turbines, 20 to 40 birds, and that was our most  
18   probable in our original risk assessment, take that  
19   and divide it by 6 for turbine -- actually, let's not  
20   divide it by 6, we could, but let's leave it at 20 to  
21   40, and put that in a 365-day period, that's one  
22   every 5 to 10 days, a bird strike, is what we  
23   predicted. So it's very low from the start.

24                   Q.    So does Staff Condition 19 contradict  
25   your low impact findings?



1           A.    Does Staff Condition 19 contradict my  
2 findings. Well, I don't see -- I guess what I would  
3 say is the amount of potential curtailment that could  
4 occur for a site that's so low risk to me in  
5 practice, seems a little bit out of the ordinary.

6           Q.    Okay.

7           A.    And I would go on to say that the -- and  
8 so feathering -- feathering 10 months out of the year  
9 just didn't -- in general terms that's close to, you  
10 know, 80 percent of the year, and then it's only at  
11 night, so maybe 40 percent of the time, that -- that  
12 seems -- seems a lot for such a low-risk site,  
13 just -- and I am not talking about the -- you know,  
14 from that standpoint it seems a lot.

15          Q.    But you would agree with me that -- that  
16 during migration periods that there is a heightened  
17 risk to birds and bats, that object coming through  
18 the project site; would you agree with that?

19          A.    Well, I think, yeah. I mean, projects  
20 across the -- the U.S. have shown a little higher  
21 mortality during spring, maybe a little bit higher in  
22 fall but there was mortality throughout the year at  
23 those projects. Now, those projects, you know, they  
24 are taking -- potentially taking resident birds so,  
25 you know, you look at the graph like in my testimony

1 and one of the attachments, it kind of shows that  
2 pattern.

3 So, yeah, they are a little bit more but,  
4 you know, for example, I think there was previous  
5 discussion of large events, you know, mortality  
6 events. There hasn't been large mortality events at  
7 all the wind projects that have been studied in the  
8 U.S. other than I think there was one at -- in  
9 Buffalo Ridge, Minnesota, and we are talking now tens  
10 of thousands of turbine searches, lots of turbine  
11 searches. There hasn't been that sort of -- those  
12 sort of big events.

13 So, you know, is it more risk during the  
14 peak migration period -- seasons? I would say yes,  
15 but it's -- we're still talking about very low  
16 numbers in terms of fatality.

17 Q. Right. But your study looking at on-land  
18 facilities compared to the offshore facilities being  
19 proposed in this case, attraction is a factor, right,  
20 that's just unknown, but comparing land to over  
21 water, right? I mean, we just -- what do you say  
22 about that?

23 A. Well, I mean I would start with, you  
24 know, let's compare an offshore project to an on-land  
25 project, okay? One of the biggest differences is

1   there isn't any risk for those resident birds that  
2   reside there. And if you look at -- you look at my  
3   publication on songbird, Horned Larks is one of the  
4   birds that is found -- has been found the most often  
5   at land-based projects. It does migrate, but some of  
6   the mortality is occurring during that resident --  
7   resident time, so.

8               So, you know, is the offshore environment  
9   unique? In some ways it is because there isn't any  
10   habitat for raptors and songbirds so, from this  
11   standpoint, those -- those species aren't at risk.

12              This is a demonstration project. It's a  
13   small project. So six turbines and having to  
14   contemplate, in this case, 10 months of curtailment?  
15   You know, just -- from the science perspective, I  
16   struggle with that, given it's such a low-risk  
17   project.

18              Q. Well, my point is when you factor in the  
19   unknown of the attraction at this 8- to 10-mile piece  
20   here out in the Lake and knowing that, you know,  
21   birds are traveling at a further distance and might  
22   see this and stop, you know, to rest or whatever,  
23   that's different than being on land, they have many,  
24   many places they could stop, but being out in a Lake  
25   is different, would you agree?

1           A.    Yeah, birds migrating across waterways, a  
2   lot of the birds that end up maybe crossing Lake  
3   Erie, that's 50 miles or so, you know, roughly, a  
4   little Google Earth calculation it's about 50 miles.  
5   You know, these birds, some of these birds are the  
6   ones that are coming across the Gulf of Mexico and  
7   having to fly 600 miles, over 600 miles. So from  
8   that standpoint, is it a really big sort of jump?  
9   You know, I don't know exactly how far. And I'm  
10   guessing that the migrants vary by species, depending  
11   on weather, how far they travel in a day. But some  
12   have to travel six-, seven-hundred miles to get  
13   across the Gulf of Mexico. So, from that standpoint,  
14   50 miles doesn't seem so much. A lot of it will  
15   depend on when they, you know, if it's in the  
16   morning, getting light and they're closer to this  
17   side of the Lake, I think Robb Diehl actually said 28  
18   kilometers or so, you might see this dawn ascent and  
19   then return.

20                So I -- so I guess I don't -- and as far  
21   as attraction, I guess the biggest concern I would  
22   have with attraction and what I've seen at land-based  
23   wind projects, a wind project for example that had a  
24   battery -- floodlit battery substation next, so  
25   sodium-vapor lamps, they had higher mortality. This

1 project doesn't have that.

2 Buildings, lights on buildings, that  
3 attraction, I've seen it with songbirds and, you know  
4 solid lighting, sodium-vapor lamps. Not on wind  
5 turbines. The lighting on wind turbines has not been  
6 shown to be an attraction. So from the birds'  
7 standpoint -- now, if they get up there and they're  
8 20 miles out and they go up higher, that's at least  
9 what some of the literature says, and they look to  
10 see where the nearest land is, do I anticipate them  
11 seeing turbines and seeing land and deciding to land  
12 on turbines? I don't know, I can't speculate on  
13 that.

14 Q. But would you agree that Staff's  
15 Condition 19, with the standard that's being  
16 recommended by Staff, that they are minimizing the  
17 risk during the whole migration season, not just  
18 during the peak time when there is low cloud  
19 ceilings; is that correct?

20 A. Well, I would say the project is already  
21 really low risk. I am not sure I could tell the  
22 difference between the risk that the project has and  
23 very -- even, you know, the risk of the project right  
24 now is very low, extremely low, okay? Six turbines,  
25 20 to 40 birds per year, you know, I'm not stealing

1 from Caleb because I wrote several studies on this,  
2 but, you know, one to three feral cats in Cleveland  
3 probably would take care of that.

4 I would point out too on land, you talked  
5 about comparison on land projects, one thing this  
6 project doesn't have that on-land projects have are  
7 overhead power lines, and they are -- you know, if  
8 you look at graphs of bird mortality, I think there's  
9 an exhibit that shows the mortality of birds by  
10 different anthropogenic sources. So overhead lines  
11 is a source, it's one of the higher sources. So a  
12 land-based project would have that, this project  
13 doesn't, so another factor that makes it lower risk.

14 Q. Well, like I said, this is a -- this is a  
15 unique project, the first of its kind on freshwater.  
16 There's been no other projects like this that are in  
17 operation or even been constructed, and so  
18 considering that information, and like I said, you  
19 have information as to, you know, activity above  
20 146 meters, but you're not certain as to what's below  
21 147 meters, wouldn't it be best to go on the safe  
22 side and provide protection during the whole  
23 migratory season?

24 MR. SECREST: Object to form,  
25 characterization.

1           A.    Could you repeat the question?

2           Q.    Yeah.  Wouldn't it be safer to go with  
3   Staff's condition, providing protection for the whole  
4   migratory season as opposed to just a small sliver of  
5   that season?

6           A.    I don't know what you mean by "safer."  
7   What do you mean?

8           Q.    For the birds, for birds and bats to  
9   prevent mortality.

10          A.    Birds or bats to prevent mortality, safer  
11   for birds, prevent -- I mean, I think already the  
12   mortality is going to be really low at this site.  
13   You know, this is -- you know, I hate saying things  
14   like that.  I am a scientist but, you know, is it the  
15   lowest risk project I've ever worked on?  I'm having  
16   a hard time finding one that's lower risk, and it has  
17   to do with the number of wind turbines, it has to do  
18   with you're not going to have mortality of resident  
19   songbirds, resident raptors, the waterfowl densities  
20   were low in that area.

21                The other thing with waterfowl is they  
22   tend not to be very at risk when it comes to  
23   collisions, even on land, you know.  There's places  
24   in Texas with all kinds of Sandhill Cranes that fly  
25   through an area.  They tend to avoid -- be able to

1     avoid turbines. And the -- and -- so the primary  
2     concern seems to be migrant songbirds by, you know,  
3     based on what we've heard and based on what we've  
4     addressed in our risk assessment. And migrant  
5     songbirds, the mortality has been pretty even keel  
6     across projects. So I guess I don't see that as a --  
7     so I still go back to I think this is a really low  
8     risk project.

9             Q.     Okay. All right. Do you agree that the  
10    potential for birds and bats to collide with the  
11    project infrastructure, during the project's  
12    operational phase, is of primary importance for the  
13    project and for Icebreaker's post-collision  
14    monitoring plan?

15            A.     Could you say that again?

16            Q.     Yeah. Do you agree that the potential  
17    for birds and bats to collide with the project  
18    infrastructure, during the project's operational  
19    phase, is of primary importance for the project and  
20    for Icebreaker's post-construction monitoring plan?

21            A.     Primary concern -- read the last part.

22            Q.     Yeah. Having a -- having a good  
23    post-construction collision monitoring plan is of  
24    critical importance to the project, right, to  
25    Icebreaker?



1           A.    It is a very low risk project, but I  
2    think given -- I think LEEDCo is committed to doing a  
3    robust post-construction collision monitoring  
4    program.

5           Q.    And you agree that the well-established  
6    methods for monitoring such impacts at land-based  
7    wind-energy facilities cannot be performed at an  
8    offshore facility such as this project?

9           A.    If you're talking about searching for  
10   carcasses underneath the turbines by humans, I think  
11   we have some safety issues, so no.

12          Q.    And do you agree there are no proven  
13   effective technologies currently available to perform  
14   bird/bat collision monitoring at offshore wind energy  
15   facilities?

16          A.    I struggle with that question because I  
17   think there's -- many of the components are there  
18   that are proven to document collisions. Their --  
19   and, in fact, I like the idea that we are going to  
20   get data all the time, both on exposure and  
21   collision. And so with the camera system, the camera  
22   is up, taking video of the rotor-swept area and the  
23   surrounding area, and then the thunk protector  
24   potentially. So it's going to be in place, not like  
25   carcass searches, right, every other, you know, every

1 other week or so.

2 And you know what, I keep talking and  
3 didn't answer the question, so. Repeat the question.  
4 I'm sorry, guys. It's late in the day and we all  
5 want to go home.

6 Q. That's all right.

7 Do you agree that there are no proven  
8 effective technologies, currently available, to  
9 perform bird/bat collision monitoring at offshore  
10 wind energy facilities?

11 A. I struggle with the proof. And I know  
12 that components have been proven. Components have  
13 shown that you can detect collisions.

14 Now, it's a matter of getting at the  
15 probability of detection and so there's work to be  
16 done to get at the probability of detecting those,  
17 but we know that cameras can, and it's determining  
18 when they don't, when they miss them. We know that  
19 thunk detector can pick up some collisions. We need  
20 to know when they pick up false positives and when  
21 they might miss things and, you know, that's what  
22 we're going to be doing if we get the grant, the  
23 grants that we put in or others, somebody is going to  
24 have a million dollars to be trying to completely  
25 prove out and put probabilities of -- probabilities

1 to that.

2 Q. And at the present time, Icebreaker  
3 continues to evaluate the developing technologies and  
4 available options; is that correct? For a  
5 post-construction monitoring plan?

6 A. I know that I have been, over the last  
7 several months, as we get prepared to submit this DOE  
8 grant, and I'm part of the LEEDCo team and WEST team  
9 that's doing that.

10 Q. And given that Icebreaker has, say,  
11 approximately three years to select its collision  
12 monitoring plan and demonstrate that it's efficient,  
13 that's -- that's a lot of time to be able to do that;  
14 is that correct? Would you agree to that?

15 A. Is that a lot of time?

16 Q. Three years.

17 A. That is three years.

18 Q. So when do you expect to have the project  
19 built?

20 A. I am not building it. Is it 2021, start  
21 of construction? I believe that's my understanding  
22 is 2021, but.

23 Q. So say fall of 2021 it's built, so fall  
24 of 2018 to fall of 2021?

25 A. That is three years, yeah.

1           Q.    Three years.  And given what you know  
2   right now, you testified to these other projects  
3   elsewhere that is experimenting with this technology,  
4   new technology, like the I believe WTBird technology  
5   and the vibration sensors in the blade or the thermal  
6   cameras, acoustics, I mean, there are all sorts of  
7   things that are being considered, right, in the  
8   industry for -- try to come up with a reliable  
9   detection system; is that correct?

10           A.   Well, there is a lot of effort being done  
11   to develop and refine technology right now and that  
12   is true.  I think the -- you know, I guess how  
13   would -- I want to ask you a question.  I can't do  
14   that.  So, I mean, there's a lot of effort being done  
15   to try to refine and, you know, refine the  
16   technology.  And part of it is needing multi-sensors,  
17   you know, cameras and thunk detector cameras, looking  
18   different ways, night, day, so there's a lot of  
19   effort being put to developing that.

20           Q.   And so how -- where do you see that  
21   development over the next three years?

22           A.   Where do I see it going?  Getting better.  
23   Getting better over those three years because there  
24   is a lot of effort and money being put into it.

25           Q.   And does Icebreaker plan to partner with

1 another facility to test -- to test any technology  
2 for a plan?

3 A. Well, I do know the proposals we're  
4 developing for DOE, at least the ones I'm involved  
5 in, do expect to do that on an on-land facility but,  
6 you know, in that case, the DOE proposal that -- and  
7 money we are going after, you know, I don't know if  
8 we'll get that money or not but I -- you know, so  
9 that's -- but we are basically working under the idea  
10 that we, you know, the collision monitoring  
11 technology will need to be tested on turbines on  
12 land.

13 Q. Well, knowing what you know today and  
14 where things are as far as the technology, would you  
15 say that it's likely that you could demonstrate your  
16 technology being reliable for your plan within those  
17 three years?

18 A. Well, I would say it's not necessarily my  
19 technology. So I think there's a lot of effort being  
20 done to prove it. And a lot of resources put forth  
21 to prove it on land and in field tests. Field tests  
22 on land and at on-land turbines.

23 Q. Okay. Let's just look at 22(c) here  
24 quickly. If you look at page 7 of the Joint  
25 Stipulation and then also compare that -- I will wait

1     until you're there.

2             A.     I am.

3             Q.     Okay.  And if you still have the Staff  
4     Report there in front of you, 22(c) in the Staff  
5     Report.

6             A.     Okay.

7             Q.     And have you -- have you reviewed either  
8     one of these sections from either the Stipulation or  
9     the Staff Report?

10            A.     Oh, I've heard a lot about them; and,  
11     yes, I think I have read them.  Is this the radar  
12     one?

13            Q.     Right.

14            A.     One with the radar.

15            Q.     Right.  And so in order to have a quality  
16     data, and to rely on that, to determine activity in  
17     the project area for birds and bats, would you agree  
18     that the higher the percentage for -- to have for  
19     quality data, the better?

20            A.     Better for what?

21            Q.     For having a good survey to know what's  
22     in the project area for activity.

23            A.     I guess it depends on how you measure  
24     "better."  I mean, one of the things that you do in  
25     designing studies is you collect adequate information

1 to ask the question. And so, is more data better?  
2 It might reduce your variance some, but it doesn't  
3 necessarily mean you can't answer the question.

4 Q. So, okay. Let's look in terms of the  
5 survey then. How much quality data would be, to have  
6 a successful survey, to be able to have to rely on  
7 it, what percentage would you say that would be?

8 A. You know, I don't know if we're talking  
9 about -- are we talking about generally?

10 Q. I am talking in relation to the  
11 80 percent that the Staff is recommending for a  
12 standard.

13 A. I suspect, given that we are going to do  
14 this pre- and post-comparison that I'm guessing that  
15 could you get by with less than 80 percent to answer  
16 questions about are we seeing differences in, say,  
17 altitudes of biological targets as measured by radar,  
18 pre and post, you know, and looking at displacement.  
19 And one thing, we could probably get pretty good  
20 information about whether you see birds avoid  
21 turbines with a lot less data, for example, if you  
22 are really looking at the behavior of the birds.

23 And I should point out that, for example,  
24 and this is tied to radar, but in the  
25 post-construction period, once the collision

1 monitoring system is up, we are going to get a lot of  
2 really good information on bird behavior around the  
3 turbine and we're actually going to -- you know,  
4 radar gives you an index to activity. It gives you  
5 an indices to activity. And things like the camera  
6 system in post-construction is going to get you  
7 really good information on what's happening relative  
8 in the post-construction time frame.

9 And if I could just point out, if the DOE  
10 grants move forward with LEEDCo, you know, they  
11 propose potentially collecting some of the camera  
12 data on the barge pre-construction as well.

13 MR. SECREST: Your Honor, may I interrupt  
14 for a moment? I have been with Mr. Erickson quite a  
15 bit, and he is too proud to say it, but I can tell he  
16 is getting worn down and tired, so I just wanted to  
17 note that for the record.

18 ALJ WALSTRA: That he appears tired?

19 MR. JONES: I have --

20 ALJ WALSTRA: I hope we are concluding.

21 MR. JONES: We are going to wrap up here  
22 shortly.

23 Q. (By Mr. Jones) So, Mr. Erickson, just  
24 to -- Staff's proposing a floor of 80 percent for  
25 data quality. What are you -- what you are



1 recommending?

2 A. You know, I haven't been involved in the  
3 development of the radar protocols so, and so I'm not  
4 going to probably opine on that. I do know for a lot  
5 of surveys, for example, I think earlier I talked  
6 about the surveys in Foote Creek Rim to look at,  
7 spatial use of the facility for eagles. We could do  
8 surveys once a week in that case. So it varies. It  
9 varies depending on what you're trying to answer.

10 Q. Okay. And as to this -- look at  
11 Condition 24 in the Stipulation. That would be on  
12 page 7.

13 A. Yep.

14 Q. And then now instead of referring to the  
15 Staff Report, you are going to have to refer to Erin  
16 Hazelton's testimony. I don't know if that's up  
17 there or not.

18 A. Should be. Staff Exhibit 3. So is it  
19 loose?

20 MR. SECREST: It is.

21 ALJ WALSTRA: It should be.

22 A. Staff Exhibit 3, look at that. Okay.

23 Q. Okay. And do you have any opinion on the  
24 difference of the standards that are being  
25 recommended by Staff as opposed to Icebreaker on

1 Condition 24?

2 A. Where in -- what will you -- so are you  
3 referring to just the comparison?

4 Q. So, yeah. Begin as to looking at  
5 significant adverse impact and defining that as to  
6 this Stipulation as to biologically significant  
7 impact on population level, blah, blah, blah, blah,  
8 in the parens there, compared to Staff's significant  
9 adverse impact to wild animals.

10 MR. SECREST: I believe it's page 14.

11 Q. 14, I'm sorry. 14 of Ms. Erin Hazelton's  
12 testimony.

13 A. Okay. Could you ask the question again  
14 because I'm comparing the two conditions and then I'm  
15 being referred to those.

16 Q. As to the significant adverse impact and  
17 looking at the impacts, it's defined in the  
18 Stipulation in the parens there, "biologically  
19 significant impact on the population level of any  
20 species or the occurrence of a large mortality event  
21 as defined in the impact mitigation plan" as compared  
22 to Staff's wording of significant adverse impact to  
23 wild animals.

24 A. Which page again on her testimony?

25 Q. On 14.

1           A.    Okay.  And which line?

2           Q.    I'm sorry, that would be line 4.  Do you  
3 have an opinion on that difference?

4           A.    Do I have an opinion?  I would say they  
5 are different, and I would say at least in the  
6 Stipulation that I looked at that it seems to be  
7 focusing more on what seems to be the concern here  
8 which is migrating songbirds so, you know, the -- at  
9 least the second part of that, "occurrence of a large  
10 mortality event as defined in the impact mitigation  
11 plan," so it seems like the concern is you are going  
12 to have mortality events of songbirds, and I think  
13 that to some extent I would say that kind of gets  
14 more at that compared to significant adverse impacts  
15 to wild animals which I don't know what that means.

16          Q.    Okay.  Let me look here.

17          A.    The other -- the difference between the  
18 two conditions is I see there is prescribed  
19 mitigation in the -- in 24.

20          Q.    That's correct.  Staff is proposing that  
21 they be able to prescribe adaptive management in the  
22 situation in which if the plan of Icebreaker fails to  
23 address a significant adverse impact, Staff wouldn't  
24 have the ability then to, in that instance, until  
25 another plan is worked out, be able to prescribe, you

1 know, what course of action should be taken until  
2 another plan is then put in place.

3 Again, that's something the Stipulation  
4 Condition 24 does not have. And I am saying to you  
5 that is a -- that's something that's needed in that  
6 instance to address that impact, significant adverse  
7 impact. Would you oppose that idea?

8 MR. SECREST: Hold on. Move to strike.  
9 Counsel is testifying.

10 MS. LEPPLA: I would second that  
11 objection, your Honor.

12 MR. JONES: I can rephrase.

13 ALJ WALSTRA: Sustained. And he can  
14 rephrase.

15 Q. (By Mr. Jones) You see the language in  
16 Staff Witness Erin Hazelton's testimony on line 9,  
17 Staff is recommending in the language "Temporary  
18 adaptive management may be prescribed until mutually  
19 agreed upon plan is implemented." Do you see that?

20 A. I do. Is that in the condition?

21 Q. That's in Staff's proposed condition as  
22 it's laid out here in her testimony.

23 A. Yep, yep.

24 Q. Okay. And so there's no such language  
25 provided in the Stipulation Condition 19 and so if

1     there's a -- if the plan is not worked out in 24, the  
2     Stipulation 24, then that significant adverse impact  
3     would continue, would it not?

4             A.     I don't know what a significant impact,  
5     adverse impact is in this definition.

6             Q.     All right. Let's say that there's a  
7     significant adverse impact that we agree on, this is  
8     for the hypothetical, okay, say there is something  
9     going on and it's impacting a lot of different bats  
10    or birds, whatever, and it has to be addressed, and  
11    the mitigation plan, under Condition 24, fails.  
12    Wouldn't it be necessary to take immediate action to  
13    address that, in the meantime, until another plan is  
14    put together?

15            A.     That's a hypothetical, and I would say,  
16    you know, based on my experience I've had -- I've had  
17    quite a bit of experience dealing with due diligence  
18    for new wind projects and things like prescribed  
19    mitigation without a sort of a, you know, coordinated  
20    effort. You know, prescribed mitigation, I guess,  
21    without, you know, just sort of loose what that is,  
22    would be something that I guess I haven't seen that  
23    sort of thing in projects I've been involved in so --  
24    and I'm getting tired.

25            Q.     But you're testifying -- I am getting

1 tired too, I think -- that this project presents a  
2 low impact, right? And this Condition 24, do you  
3 understand what it addresses?

4 A. Well, I don't know what a -- how you're  
5 defining a "significant adverse impact" so.

6 Q. So when your plan fails to address a  
7 significant adverse impact --

8 A. I don't know what a significant -- in  
9 this case, I don't know what a significant adverse  
10 impact is, so.

11 MR. JONES: I withdraw that question.  
12 That's all the questions I have.

13 ALJ WALSTRA: Thank you.  
14 Any redirect?

15 MR. SECREST: I have about 45 minutes.

16 ALJ WALSTRA: Yeah. I was just making  
17 sure that you had some.

18 Okay. Then we are -- we will adjourn for  
19 the day.

20 (Thereupon, at 5:32 p.m., the hearing was  
21 adjourned.)

22 - - -  
23  
24  
25

## 1 CERTIFICATE

2 I do hereby certify that the foregoing is  
3 a true and correct transcript of the proceedings  
4 taken by me in this matter on Thursday, September 27,  
5 2018, and carefully compared with my original  
6 stenographic notes.

7  
8  
9 Karen Sue Gibson, Registered  
10 Merit Reporter.

11 Carolyn M. Burke, Registered  
12 Professional Reporter.

13 (KSG-6621)

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Summary: Transcript in the matter of the Icebreaker Windpower, Inc. hearing held on 09/27/18 - Volume IV electronically filed by Mr. Ken Spencer on behalf of Armstrong & Okey, Inc. and Gibson, Karen Sue Mrs.