

In Re:
*SEC 2021-02 - ANTRIM WIND ENERGY FACILITY
SUBCOMMITTEE INVESTIGATION OF COMPLAINTS*

*Public Hearing
June 17, 2021*

*SUSAN J. ROBIDAS, N.H. LCR
30 James Pollock Drive
Manchester, New Hampshire 03102
(603) 540-2083
shortrptr@comcast.net*

1 STATE OF NEW HAMPSHIRE
 2 SITE EVALUATION SUBCOMMITTEE
 3
 4
 5
 6 June 17, 2021 - 1:00 p.m.
 7 N.H. Department of Transportation
 7 Hazen Drive, Concord, NH - Room 114
 8
 9 IN RE: SEC DOCKET NO. 2021-02
 10 ANTRIM WIND ENERGY FACILITY
 11 Subcommittee Investigation of
 12 Complaints
 (Public Hearing)
 13 PRESIDING OFFICER: Jonathan Evans, NH DOT
 14 SUBCOMMITTEE MEMBERS: John Duclos, NH DES
 Thomas Eaton, Public Member
 15
 16
 17 ALSO PRESENT: John-Mark Turner, Esq. (Sheehan...)
 Subcommittee-retained counsel
 18 Michael Haley, Esq. (NH DOJ)
 SEC counsel
 19
 20
 21 COURT REPORTER: Susan J. Robidas, LCR No. 44
 22
 23
 24

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 P R O C E E D I N G S
 2 PRESIDING OFFICER EVANS: All
 3 right. The time is 1:00, so I'd like to get
 4 the meeting started.
 5 All right. Before we begin, just a
 6 few housekeeping items. First we'll do a
 7 roll call. My name is Jon Evans. I'm the
 8 presiding officer for the SEC Subcommittee in
 9 Docket 2021-02.
 10 Start this way.
 11 MR. DUCLOS: My name's John Duclos.
 12 I serve on the Subcommittee as a
 13 representative of the Department of
 14 Environmental Services.
 15 MR. EATON: Tom Eaton, I serve as a
 16 public member to the SEC.
 17 PRESIDING OFFICER EVANS: To my
 18 left.
 19 MR. TURNER: John-Mark Turner,
 20 counsel for the Subcommittee.
 21 MR. HALEY: Michael Haley,
 22 attorney, DOJ. I'm an advisor to the
 23 Subcommittee.
 24 PRESIDING OFFICER EVANS: All

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 I N D E X
 2
 3 PAGE
 4 MOTION: Approval of 4/20/21 5
 and 5/21/21 minutes
 5
 6 SECONDED by Mr. Duclos 5
 7 VOTE TAKEN - Motion passed 6
 8 PUBLIC STATEMENTS BY:
 9 Lori Lerner 10
 10 Mr. Block 24
 11 Ms. Linowes 29
 12 Mr. Needleman 48
 13 Mr. O'Neal 56
 14 Mr. Edwards 78
 15 Mr. Ward 83
 16 Mr. Wilkas 91
 17 Mr. Brooks 98
 18
 19
 20
 21
 22
 23
 24

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 right. Before we begin, also just take note
 2 of the emergency exits. There's one there,
 3 one there and one there. Restrooms are out
 4 that door to either side, on the left or
 5 right.
 6 This meeting is being recorded both
 7 electronically and by a court reporter.
 8 Please speak clearly into the microphone so
 9 that everyone can hear you. Before speaking,
 10 please state your name and, if you wish,
 11 provide any other information you believe to
 12 be relevant, such as your address or
 13 organizational affiliations. If you have a
 14 written version of your comments, please
 15 provide them to the court reporter prior to
 16 leaving to assist in the preparation of the
 17 meeting transcript.
 18 All right. The next item is I do
 19 want to -- we had draft meeting minutes from
 20 both the April 20th and May 21st public
 21 meetings. We did -- we weren't able to
 22 finalize the meetings [sic] from the
 23 April 20th meeting. So with that, I'd like
 24 to finalize the minutes.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 5

1 I know that, Tom, you weren't at
2 the meeting. But John, I didn't know if you
3 had any concerns with finalizing the minutes
4 as they were written.
5 MR. DUCLOS: No, I don't have any
6 issues with those minutes.
7 [Court Reporter interrupts.]
8 MR. DUCLOS: Is this on? Yeah, I
9 have no issues with those minutes, Jon.
10 PRESIDING OFFICER EVANS: Okay.
11 Perfect. Tom.
12 MR. EATON: I'm going to abstain
13 because I was not a member of the Committee
14 at that point.
15 PRESIDING OFFICER EVANS: Okay.
16 Perfect. All right.
17 With that, I'd like to move that
18 the minutes from both of those meetings,
19 April 20th, 2021 and May 21st, 2021, the
20 meeting minutes be adopted.
21 MR. DUCLOS: Second it.
22 PRESIDING OFFICER EVANS: All
23 right. We don't need to do roll call, do we?
24 All right.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 6

1 Jon Evans, I vote yes.
2 MR. DUCLOS: John Duclos, I vote
3 yes.
4 PRESIDING OFFICER EVANS: And Tom.
5 MR. EATON: Tom Eaton, I'll
6 abstain.
7 PRESIDING OFFICER EVANS: All
8 right. With that, the motion is adopted.
9 All right. A few rules of the
10 meeting as we move forward. Each individual
11 who registered to provide public comment in
12 advance of the meeting will be allowed five
13 minutes to speak, followed by an opportunity
14 for the Subcommittee to ask questions of the
15 speaker. The question-and-answer period will
16 not count towards the speaker's five-minute
17 comment period. Public comments shall be
18 limited to discussion -- discussing the
19 Subcommittee's first charge, namely, the
20 appropriate methodologies for measurement and
21 analysis of sound and procedures for
22 validating noise complaints. As the
23 presiding officer, I will enforce the time
24 and discussion limits to ensure a fair,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 7

1 efficient and orderly meeting.
2 Written comments to the
3 Subcommittee's first charge will be accepted
4 for a period of two weeks and must be
5 submitted via the docket distribution list no
6 later than 5 p.m. on July 1st, 2021 for
7 consideration.
8 The Subcommittee did receive a
9 request from Attorney Thomas Getz to register
10 two speakers on behalf of Antrim Wind, as
11 well as we also do need to figure out the
12 order for which we're going to allow the
13 speakers to speak. My recommendation would
14 be to do the order of the speakers
15 alphabetically, just to keep it fair.
16 And then as far as the request from
17 Attorney Thomas Getz to allow two speakers
18 for Antrim Wind, on behalf of Antrim Wind, my
19 feeling is that they're members of the public
20 and we should allow both of those speakers.
21 But I'd like to hear if there's any concerns
22 with that approach for both of those items.
23 MR. DUCLOS: John Duclos. I don't
24 have a problem with having as many speakers

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 8

1 that want to speak as possible for a full
2 accounting of the issues that we have of
3 concern.
4 PRESIDING OFFICER EVANS: With
5 that, so I think -- do we need a roll call
6 or --
7 MR. TURNER: No.
8 PRESIDING OFFICER EVANS: All
9 right. With that, I think we will allow both
10 of the speakers. And I do think what I would
11 like to do then is we'll do them
12 alphabetically. So it does look like we have
13 one question, but --
14 MS. LINOWES: I do, Mr. Chairman.
15 I apologize. My name is Lisa Linowes. If
16 they're representing a single company, are
17 they going to get ten minutes or five minutes
18 total?
19 PRESIDING OFFICER EVANS: Each
20 speaker will get five minutes.
21 MS. LINOWES: So that Antrim Wind
22 will get ten minutes to present.
23 PRESIDING OFFICER EVANS: Again,
24 we're looking at that as two members of the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 9

1 public. There could be multiple members.
2 Anybody could have brought multiple members
3 to the -- and they could have had two
4 separate speakers to get additional time.
5 But that's what we're going to do here today,
6 so we'd like to keep it at that.
7 All right. So alphabetically, the
8 first registered speaker is Richard Block.
9 MR. BLOCK: Can I wait a couple and
10 go a couple -- I'm not quite prepared yet.
11 So if you let one or two people go ahead of
12 me, I'd appreciate that.
13 MR. WARD: Can I suggest that the
14 two people Attorney Getz is bringing in be
15 first, since we have never met any of them,
16 whereas we all pretty much, the rest of us,
17 know what's going on. And if they're
18 going to come in, we don't know much about
19 them, it would be well to let them speak
20 first.
21 PRESIDING OFFICER EVANS: I would
22 prefer not to. Again, I'm trying to keep it
23 as equitable as possible. So I'm going to go
24 alphabetically. I understand Mr. Block has

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 10

1 a -- is working on just getting himself
2 ready, so we'll move to the next one. And
3 then I think after that next speaker, then I
4 would ask to be Mr. Block.
5 Would that be all right with you?
6 MR. BLOCK: I'm somewhat hard of
7 hearing, so I'm not catching everything in
8 the room. I'll do the best I can.
9 PRESIDING OFFICER EVANS: So it
10 would be -- the next one would be Lori
11 Lerner. And then after Lori, yourself.
12 MR. BLOCK: That will work, yes.
13 PRESIDING OFFICER EVANS: All
14 right. I think I'd like to just get started
15 with the actual testimony. So with that,
16 Lori Lerner.
17 (Ms. Lerner distributing handout to
18 Subcommittee members.)
19 MS. LERNER: Good afternoon. Can
20 you hear me okay?
21 PRESIDING OFFICER EVANS: Bring
22 that a little bit closer to you.
23 (Pause in proceedings)
24 MS. LERNER: Can you hear me now?

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 11

1 How's that? I'll do my best.
2 Well, thank you, everybody, for the
3 opportunity to speak here today. My name is
4 Lori Lerner, and I'm a resident at
5 Bridgewater -- in Bridgewater, New Hampshire.
6 And for those of you who I may not have met
7 before, I have been very much involved in
8 this topic since 2012. I was working very
9 closely with the Legislature when we passed
10 Senate Bill 99, Senate Bill 245, and Senate
11 Bill 281.
12 For those of you -- that happened
13 around the 2013 time frame and on. For those
14 of you who may not be familiar with this,
15 it's been a long-going process, where we
16 started with a recognition, recognizing that
17 the Site Evaluation Committee did not have
18 very thorough rules and regulations to
19 provide the public the opportunity to
20 understand what these projects were being
21 judged based on, as well as what the
22 compliance standards were to be once they
23 were implemented or into an operational
24 status.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 12

1 I worked very closely through
2 getting the passing of the legislation. That
3 went on to a whole stakeholder group related
4 to SB 99, which incorporated SB 281. SB 281
5 was specific to industrial wind.
6 We had a stakeholder group process
7 that included meetings across the entire
8 state to get feedback from folks. From there
9 we went into a rulemaking process, where that
10 group was narrowed down into a number of
11 different subject topic areas, and one was
12 very specific to noise emissions related to
13 industrial wind turbines, as well as other
14 energy facilities. I participated in that
15 group. That group was being led by Lisa
16 Linowes. And it incorporated a number of
17 other members of the public, as well as four
18 noise experts. The result of that is the
19 rules that we have before us right now.
20 So we all met, we all agreed, and
21 we brought forward through the rulemaking
22 process, that went through JLCAR, to where we
23 are today, very specific rules.
24 The purpose of the rules in general

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 13

1 were to increase public participation,
 2 provide transparency, to provide certainty to
 3 folks what could be expected when these
 4 facilities were being built. It was
 5 industrial wind. It was transmission. It
 6 went across the board. However, because of
 7 SB 281, we had very specific additional
 8 requirements which must be met for industrial
 9 wind purposes. A big part of that was more
 10 protective siting, as well as compliance
 11 regulations. This is where we come in today.
 12 Antrim Wind was the first
 13 industrial wind facility to go into operation
 14 following the adoption of these rules.
 15 Antrim Wind went into operation on December
 16 24th of 2019, and by December 28th there were
 17 complaints about the noise being created by
 18 this.
 19 I do want to say, and some of you
 20 may have learned, there's a robust record of
 21 evidence regarding all of what will be
 22 discussed today. However, unfortunately,
 23 it's all over the place. So, for those of
 24 you that may not be aware, it's somewhat of a

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 14

1 challenge to find information, as I've been
 2 seeing. Some information is being put within
 3 the new docket, some within the old docket.
 4 Other information is just put in a general
 5 SEC area. So good luck trying to really
 6 understand and get your arms around the full
 7 record of this. But what I'm going to
 8 discuss today is within the record, and it
 9 can be found in various places.
 10 So going back to the rules and the
 11 noise. So the plane language of the SEC rule
 12 regarding noise is very straightforward. It
 13 says, "it shall not exceed." "Shall not
 14 exceed." The only time within the -- so
 15 today what we're here -- this conversation
 16 has been going on basically since the first
 17 complaint. Since some initial review was
 18 done, there was a suggested protocol put
 19 together. Somehow, this noise threshold of
 20 "shall not exceed" has devolved into a
 21 one-hour averaging, which, in the plane
 22 language of the rule -- I provided that in
 23 the first attachment that I gave to you --
 24 you can read for yourself there's nothing

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 15

1 that says there's any one-hour averaging at
 2 all. The standard is very clear. The
 3 standard states, with respect to the sound
 4 standard, the A-weighted equivalent --
 5 [Court Reporter interrupts.]
 6 MS. LERNER: Sound levels produced
 7 by the Applicant's energy facility shall not
 8 exceed the greater of 45 dBA or 5 dBA above
 9 background levels measured at the L90 sound
 10 level between the hours of 8 a.m. and 8 p.m.,
 11 which would be the daytime hours, and the
 12 greater of 40 [sic] dBA and 5 dBA --
 13 PRESIDING OFFICER EVANS: Okay.
 14 Unfortunately, you've hit your five minutes,
 15 so...
 16 MS. LERNER: That's fine. Okay.
 17 PRESIDING OFFICER EVANS: Finish
 18 your one thought there --
 19 MS. LERNER: Sure. So if I could
 20 take you very quickly to the attachment, the
 21 TransAlta attachment, I have put my own
 22 comment in. Hopefully the comments speak for
 23 themselves. But they're identifying that the
 24 rules are not properly defined. Those rules

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 16

1 went through a very extensive process and
 2 also incorporate some of the prior
 3 precedence. To now say that they are not
 4 properly defined is incorrect, and it feels
 5 they're using it to their advantage. Their
 6 one-hour -- the reference to "at least one
 7 nighttime hour," suggesting that that means
 8 they should average over an hour, I have no
 9 idea. What that rule is saying is during the
 10 night, at one point -- at some one-hour time
 11 frame you're to do a noise test. It does not
 12 say anything about averaging.
 13 PRESIDING OFFICER EVANS: Okay.
 14 MS. LERNER: I apologize. That
 15 time went by very fast.
 16 PRESIDING OFFICER EVANS: It's a
 17 tight time. But like I said, we're trying to
 18 keep things moving.
 19 So I guess now the Subcommittee can
 20 ask some questions, if we have any questions.
 21 I know that I kind of do want to know one
 22 question, anyway. The rules do say
 23 "A-weighted equivalent sound." Do you have
 24 any idea what the word "equivalent" means?

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 17

1 MS. LERNER: So A-weighted
2 equivalent -- so there's the A-weighting and
3 a C-weighting, which is identified within the
4 rules. The A-weighting is the ambient, the
5 normal type of noise. And the equivalent, I
6 can't speak to that particular word. But the
7 only equivalent identified in there is the
8 interval for the 1/8th of a second, which is
9 the .125-second interval. So if there's any
10 equivalent in terms of an interval being
11 suggested there, then it would be the 1/8th
12 of a second.

13 PRESIDING OFFICER EVANS: So if you
14 do it at 1/8th of a second, which is the
15 period that also the meter is measuring,
16 taking measurements, how would you -- how
17 would you take out certain -- say there's a
18 -- somebody slams a door or something like
19 that. Do you just disregard that? How --
20 what's the process for that?

21 MS. LERNER: If it's an attended
22 monitoring, those noises should be removed
23 from that.

24 In response to that, as I see, and

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 18

1 as was the expectation with the rules, there
2 was never a discussion about any one-hour
3 averaging during any of our legislative
4 process or rulemaking process. As we all
5 understood this rule to be, it would be as
6 though you're a driver in a car going down
7 Route 93 and you're told that there's a
8 70-mile-an-hour speed limit. You get pulled
9 over for going 100 miles per hour. The
10 officer says, "Excuse me, you've exceeded the
11 speed."

12 Do you think it's reasonable to
13 say, "But if you looked at my speed over the
14 last hour, you will find that I average below
15 70?" No. This is a "shall not exceed."

16 PRESIDING OFFICER EVANS: Would you
17 disagree that the rules say that you need to
18 measure the L90?

19 MS. LERNER: I do not disagree that
20 it says the L90.

21 PRESIDING OFFICER EVANS: L90
22 requires you to remove certain, again,
23 transient noise without -- if you're doing it
24 at 1/8th of a second, how do you do that if

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 19

1 you're measuring 1/8th of a second, and that
2 is your measurement, and L90 is essentially
3 requiring you to take it over a period of
4 time, and the L90 will essentially remove --
5 or the LEQ, I should say -- LEQ or other
6 measurements, if it is an average? You can't
7 do that; correct?

8 MS. LERNER: If you're attending to
9 that and you hear that there's that, you can
10 note that that had occurred during that time.
11 If you're measuring this noise, and there's
12 outside noise to filter out, then it should
13 be the full -- use that 1/8th measurement
14 over the course of whatever period of time.
15 But there's nothing that says to average. So
16 if the sound should go from 40 dBA to 100
17 dBA, or to 60 dBA, there's -- you're going to
18 have peaks and valleys. So the difference
19 between industrial wind and most other
20 sources is that you're going to have peaks
21 and valleys. You've got that "whoop, whoop,
22 whoop." So depending on when you take that
23 is whether you're going to get that actual
24 sound or not. If you average that, you're

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 20

1 averaging the sounds in between the "whoops,"
2 between the actual sound of the wind turbine.
3 You're never going to have a compliance
4 issue, but you're going to have a lot of
5 complaints because people are hearing the
6 "whoop" part of it. They're not hearing the
7 silent part. So if you've got somebody
8 that's attending this noise study, and
9 there's nothing interfering with it, then I
10 don't see why you would need to even be
11 concerned with that.

12 Any other question? Thank you.

13 MR. DUCLOS: You said you were
14 involved in the rulemaking process of this?

15 MS. LERNER: Yes.

16 MR. DUCLOS: Okay. Why didn't they
17 use an Lmax standard?

18 MS. LERNER: An Lmax? So an Lmax
19 is similar to what was used in all of the
20 others. The decision was made to go with
21 something that was more specific, which is
22 why we're using the 1/8th-of-a-second
23 standard within there. That's why the 1/8th
24 of a second, it has its own place in the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 21

1 rule, because that was to be the highlight of
2 this, to give people the knowledge that
3 they're being protected by 1/8th-of-a-second
4 sound study versus Lmax.
5 MR. DUCLOS: Isn't there usually a
6 time standard that's built in, like an Lmax
7 one second or Lmax .8 seconds?
8 MS. LERNER: So this should be
9 interpreted as the Lmax 1/8th second. If you
10 put the time interval which is identified in
11 the rules along with the Lmax, this is what
12 you would get.
13 MR. DUCLOS: Do you see that in the
14 rules someplace as actually stating that?
15 MS. LERNER: I do not see that
16 stated. I see -- what I see stated is the
17 interval for capturing the sound. And the
18 interval to capture the sound is that 1/8th
19 of a second. And from there, the sound shall
20 not exceed at any 1/8th of a second the 40
21 dBA during the nighttime hours and the 40 dBA
22 [sic] during the daytime.
23 MR. DUCLOS: It says shall not
24 exceed the greater of 45 dBA or 5 dBA above

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 22

1 background --
2 [Court Reporter interrupts.]
3 MR. DUCLOS: Or 5 dBA above
4 background noise measured at the L90 sound
5 level between the hours of 8 a.m. and 8 p.m.
6 instead. I don't see a time requirement
7 there at all. It doesn't say anything about,
8 you know, .125 seconds or anything about a
9 time standard. So I'm confused how that
10 could --
11 MS. LERNER: So if you --
12 [Court Reporter interrupts.]
13 MR. DUCLOS: -- how you believe
14 that the standard is set at 1/8th of a
15 second.
16 MS. LERNER: Okay. If you should
17 look to the second page, it would be (e)(6)
18 -- let's see. Second page. "All sound
19 measurements during post-construction
20 monitoring shall be taken at .125-second
21 intervals, measuring both fast response and
22 LEQ metrics."
23 So we're specifically calling
24 out -- that was the intent there, was to call

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 23

1 out 1/8th of a second. And so no sound at
2 1/8th-of-a-second interval should be
3 exceeding the 40 dBA or the 45 dBA. Do you
4 see that on the second page, bracketed in
5 six? So that would be Site 301.18(e)(6).
6 And to that point, as Antrim is arguing, I
7 don't see anywhere where it calls for
8 one-hour averaging. There's nowhere in this
9 rule that specifies one-hour averaging. The
10 only interval identified was .125 seconds.
11 Again, when we look at the intent
12 of all of the work that's gone for the past
13 nine years, we'll call it eight, nine years,
14 it was all to provide more protective
15 measures to these people that live in rural
16 areas that are now going to have this massive
17 energy facility in their back yard.
18 PRESIDING OFFICER EVANS: All
19 right. Tom, did you have any questions or
20 are you all set? You're good? Okay.
21 I think I'd like to move on to the
22 next speaker now.
23 MS. LERNER: Thank you very much
24 for this opportunity.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 24

1 PRESIDING OFFICER EVANS: Thank
2 you.
3 MS. LERNER: I appreciate it.
4 PRESIDING OFFICER EVANS: All
5 right. Mr. Block.
6 MR. BLOCK: Yes. My name is
7 Richard Block. I live on Loveren Mill Road
8 in Antrim, directly across from the wind
9 turbines. For the last how many years it's
10 been, I've served as a spokesperson for many
11 of the people in Antrim who are particularly
12 the non-abutting intervenors. So thank you
13 for this opportunity to speak. I just wanted
14 to make just a few remarks. Where am I
15 starting? Here, okay.
16 I myself am hard of hearing. I
17 have suffered quite a lot of hearing loss.
18 That's due to transient high levels of sound
19 experienced when I was young. It's the one
20 lesson that I wish I could give a lot of
21 young people now. I did -- I worked rock
22 concerts a lot when I was in my teens and
23 twenties. I'm suffering from that now and
24 need to wear hearing aids. It's transient

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 25

1 high-level sound that's dangerous. It can be
2 harmful. I know that personally. And at
3 minimum, it can be very annoying and
4 disruptive.
5 Turbine noise is not steady. If
6 you've ever gone to a wind facility and stood
7 there and listened, you know it's not a
8 steady hum. It's a "whomp, whomp, whoosh,
9 whoosh" sound. There are highs and lows.
10 The turbines in Antrim, I read the blades
11 average 15 revolutions per minute rotation.
12 With three blades, that means that those --
13 what I've also read is that the "whomping"
14 and "whooshing" sound comes when the blades
15 pass in front of the towers. So with three
16 blades, 15 revolutions per minute, that means
17 45 blade passes per minute pass the towers.
18 That simple arithmetic shows that it's about
19 a one and a third seconds apart each one of
20 those intervals. So testing in any form that
21 uses a longer interval than that is going to
22 miss all those transient hums. So it's very
23 important to be able to test in some way that
24 you can hear the variations in there.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 26

1 An example is a shooting range. My
2 son is a firearms instructor, so I know a lot
3 about this. I've been to the range with him
4 many times. If you were to average sound at
5 a shooting range over an hour or two, it's
6 often -- probably would be very low because
7 there are long periods in between shots. The
8 individual shots, though, are the ones that
9 are dangerous. If you do not have very good
10 hearing protection, it's quite a dangerous
11 situation because those transient highs are
12 really very dangerous. I'm not saying that
13 wind turbine highs are that dangerous, but
14 there's definitely a difference between the
15 highs and lows, and that needs to be measured
16 and seen.
17 The human ear does not hear
18 averages. It responds to those transient
19 highs and hears them, and that's what we
20 react to. People who live near wind turbines
21 and hear these noises and "whomps," it's
22 those high levels that interrupt their sleep
23 or whatever they're doing. That's what
24 they're hearing. They're not hearing an

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 27

1 average on an hour. They're hearing -- if
2 I'm trying to talk and there's a loud noise
3 every now and then, that's the part we
4 respond to.
5 I don't think that it takes any
6 sophisticated equipment or technology for a
7 resident to know that turbine sounds nearby
8 might be excessive or disruptive. Either
9 they are or they're not. If the sound is low
10 enough that it doesn't disrupt life, fine.
11 If the sound is high enough that they -- it
12 wakes them up or they can't hear what they're
13 doing in their own house, then it's
14 disruptive.
15 The residents of Antrim and other
16 areas expect protection from noise, not from
17 numbers, okay. The people of Antrim, the
18 residents of Antrim, were promised by the
19 State of New Hampshire via the issuance of
20 the certificate of operation that the
21 residents would not have to endure disruption
22 to their lives from turbine noise. That's
23 what we took away from the certificate. By
24 you granting the certificate, we assumed that

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 28

1 meant that you were going to be watching out
2 for us. I believe that the SEC has always
3 intended to protect residents from disruption
4 of lives by turbines, whether it's the noise
5 or the lighting or whatever. And I think the
6 SEC specifications, the rules and regulations
7 that were set up, were established with that
8 goal in mind. So what I'm urging is that you
9 don't bypass, waive, or change procedures at
10 this point. It's there. It's fairly
11 thoroughly written out. I'm not a technician
12 in terms of sound, but even I can understand
13 when I look at the rules and procedures, I
14 can understand basically how it seems to go.
15 So more importantly, I think it's
16 important not to allow applicants to
17 challenge or ignore established procedures at
18 this point.
19 PRESIDING OFFICER EVANS: Okay.
20 MR. BLOCK: I think what we've got
21 makes sense. Please stick by it. Look out
22 for the people who are living by the
23 turbines.
24 PRESIDING OFFICER EVANS: Okay.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 29

1 Thank you, Mr. Block.
2 MR. BLOCK: Any questions?
3 PRESIDING OFFICER EVANS: I don't
4 think I have any questions.
5 Do you?
6 MR. BLOCK: Thank you for this
7 opportunity.
8 PRESIDING OFFICER EVANS: Okay. We
9 don't have any questions.
10 MR. BLOCK: Thank you again.
11 PRESIDING OFFICER EVANS: Thank
12 you.
13 All right. Next, Lisa Linows
14 [sic]. I hope I pronounced that right.
15 MS. LINOWES: It's Linowes. Thank
16 you, Mr. Chairman. I have some handouts that
17 I'll be referring to.
18 (Ms. Linowes distributing handouts to
19 Subcommittee members.)
20 PRESIDING OFFICER EVANS: All
21 right. Could you, just for the record, just
22 state your name, please.
23 MS. LINOWES: Yes. My name is Lisa
24 Linowes. I'm a resident of the state of New

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 30

1 Hampshire. I am executive director for the
2 Wind Action Group --
3 [Court Reporter interrupts.]
4 MS. LINOWES: I have been around
5 this issue for 14, 15 years, particularly
6 with regard to noise, nationally, and I've
7 been an intervenor in the SEC on all of the
8 wind proceedings.
9 I am not going to read my testimony
10 because I'm going to jump right to the facts.
11 There are three points that I want to make
12 today. One, the SEC has always had a
13 standard. The idea that the SEC --
14 [Court Reporter interrupts.]
15 MS. LINOWES: The idea that the
16 State of New Hampshire does not have a New
17 Hampshire sound standard for turbines is
18 inaccurate. And that seems to be the
19 perception out there. We have had an Lmax
20 standard up through till 2015 when the
21 turbine rules were adopted. I was involved
22 with the stakeholder process. I can tell you
23 why every word is in that standard. And I
24 would hope that you would ask me the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 31

1 questions that you asked Lori Lerner because
2 I'd like to clarify what was going on.
3 Second point I want to make: When
4 the rulemaking went through the process,
5 301.18 was largely the wording that came out
6 of the stakeholder process. It does not
7 change the concept of Lmax significantly. It
8 goes to an LEQ standard with a 1/8th-second
9 interval. That's what it does. And I'll
10 explain how that is when you ask me
11 questions.
12 And finally, I'm going to show you
13 the practical effect of when you go to a
14 one-hour averaging, LEQ one hour, versus an
15 LEQ 1/8th second or an LEQ one second, or one
16 minute. It's significant when you stop to
17 think that the purpose of the SEC rule is to
18 protect public health and safety. We do not
19 want wind turbines elevated -- erected in the
20 state of New Hampshire where it's going to
21 negatively affect or have an unreasonable
22 adverse effect on health and safety. That is
23 the point of the rule. And if I could just
24 comment that, if you look at the first slide,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 32

1 there you can see the four projects that
2 had -- the three projects, rather --
3 Lempster, Groton, Granite Reliable and Antrim
4 Wind. Those all had sound standards. Antrim
5 Wind I. These all predated --
6 [Court Reporter interrupts.]
7 MS. LINOWES: 2012-01. They all
8 had an Lmax standard that was consistent with
9 the state.
10 When you went to the SEC
11 deliberation -- if you looked at Antrim I,
12 2012-01, the Committee spent a considerable
13 amount of time deliberating over whether or
14 not it should trash the Lmax standard to go
15 to an LEQ standard, a long-term average. It
16 opted not to. Why? Two reasons. One, it
17 was concerned about its ability to enforce a
18 long-term average; two, it was concerned that
19 there would be enough quiet times, given the
20 variability of turbine noise, that it would
21 offset the loud times when people were
22 suffering through the loud times. And they
23 didn't want that to happen. So they said it
24 was safer to stick with an Lmax standard.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 33

1 That's why that was done.
2 I want you to turn now to Slide 3.
3 This is the direct effect of an LEQ standard.
4 This is changing when you expand the size of
5 the compliance interval. You each have this
6 slide here. This is from Falmouth,
7 Massachusetts, a 1.65-megawatt turbine. And
8 these were -- this was an on/off test that
9 happened. Turbines on were measured,
10 turbines turned off --
11 [Court Reporter interrupts.]
12 MS. LINOWES: Turbines on and then
13 off. And you can see in that first image,
14 that is a 1/10th-second LEQ. That is
15 effectively what New Hampshire has. Ours now
16 reads a 1/8th second because it was written
17 in 2014. If it were written in 2000 --
18 today, it would have done 1/10th because
19 that's what the meters were -- are today.
20 In any event, you can see that the
21 turbine noise is going up above 45. See
22 that? Then you go to an LEQ one second.
23 It's about the same, but it's flattened. You
24 don't see anything going over 45. You go to

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 34

1 ten seconds, flatter still. You go to one
2 minute, considerably flatter. You go to one
3 hour, it's very quiet. You're meeting
4 compliance with a one-hour LEQ. But people
5 are experiencing the 1/10th-second effect.
6 That is the point of a short interval. If
7 you don't believe my graphs, I would like you
8 to look at Epsilon Associates' co-authored
9 second graph that you're going to see there
10 if you go to this graph.
11 Epsilon Associates is the
12 gentleman, Mr. O'Neal, who's here today.
13 This is from Alma Township in Michigan. I
14 want you to see what happened was Alma
15 Township in Michigan has a -- had an Lmax
16 standard as part of the local ordinance. The
17 company came in and said, oh, Lmax standard,
18 we can't work with that. That doesn't work,
19 right. So they --
20 [Court Reporter interrupts.]
21 MS. LINOWES: They said we want to
22 go to LEQ. That really means LEQ one hour.
23 So what you would look at, if you see the
24 turbines, they're situated in the T and then

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 35

1 a number associated with it --
2 PRESIDING OFFICER EVANS: You got
3 your five minutes.
4 MS. LINOWES: Oh, my God. Come on.
5 There's so -- can I just finish --
6 PRESIDING OFFICER EVANS: You can
7 finish your one thought, yes.
8 MS. LINOWES: The slide shows that
9 when you go to an LEQ one hour, you see the
10 contour is very close to the turbine. When
11 you go out to the 1/8th second or Lmax
12 standard, it goes significantly further.
13 That's the green line. And it's encompassing
14 homes. As a result, you have a project that
15 is not going to meet compliance. It's
16 denied. It's not going to meet the standard.
17 It was denied. They went to court. Lmax
18 standard -- they actually took the town to
19 court over that Lmax standard.
20 Last thing I want to show you is --
21 five minutes is impossible to discuss this
22 point. I do want to show you the last two
23 slides, Antrim Wind. These are LEQ 1/8th
24 second and 1/10th second, actual sound levels

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 36

1 taken at Antrim Wind --
2 [Court Reporter interrupts.]
3 MS. LINOWES: -- taken at Antrim
4 Wind at Location 4.
5 PRESIDING OFFICER EVANS: All
6 right. Thank you.
7 MS. LINOWES: Can I just say that
8 if you did an LEQ one hour on this, the
9 project would be in compliance.
10 PRESIDING OFFICER EVANS: I do have
11 one question. How do you get -- I mean,
12 ultimately you need to figure out if the
13 facility is above a certain level. And if
14 they hit that level, you need to have a
15 single unit. And I get what you're saying
16 about the Lmax. But the unit that we have
17 here is that, one of them that's listed
18 anyway, is the L90. And how do you get that
19 L90 --
20 MS. LINOWES: No, you're
21 misunderstanding what L90 means in this
22 context. L90 in the rule, under
23 post-construction sound monitoring, we asked
24 the developer to provide an L90 because we

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 37

1 want to know what the background noise is for
2 the area generally. L90 is not what's
3 subject to 1/8th second. LEQ is what's
4 subject to 1/8th second. The proper term --
5 and Mr. O'Neal knows this. Mr. O'Neal has
6 read the standard on which our rules are
7 based, 12.9, Part 3. And it says when doing
8 a background sound study, you're generally
9 going to use ten minutes. But that's not
10 LEQ. If you read (e)(6), what does (e)(6)
11 say? Under 301.18, (e)(6) says -- sorry.
12 (e)(6) says all measurements --
13 [Court Reporter interrupts.]
14 MS. LINOWES: Okay. That's a
15 confusion. But that's not intended to
16 reference L90. We're talking about the LEQ
17 with regard to the 1/8th second.
18 PRESIDING OFFICER EVANS: Would you
19 agree that -- well, can you explain what
20 "equivalent" means --
21 MS. LINOWES: Yes.
22 PRESIDING OFFICER EVANS: -- in the
23 rules?
24 MS. LINOWES: Yes. We're talking

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 38

1 about the sound power level that is basically
2 averaged over a period of time. That's what
3 we're talking about. And I agree that
4 (f)14 -- that 301.14 does not specify a time
5 frame. But I will tell you that the time
6 frame is in 301.18. And the reason I know
7 that, and the reason there was no confusion
8 with regard to the rulemaking, if you look on
9 my Slide 4, which is the one that says "SEC
10 Rulemaking," Chairman Honigberger [sic], who
11 was running the process under the rulemaking,
12 stated in the middle column, said -- he was
13 talking about the layout of the rules, okay.
14 And he said I get -- he understood the
15 reliance on NH 301.18 and 301 -- the common
16 -- connection between 301.14 and 301.18 and
17 said this, meaning he was referencing the 14,
18 is where the standard is set, and 18 is where
19 you explain how and where you test. Okay?
20 I know that Antrim Wind is
21 complaining that there's no time frame.
22 They're arguing that the meter speed --
23 somehow we decided 1/8th second -- we're
24 going to specify the meter speed in the rule.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 39

1 We're going to waste our time in a rule
2 defining a meter speed. That's not what
3 we're doing. They may not like the way the
4 rule is written. They may not like the fact
5 that the time interval is in one location but
6 the standard is somewhere else. Fine. I
7 don't take responsibility for that. The rule
8 is written the way the rule is written. But
9 that is the effect of it, that there is no
10 other place in the entire rule where an LEQ
11 time frame is defined.
12 And I get that Lmax should have a
13 time frame. They went to court over the fact
14 that Lmax, in the Almer Township Project,
15 didn't have a time frame associated with it.
16 And the court said, yeah, they really should
17 have put a time frame in there. But they
18 still said Lmax, even without a time frame
19 specified, is a reasonable standard. Anytime
20 you have L, you have to have a time frame
21 associated with it, Lmax, Lmin, LEQ or
22 whatever. You should have a time frame
23 associated with it...(indecipherable).
24 But L90 and L10, those aren't the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 40

1 same things. Those are statistical -- to put
2 so much emphasis on L90, by the way, I just
3 want to make that point, the standard isn't
4 L90. The standard is LEQ. That's what New
5 Hampshire's standard is for noise limit.
6 L90, that's informational information so that
7 the person reading the documentation in the
8 rest of the report could understand what the
9 general acoustical environment was at the
10 time the post-construction sound monitoring
11 was done.
12 One other point. Since you're
13 tasked with figuring out complaint
14 validation, the L90 is not really even
15 relevant. And you'll notice that is not --
16 that's not part of the complaint validation.
17 That is post-construction seasonal
18 monitoring. Different thing.
19 PRESIDING OFFICER EVANS: I'd like
20 to -- do either of the other members have any
21 questions?
22 MR. DUCLOS: I'll just ask a
23 couple. Ms. Linoise?
24 MS. LINOWES: Linowes.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 41

1 MR. DUCLOS: Linowes. Thank you.
2 So one of the areas that you said
3 is that the standard that's in the
4 Certificate of Site and Facility is taken
5 right out of 301.14(f)(2); right?
6 MS. LINOWES: Hmm-hmm. Correct.
7 MR. DUCLOS: And that's determining
8 whether the proposed energy facility will
9 have an unreasonable adverse effect on public
10 health and safety and shall -- and that's
11 where we get into the same thing we said
12 before -- "shall not exceed the greater of 45
13 dBA or 5 dBA background levels."
14 I still don't see a time. The time
15 element you said was in 301.18(e)(6).
16 MS. LINOWES: (e)(6), correct.
17 MR. DUCLOS: That's the sound
18 measurements during post-construction
19 monitoring shall be taken at that
20 1/8th-of-a-second interval, measuring both
21 fast response, which is the fast response,
22 and LEQ metrics.
23 So you also talked a little bit
24 about the Lmax standard. So I'm confused.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 42

1 301.14 was a standard that the SEC used to
2 determine adverse effects. Why didn't they
3 use the term "Lmax" or even put in a LEQ with
4 a time limit or time period --
5 [Court Reporter interrupts.]
6 MR. DUCLOS: With a time period.
7 To be clear, I said "limit," but I'll correct
8 it.
9 MS. LINOWES: I agree. If I were
10 writing this as a technical person, I would
11 have established -- and you would typically
12 see in ordinances that are written around the
13 country, it would have said not to exceed an
14 LEQ -- 45 decibel LEQ and then a time frame
15 associated with it. It could be that the
16 Committee was avoiding that. I don't know.
17 I don't know why they didn't write it that
18 way.
19 We were aware -- the reason -- to
20 your question, and maybe this will help
21 explain, the reason we went to an LEQ
22 standard over an Lmax standard was because
23 back in the 2014-2015 time frame, the wind
24 industry, people like Mr. O'Neal, were out

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 43

1 around the country telling people Lmax made
2 no sense; you cannot do a measurement based
3 on Lmax. And as I mentioned, they went to
4 court and cited in the record --
5 [Court Reporter interrupts.]
6 MS. LINOWES: They went to court
7 over the fact that Lmax -- they argued Lmax
8 didn't make sense. So the State of New
9 Hampshire wanted to avoid that fight. That
10 actual court case actually came after. It
11 was 2016-2017, I believe, when that -- but
12 the point being, yes, you're right. It would
13 be better written if the language had been
14 coincident with the limit, 40 decibel, not to
15 exceed 40 decibel, LEQ 1/8th second. But
16 it's not written that way. And that's fine.
17 But that does not cancel the fact
18 that the only place in the rule where a time
19 frame is specified for LEQ is in 301.18.
20 Chairman Honigberg recognized the connection
21 between 301.14 and 301.18. It is written
22 that way. And right now, Antrim Wind is
23 reaching to try and find a one-hour standard
24 in there somewhere and can't. They're out

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 44

1 pointing to the ANSI standard. The ANSI
2 standard -- do you know the one hour they
3 keep referring to, this basic measuring
4 period? I have the definition. I put the
5 definition -- this second document that I
6 provided for you is a point-counterpoint. I
7 have all of their arguments that they made
8 and why their arguments do not stand up. If
9 I could -- if you would indulge me for a
10 moment --
11 PRESIDING OFFICER EVANS: Well, I
12 think in the interest of time, I think I
13 can -- we'll make sure that these get into
14 the docket, these slides --
15 MS. LINOWES: Okay.
16 PRESIDING OFFICER EVANS: -- and
17 that would all be part of our consideration.
18 MS. LINOWES: Okay. But that basic
19 measuring period is simply the time frame
20 that you're going to go out. You're going to
21 plan to go out and do a measurement. 301,
22 Part 3 -- I'm sorry -- 12.9, Part 3 --
23 [Court Reporter interrupts.]
24 MS. LINOWES: 12.9, Part 3, is a

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 45

1 standard based on an observer present. An
2 observer present. And you're generally not
3 out there more than an hour if you -- you can
4 get your job done in an hour if you pick the
5 right time. And that's what that one hour
6 is. And to try and introduce more meaning to
7 that, like Antrim is trying to do right now,
8 is just they're trying to confuse you. The
9 rule is what matters, not the standard, even
10 though the standard references the rule.
11 This rule is specific.
12 PRESIDING OFFICER EVANS: Thank
13 you.
14 One more follow-up for her? Okay.
15 MR. DUCLOS: I just have a
16 question. Why do you think the 1/8th of a
17 second is a reasonable period?
18 MS. LINOWES: Because it has
19 everything to do with the slide that I just
20 showed you. Let's go to their slide, the
21 Antrim -- the Almer Township slide, because
22 that says it all.
23 MR. DUCLOS: Well, I see it, .125
24 seconds, or 1/8th of a second, you have a lot

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 46

1 of noise. The longer you put a time period
2 in it, the more it flattens out. I agree
3 with that. But why is it reasonable in your
4 mind to do it at an eighth of a second versus
5 one second, ten seconds, a minute an hour?
6 MS. LINOWES: This map shows you.
7 People hear the noise whether -- okay. I'm
8 out there. I'm hearing this noise. This is
9 what I hear. But what I'm -- if I'm Antrim
10 Wind and I'm reporting what I measured to the
11 Site Evaluation Committee to try and prove
12 that I'm compliant with their 45 day, 40 at
13 night, I'm recording something closer to
14 this.
15 So Antrim Wind -- complaints are
16 coming in all over the place from the project
17 at Antrim. And the SEC is sitting there
18 saying they don't know what they're measuring
19 and they're telling me it's in compliance. I
20 don't know what your problem is. The
21 Committee is -- that's what you're trying to
22 figure out right now: Why are there
23 complaints when Antrim Wind is telling you
24 they're in compliance?

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 47

1 By the way, there are other issues.
2 We have raw data right now -- thank you,
3 Antrim Wind, for providing the raw data --
4 that they collected, which was done in
5 1/10th-second intervals. And we're analyzing
6 that right now to see if we're going to find
7 exceedances. We're not going to analyze it
8 based on one-hour averaging. But we'll show
9 you the results of it, one-hour averaging and
10 1/8th seconds, so you can see the difference.
11 We know why. We know that there are
12 exceedances at that project. Did I answer
13 your question?
14 MR. DUCLOS: Good enough for me.
15 MS. LINOWES: Enough for you?
16 MR. DUCLOS: Good enough for me.
17 MS. LINOWES: Oh, okay.
18 PRESIDING OFFICER EVANS: Thank
19 you.
20 Tom?
21 MS. LINOWES: Wind energy is very,
22 very -- it's very, very low noise up to 11
23 decibels, unlike traffic noise, by the way,
24 which one hour is totally fine. A LEQ one

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 48

1 hour is totally fine with traffic noise. It
2 doesn't work for wind turbines.
3 PRESIDING OFFICER EVANS: All
4 right. Thank you.
5 MS. LINOWES: Thanks.
6 PRESIDING OFFICER EVANS: All
7 right. Next, Barry Needleman.
8 (Mr. Getz distributing handouts to
9 Subcommittee members.)
10 PRESIDING OFFICER EVANS: All
11 right. Go head.
12 MR. NEEDLEMAN: Thank you. My name
13 is Barry Needleman, from the law firm of
14 McLane Middleton. I represent Antrim Wind,
15 and I also represent Antrim Wind in the
16 underlying certificate proceeding.
17 What you're being asked to do here
18 today is to move the goal post, essentially,
19 and to declare that 1/8th of a second is the
20 new sound standard, and by doing so,
21 essentially render this facility, and most
22 likely other New Hampshire wind facilities,
23 not in compliance. If this were actually the
24 standard, this project never would have been

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 49

1 built. And that's what you'll hear from Mr.
2 O'Neal shortly. There's nothing in the
3 Antrim Wind decision, there's nothing in the
4 Certificate, there's nothing in the rules or
5 SEC precedent to justify this kind of extreme
6 interpretation of the rule.
7 Mr. Duclos, you've asked several
8 times about Site 301.18 and the
9 1/8th-of-a-second intervals. Those are
10 intervals, not compliance periods. The
11 1/8th-of-a-second interval is meant to be a
12 snapshot to collect data points. And I think
13 I can give you a simple example that
14 demonstrates the fallacy of the different
15 interpretation offered by Ms. Linowes.
16 When you look at the Winter 2020
17 sound report, there were 60 -- over 60
18 million 1/8th-of-a-second intervals included
19 in that sound report by Acentech. If every
20 one of those 1/8th-of-a-second intervals were
21 a compliance period, can you imagine what
22 that would look like? The report would be
23 over a million pages long. As a very
24 practical perspective, it just makes no sense

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 50

1 to interpret the rule that way.
2 Now, it's not lost on me or anybody
3 else that this is complicated stuff. And so
4 let me pull back for a minute and ask you to
5 think for a minute about what the actual
6 experts have said about this.
7 First of all, Acentech prepared
8 that 2020 report. They used the one-hour
9 averaging, and it was their expert opinion
10 that that was what was appropriate. The SEC
11 then hired its own expert to peer-review that
12 work, Mr. Tocci. And what did he say? He
13 concurred with what Acentech did.
14 Antrim Wind also engaged Rob
15 O'Neal, who you'll hear from shortly, and Ken
16 Kalisky of RSP to look at this issue.
17 There's probably no expert that knows more
18 about wind issues in New Hampshire than Mr.
19 O'Neal. He was involved in three of these
20 four dockets as an expert. He testified in
21 Antrim, and he testified in Groton on behalf
22 the Applicants. And he actually
23 peer-reviewed the reports in Lempster for
24 Counsel for the Public.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 51

1 You'll also have a report from Mr.
2 Kalisky here, who was involved in the working
3 group that Ms. Lerner referenced. And when
4 you look at that report, he's going to
5 provide you with a very different description
6 of what happened in that working group from
7 what you heard from Ms. Lerner.
8 In their technical assessments,
9 both Mr. O'Neal's and Mr. Kalisky's, they
10 confirmed what Acentech and what Tocci said,
11 that the way in which these measurements were
12 done was correct and that a 1/8th-second
13 approach to this is not only inconsistent
14 with the rules and the national standards
15 they derived from, it's functionally
16 unworkable.
17 So let me conclude by pointing out,
18 as far as I know, Ms. Linowes apparently has
19 no technical training and no experience with
20 actual sound monitoring. The one expert she
21 did rely on here is Mr. Rand, who produced a
22 report that Mr. O'Neal responded to in his
23 June 7th letter and discussed the fatal flaws
24 with that report.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 52

1 I'm tempted, as I conclude here, to
2 just state the obvious with what's going on.
3 This is an effort to shut this project down.
4 But don't take my word for it. Look at
5 Mr. Rand's report. He wrote it on May 11th.
6 And on Page 12 of the report, he used the
7 incorrect 1/8th-second compliance period. He
8 drew mistaken conclusions about Antrim Wind's
9 supposed exceedances. And then, in his
10 words, he said the only viable way to deal
11 with this was, quote, "shut down." That's
12 the goal here.
13 By contrast, you have in the record
14 four different experts, all of whom have a
15 vast amount of experience with these issues,
16 working for applicants, Counsel for the
17 Public, and the Committee. And every one of
18 these experts says that the 1/8th-of-a-second
19 approach is unworkable, it's internally
20 inconsistent with other aspects of the rules,
21 and it's just simply wrong.
22 Thank you for your time.
23 PRESIDING OFFICER EVANS: Thank
24 you.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 53

1 MS. LINOWES: Mr. Chairman, will
2 there be an opportunity for rebuttal at all?
3 PRESIDING OFFICER EVANS: No.
4 MS. LINOWES: Well, could I comment
5 on something that --
6 PRESIDING OFFICER EVANS: No. I'd
7 like to allow Mr. -- I'd like to give Mr.
8 Needleman the same opportunity that you had.
9 So with that, I think I have the
10 same question that I consistently have been
11 having with what does "equivalent" mean to
12 you.
13 MR. NEEDLEMAN: I would love to
14 tell you. I'm not a sound engineer, and I'm
15 not going to wade into that. I'm sure Mr.
16 O'Neal could tell you all you want to know.
17 MR. DUCLOS: Hello, Mr. Needleman.
18 How are you today?
19 MR. NEEDLEMAN: Good. How are you,
20 Mr. Duclos?
21 MR. DUCLOS: Very good. I agree
22 that the sound study methodology goes on the
23 1/8th of a second, and I agree that that is a
24 standard for collecting data and you're going

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 54

1 to have a lot of data points. The compliance
2 period is different. What's in the
3 Certificate of Site and Facility is also
4 different. But it doesn't say an hour and it
5 doesn't say an eighth of a second is the
6 compliance monitoring standard to meet the
7 45 -- or shall not exceed the greater of 45.
8 So where do you get the hour from as a
9 legitimate compliance measuring period?
10 MR. NEEDLEMAN: Sure. I think
11 you're going to hear from O'Neal on that. I
12 think there are a couple of answers to that
13 question. I think the primary one is that in
14 this context, it's left to professional
15 judgment to determine that period. My
16 understanding is that, to some extent, the
17 one hour does derive from those ANSI
18 standards. But I know, for example, that
19 when Mr. O'Neal did the post-construction
20 sound monitoring for the Groton Wind project,
21 there was a ten-minute compliance interval.
22 So I do know that one hour is not necessarily
23 the only way to do it. Groton did predate
24 the particular rules at issue here, but I'm

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 55

1 not sure that there is a material difference
2 in the context.
3 MR. DUCLOS: And Groton obviously
4 wasn't -- didn't get their Certificate of
5 Site and Facility under this rule. This is
6 the first facility to be issued a certificate
7 under this rule.
8 MR. NEEDLEMAN: Correct.
9 MR. DUCLOS: Okay. I'm just
10 surprised that no time limit was put in
11 there, in all fairness.
12 And I don't have any further
13 questions. Thank you.
14 PRESIDING OFFICER EVANS: Tom, did
15 you have any?
16 MR. EATON: I am all set.
17 To the people, I was appointed last
18 week, and I'm still drinking from the fire
19 hose to catch up.
20 PRESIDING OFFICER EVANS: Well, I
21 am going to continue to just check with you
22 and make sure that you are -- that if you
23 have any questions that pop up, you get them
24 answered.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 56

1 MR. EATON: Thank you.
2 PRESIDING OFFICER EVANS: I think
3 that's all I have for questions.
4 MR. NEEDLEMAN: Thank you for your
5 time.
6 PRESIDING OFFICER EVANS: Thank
7 you.
8 All right. Next, again keeping in
9 alphabetical order, would be Rob O'Neal.
10 MR. O'NEAL: Good afternoon,
11 members of the Subcommittee. My name is Rob
12 O'Neal from Epsilon Associates. I'll try to
13 speak slowly. Thank you for having me to
14 make some remarks today.
15 I've been measuring wind turbine
16 sound for 15-plus years, doing general sound
17 for 34 years. I've measured wind turbine
18 sound here in New Hampshire, as well as other
19 places in the country. I am board-certified
20 by the Institute of Noise Control Engineers.
21 So I just put that out there for background.
22 I'm going to start with my
23 conclusion and go right into the reasons why
24 I can offer this conclusion. The premise

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 57

1 that an operating wind turbine facility can
2 meet an instantaneous 1/8th-of-a-second
3 standard somehow is not true. No wind
4 turbine facility is going to meet that kind
5 of a standard. That's why there are no wind
6 turbine projects built in areas where the
7 jurisdiction that interprets "shall not
8 exceed" does that. So if you interpret that
9 "shall not exceed" as an eighth of a second,
10 there would be no wind farms. There are no
11 wind farms built in those places.
12 Averaging over time makes sense.
13 There's really two fundamental issues with
14 regard to the time element of sound
15 measurements. Number one we've already heard
16 and talked about; that's the speed that the
17 sound meter is set to record the data.
18 That's the one that's set in the SEC rules.
19 The second one is the actual
20 measurement period that's used to assess
21 compliance with whatever the standard is, in
22 this case the 45 day, 40 night LEQ. The SEC
23 rule requires that fast response of .125
24 seconds, that eighth of a second, for

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 58

1 post-construction sound testing. That's the
2 response of the meter. That's how fast it
3 collects the data. And we generally have two
4 settings on our meters we can use, either for
5 fast response of an eighth or a slow
6 response, which is one second. And very
7 often jurisdictions will put that in the
8 rules, that they'd like you to use one or the
9 other. Fast is probably the most commonly
10 used one we see.
11 However, the response speed of the
12 instrument, though, is not the same as the
13 time period used to evaluate compliance with
14 the standard. That's a really important
15 point. Generally you have a sound regulation
16 limit that follows four basic principles.
17 Number one is relevant impact on people.
18 Number two, it should be repeatable; in other
19 words, when we go out and take measurements
20 under similar conditions, we should get
21 similar results. Number three is it should
22 be predictable. You should be able to
23 predict what the sound levels are going to be
24 in the future based on the data we have from

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 59

1 wind turbines. And number four is it should
2 be easy to implement; in other words, we
3 should be able to test without a substantial
4 burden to the public, the regulators or the
5 operator of the wind farm.
6 Using a one-hour time period, for
7 example, checks all four of those boxes.
8 Trying to use a 1/8th-of-a-second time frame
9 as a compliance period does not. I'll give
10 you a quick example. You know, if you think
11 about New Hampshire DOT or FHWA, their noise
12 abatement criteria, or NAC, are one-hour
13 LEQs. They've defined the time period as
14 one-hour LEQ. You know, the NAC for a
15 residential area is 67 decibels. Now, I
16 would suggest that the highway department's
17 not going to say we need to build a sound
18 barrier on this road if the NAC goes over 67
19 for 1/8th of a second and use a more robust
20 time period than that.
21 The second point I wanted to make
22 is about post-construction compliance
23 monitoring. In the rules, it does reference
24 the ANSI S12.9, Part 3 standard which you

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 60

1 heard about. A couple sections in that
2 standard describe the basic data collection
3 procedures which were part of measuring
4 continuous background for at least ten
5 minutes or more -- you've heard that
6 already -- and measurement with a sound in
7 operation for a basic measurement period.
8 Now, the ANSI standard doesn't define what
9 that is. It's left to jurisdictions to pick
10 that out. They use one hour as a typical
11 example. But just to be clear, the ANSI
12 standard doesn't say thou shall/must use one
13 hour. It's an example. And that basic
14 measurement period's broken up into smaller
15 chunks of time in the aggregate to understand
16 what's going on. And those blocks of time
17 can never be less than one second, according
18 to the ANSI standard. So, again, using an
19 eighth of a second would be improper.
20 The third point I want to make is
21 about post-construction compliance monitoring
22 here in New Hampshire. As you know, the
23 rules require in that post-construction
24 evaluation measuring L10 and L90, both

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 61

1 A-weighted and C-weighted. Those are
2 statistical sound levels. I'll be happy to
3 explain them once my five minutes are over if
4 you want. But they're derived, again, from a
5 basic measurement period such as the one-hour
6 example. Trying to calculate a L10 or L90
7 from 1/8th-of-a-second intervals is not
8 possible. That would be like looking at the
9 highest 1/80th of a second for your time
10 period. Just one more quick thought?
11 PRESIDING OFFICER EVANS: Yeah,
12 finish your thought.
13 MR. O'NEAL: Okay. So I'm just
14 going to conclude with the SEC rule is
15 consistent with ANSI standards and other
16 jurisdictions. Exact time period is not
17 specified. Using professional judgment, we
18 would recommend and often use ten-minute or
19 hour periods as the basic measurement period.
20 And that's what has been used here in the SEC
21 compliance evaluation.
22 With that, I'll conclude and take
23 any questions you might have.
24 PRESIDING OFFICER EVANS: My first

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 62

1 question is do the ANSI standards have -- do
2 they list -- and particularly that Part 3
3 standard, is there any mention of an Lmax in
4 there that you're aware of?
5 MR. O'NEAL: Not that I'm aware of,
6 no. And that ANSI standard that we're
7 talking about, this 12.9, Part 3, is really
8 geared toward when an observer is present, in
9 terms of how do you collect the data; what
10 you do for the total sound, which is, you
11 know, your source running plus the
12 background; how do you shut it down; how do
13 you get background only, et cetera. And it
14 goes through all the procedures and --
15 [Court Reporter interrupts.]
16 MR. O'NEAL: All the procedures and
17 the equipment that you would use.
18 PRESIDING OFFICER EVANS: But it
19 does -- the ANSI standard itself does define
20 how you would, say, calculate an L90 or an
21 LEQ or something to that effect; correct?
22 MR. O'NEAL: I don't believe that
23 standard actually tells you how to calculate
24 an L90. And L90 is defined as a statistical

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 63

1 period. So, for example, if you take a
2 measurement for an hour, the L90 is going to
3 be the quietest six minutes. So 6 divided by
4 60 is your quietest 10 percent of the hour.
5 So in other words, the L90 means that 90
6 percent of the time the sound level is higher
7 than whatever your L90 is. So that's not
8 defined in the ANSI standards. It's defined
9 in other standards, in terms of basic
10 terminology.
11 PRESIDING OFFICER EVANS: But does
12 it say -- how do I put this? You know,
13 essentially, how can you even calculate an
14 L10 or an L90 if you're only using a single,
15 essentially a single data point? Is that
16 possible at all? Like 1/8th of a second,
17 which is going to be, if I'm understanding
18 you correctly, it's going to be one data
19 point that you'll get out of that; correct?
20 MR. O'NEAL: Under I think the
21 claim that Ms. Linowes is making, yes, you
22 would have that 1/8th-second data. So trying
23 to calculate an L10 on that 1/8th-second data
24 point is meaningless. You don't do that.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 64

1 You calculate an L10 or an L90 over a broader
2 measuring period, ten minutes, an hour,
3 something like that. Doing it on 1/8th of a
4 second is non-sensical. I've never seen it
5 done.
6 PRESIDING OFFICER EVANS: 'Cause
7 it's essentially just going to be one data
8 point that it will give you. You don't have
9 to do a calculation. There is no
10 calculation; correct?
11 MR. O'NEAL: Correct.
12 PRESIDING OFFICER EVANS: I know
13 you have some good questions.
14 MR. DUCLOS: Well, thank you, Mr.
15 O'Neal, for your testimony. It's nice to get
16 an expert on the other end of the microphone
17 who can explain some of this to me. I think
18 that will be helpful.
19 In the standard, 301.14 (f)(2), it
20 talks about the A-weighted equivalent sound
21 level. What does the "A-weighted" mean?
22 MR. O'NEAL: So A-weighted is just
23 a weighting scale that's defined by standard
24 again. So an A-weighting really

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 65

1 characterizes how we as people respond and
2 how our ears do. In other words, our ears
3 don't hear low frequencies very well, so the
4 A-weighted scale discounts those, if you
5 will. But we hear middle frequencies very
6 well. So the middle frequencies make up a
7 lot of the A-weighted energy. So the
8 A-weighted scale takes all the different
9 octave bands, different frequencies, and
10 weights them according to this A-weighted
11 scale, which, again, is defined by standard
12 and gives you one number. So it gives you
13 that 40 dBA or 45 dBA number that's in the
14 SEC rules.
15 MR. DUCLOS: Okay. And it says
16 "shall not exceed the greater of 45 dBA."
17 What does that mean to you?
18 MR. O'NEAL: So in other words, you
19 have a compliance period, whether it's ten
20 minutes or whether it's an hour. And if I'm
21 measuring sound from a wind turbine for, you
22 know, an entire week, that's 168 hours. So
23 those hours that I know the turbine is really
24 the dominant source of sound, during the day

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 66

1 it can't be over 45 during any of those
2 hours, and at night it can't be over 40.
3 That's what "shall not exceed" means. You
4 can't go over those limits.
5 MR. DUCLOS: Okay. We understand
6 we can't go over those limits. We understand
7 what the A-weighted equivalent means.
8 So, really, in your opinion, is
9 there a compliance period written into this
10 rule?
11 MR. O'NEAL: There is not, and that
12 is probably one of the reasons we're sitting
13 here today is because there is none.
14 If I may go back to the second part
15 of your question. You asked me about an
16 A-weighted equivalent. I only answered the
17 A-weighted part --
18 PRESIDING OFFICER EVANS: I was
19 about to ask that. What does "equivalent"
20 mean to you?
21 MR. O'NEAL: I think that's the
22 question I've heard a few times now, so I
23 want to make sure I give you an answer for
24 that.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 67

1 So equivalent sound is the LEQ.
2 That's the descriptor that you see. And it
3 can be LAEQ, which is an A-weighted
4 equivalent sound level, or LCEQ, which is
5 just a C-weighted equivalent sound level.
6 So equivalent sound level is
7 basically taking all the sound energy over a
8 defined period of time. Again, you got to
9 have some defined period of time. It can be
10 one minute, can be ten minutes, can be
11 whatever, eight hours. But over that time
12 period of time, the sound levels are going to
13 vary somewhat. Any source of sound will have
14 some variation in them. And the equivalent
15 sound level takes all that energy. And
16 thankfully, the sound level meters do this
17 now internally with computer code. You don't
18 have to go back to our calculus textbooks and
19 try to integrate the area under a curve. It
20 takes all that sound energy and gives you an
21 equivalent one number as if that sound was
22 steady the entire time.
23 And the thing about equivalent
24 sound level is it weights the higher sound

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 68

1 levels greater. That's what the LEQ does.
2 And I didn't sit in through the hearings on
3 the rule adoption, but my guess is that's
4 probably why the LEQ was chosen as a metric,
5 because it does weight those higher sound
6 levels. So like a 40 dBA LEQ at night, any
7 higher sound energy from the turbines is
8 going to get counted in that LEQ calculation.
9 It's not discounted. So even though it's --
10 I know I've used the word "average." It's
11 really an integration of energy over the
12 entire time period. But it's a one-number
13 equivalent calculation, if you will, for that
14 time period. Does that make sense?
15 MR. DUCLOS: When the
16 1/8th-of-a-second meters pick up a data
17 point, is there a reason why 1/8th of a
18 second is used versus one second?
19 MR. O'NEAL: I'm just old enough to
20 remember having used the old analog sound
21 level meters when I started my career. And
22 the thinking back in the day was you use a
23 slow response so the needle wouldn't jump
24 around so much. It would slow it down. If

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 69

1 you used a fast response, there's a little
2 bit more wiggle because you're sampling
3 basically eight times a second, if you will,
4 a 1/8th-of-a-second sample rate.
5 So, again, now with digital
6 technology, pretty much the fast response is
7 what we see today for any kind of testing
8 programs.
9 MR. DUCLOS: Let me ask it a
10 different way. How quickly does a human ear
11 pick up sounds?
12 MR. O'NEAL: Again, it all depends
13 on the individual's hearing and how good it
14 is. I don't honestly know if I could tell an
15 eighth of a second, if you get any different
16 gave -- if you get different sounds over a
17 one-second period. I don't think I could
18 tell that. I've never been tested for that
19 kind of refined ability, so I don't have a
20 good answer for you on that one. But I think
21 we'd be hard-pressed to know how sound is
22 changing, you know, unless, of course, it
23 changed dramatically. And when I say
24 dramatically, you know, we're talking a very

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 70

1 large change, 10, 20 decibels over a very
2 short period of time. You know, a decibel or
3 two change, we're not going to really pick
4 that up.
5 MR. DUCLOS: Okay. So the eighth
6 of a second is based on the accuracy of
7 picking up data points because we have the
8 technology to do that now with digital
9 equipment; correct?
10 MR. O'NEAL: Correct. Correct.
11 MR. DUCLOS: So it's kind of a very
12 specific monitor to get as many data points
13 as possible; right?
14 MR. O'NEAL: That's fair, yes.
15 MR. DUCLOS: And to average that
16 for an LEQ, 'cause usually an LEQ has some
17 time period set to it. Is that the way the
18 standard works?
19 MR. O'NEAL: That's the way all the
20 regulations -- well, I shouldn't say all.
21 Most of the sound level regulations that are
22 written try to incorporate a time period in
23 them. Not all of them do. Some of them omit
24 it. Just for whatever reason they omit it.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 71

1 But most of them do a time period, yes.
2 MR. DUCLOS: And you said the LEQ
3 could be LAEQ of T, which would be .125, is
4 unreasonable; it doesn't make any sense
5 whatsoever because the data point then can't
6 be split.
7 MR. O'NEAL: Yes. Correct.
8 MR. DUCLOS: How would that be
9 different than an Lmax standard? Is Lmax
10 just a blip in time, or is it an average type
11 of a standard?
12 MR. O'NEAL: So an Lmax is not that
13 different than the 1/8th-of-a-second
14 measurement. Lmax is going to be what is the
15 highest sound level that you measured, again,
16 over some period of time. You know, the Lmax
17 over one hour might be different than Lmax
18 over an entire day. Could be different hours
19 during the day. But it would be Lmax over a
20 defined period of time, right. Again, it's a
21 very short, instantaneous sound level which,
22 again, goes against some of those four
23 criteria I gave you before, in terms of
24 trying to have a reasonable sound standard,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 72

1 because Lmax is a very -- it can be very
2 variable, whether it's a gust of wind,
3 whether it's a -- you know, any type of
4 source sounds that might intrude that are not
5 necessarily the source that you're trying to
6 measure specifically, that Lmax will pick it
7 up. And it just may obfuscate what you're
8 really trying to measure, which is another
9 reason the L10 and the L90 are very, very
10 useful statistical metrics in wind turbine
11 compliance testing. I've tested dozens and
12 dozens of wind farms post-construction. And
13 if I see the L10 and the LEQ and the L90,
14 those three numbers, I can know right away if
15 that sound is really wind turbine sound or
16 not. They should be very, very close
17 together. They should not be that much
18 different.
19 MR. DUCLOS: All right. So you
20 said the LAEQ .125, in your mind, were
21 equivalent to an Lmax standard, and that's an
22 unreasonable standard for a wind farm.
23 MR. O'NEAL: I'm agreeing with you,
24 yes. The Lmax and the 1/8th-of-a-second LEQ,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 73

1 they can be a little bit different, but
2 they're not wildly different.
3 MR. DUCLOS: And you also agree
4 that the compliance standard that's in the
5 rule and in the certificate don't have a
6 compliance period assigned to the "shall not
7 exceed the greater of 45 dBA."
8 MR. O'NEAL: They did not include a
9 time period in there. Correct.
10 MR. DUCLOS: What is a reasonable
11 time period that they should have considered
12 in the rule, from your wind farm experience?
13 MR. O'NEAL: Sure. I would say a
14 minimum of ten minutes would be the absolute
15 smallest time period that you would consider.
16 We see that a lot in other jurisdictions, ten
17 minutes. A lot of the jurisdictions make you
18 collect multiple ten-minute periods and then
19 take them and do some further calculations
20 with them. Most, or a lot of the
21 jurisdictions that do put a time period in
22 there put in the one-hour.
23 But if you're asking my opinion,
24 I'd say ten minutes would be the absolute

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 74

1 minimum time duration that I would say, based
2 on anything I've measured.
3 MR. DUCLOS: Would you then
4 extrapolate that out to an hourly, say? I
5 mean, I'm coming from the transportation
6 side. That's what we do. I can take
7 measurements at ten minutes or up to 30
8 minutes or whatever, but it gets extrapolated
9 out to an hour. So would you recommend -- is
10 that what you're saying here? Or would it be
11 at, say, an LEQ for ten minutes?
12 MR. O'NEAL: As a practical matter,
13 we're going to have six ten-minute periods
14 because we're going to measure, you know, for
15 many, many days. So you're going to end up
16 with six ten minutes in every hour.
17 And you could do it either way.
18 You could make the ten-minute period itself
19 the compliance period, or you could make them
20 aggregate and take those six ten-minute
21 periods -- because the LEQ, if you have six
22 ten-minute LEQs, for example, you could very
23 easily calculate a one-hour LEQ. The math is
24 very straightforward. It's fine. You can do

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 75

1 that. The beauty of that is, say, for
2 example, you had one of those ten-minute
3 periods contaminated for whatever reason,
4 bunch of trucks went by. You throw that time
5 period out. You could use the other five
6 ten-minute periods and come up with, as you
7 say, an extrapolated one-hour LEQ.
8 In general, the research has
9 shown -- this report came out right after the
10 standards were adopted. But the
11 Massachusetts Clean Energy Center sponsored a
12 wind turbine acoustic study. And the
13 research -- and I was involved in that,
14 actually. And the research showed that, you
15 know, the shorter the time period is, the
16 more unreliable any kind of standard or
17 metric is going to be to try and show
18 compliance with any type of source, wind
19 turbines or something else. They showed in
20 the research that a one-hour standard showed
21 good agreement with pre-construction
22 modeling, which is really what you're trying
23 to get here. You're trying to have somebody
24 who's proposing a project. They know the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 76

1 rules, and they know the rules about how they
2 have to meet the standard. Then having that
3 one-hour time period is going to give them a
4 lot of confidence that if my modeling shows
5 I'm in compliance, I would expect to go out
6 there post-construction and be very confident
7 that it will show compliance.
8 MR. DUCLOS: Thank you. I got a
9 few others, but I can hold them for now.
10 MR. O'NEAL: Okay. I could submit
11 some written comments to sort of expand on
12 this, and you'll have plenty to read.
13 PRESIDING OFFICER EVANS: Sure.
14 That would be helpful. Thank you.
15 MR. O'NEAL: Thank you. Thank you
16 for your time.
17 PRESIDING OFFICER EVANS: All
18 right. Dr. Fred Ward.
19 MR. EDWARDS: Mr. Chairman --
20 PRESIDING OFFICER EVANS: Yes.
21 MR. EDWARDS: Point of order, if I
22 may. I'm not very good with the alphabet.
23 I'm Bob Edwards from the Town of Antrim, and
24 I had an acknowledgment that I could speak.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 77

1 And I'm just not good alphabet, but I
2 believe --
3 PRESIDING OFFICER EVANS: I am
4 sorry if --
5 MR. EDWARDS: No, it's not your
6 fault, because I mistyped your e-mail
7 address. But I did get it from --
8 MR. WARD: I'd be perfectly happy
9 to let E go before W.
10 MR. EDWARDS: And I can't go after
11 Dr. Ward. I don't have the time. I'm only
12 kidding. So if it pleases the Committee --
13 PRESIDING OFFICER EVANS: All
14 right. We just had -- like I said, I
15 didn't -- because it didn't -- the e-mail
16 didn't come to me, so I didn't have you on
17 the list. So with that, we are -- I am
18 trying to wrap this up by 3:00. So with the
19 five-minute periods, no, we should be able to
20 do it. We'll just have to take --
21 MR. EDWARDS: My comments are not
22 technical in nature, so I yield to whatever
23 you want.
24 PRESIDING OFFICER EVANS: Well,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 78

1 since you alphabetically are -- it should
2 have already happened. So by all means, go
3 ahead.
4 MR. EDWARDS: Thank you, Dr. Ward.
5 MR. WARD: You're very welcome.
6 I'll get it back out of you someday.
7 PRESIDING OFFICER EVANS: All
8 right. Since I don't have you on my list, if
9 you could state your name, that would be very
10 helpful.
11 MR. EDWARDS: Yes. My name is Bob
12 Edwards, and I'm one of the selectmen from
13 the Town of Antrim. And I'm not here to
14 define the word "equivalent" or anything
15 close to it. But my -- our comments are
16 general in nature.
17 When we first read the charges for
18 this Subcommittee, the first charge was a bit
19 alarming to us. And I apologize to the
20 Committee if we misunderstood the intent of
21 the language in that. But what we heard and
22 read, and what we heard on the Zoom meetings
23 that you conducted, it seemed to me that you
24 were going outside the scope of what we

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 79

1 thought was going to be included under the
2 first request. And when you started speaking
3 about best procedures in New York and Vermont
4 and so forth, we wanted to just make sure
5 that our interpretation was correct, and that
6 is that you're trying to ensure compliance
7 with the certificate as it relates to
8 measuring and analyzing sound.
9 So the board of selectmen have
10 relied on the SEC expertise when it developed
11 both the operational standards and compliance
12 monitoring procedures, that they were fair
13 and they were equitable to all interested
14 parties, to the Antrim Wind initiative that
15 originated in my time back in 2008, when it
16 all began.
17 And I hope, and I apologize if I
18 am, but I hope I am not oversimplifying this
19 matter. But the Town expected then and
20 continues to expect that the methods utilized
21 to collect and analyze sound data will adhere
22 to the requirements already defined in detail
23 in the terms and methods previously approved
24 and in place as an integral part of Antrim

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 80

1 Wind Energy's certificate. There must be no
2 effort on behalf of the Subcommittee or the
3 full Committee as part of its charge to
4 deviate from or seek alternative
5 methodologies for measurement standards for
6 analysis of sound procedures for this
7 particular wind farm. And should the full
8 Committee feel that such an exercise is
9 justified, we suggest that be a separate and
10 distinct initiative to be undertaken, that
11 may result in future rules standards changes.
12 But it is clearly outside the scope and
13 intent of the Subcommittee's first charge, in
14 our opinion.
15 We at the Town level feel that we
16 are spending too much time unnecessarily with
17 complaints from the public, phone calls at
18 night and so forth regarding violation
19 potentials. And so we also feel that the
20 matter may be -- I don't want oversimplify
21 it, but we just ask that the Committee follow
22 those approvals and guidelines that are
23 already in the certificate.
24 One of the things that I think was

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 81

1 troubling to the Committee was that we --
2 some of the residents didn't allow
3 measurements on their property. And I think
4 our opinion is that if you're going to abide
5 by the initial rules of the SEC when they
6 approved that certificate, it will have a
7 hundred percent cooperation from the
8 landowners. And I understand the waiver is
9 perfectly legitimate, but I'd like to see it
10 done in the same fashion as it was approved.
11 And we asked for their cooperation, as long
12 as we're doing it the way it was approved.
13 So we ask that you let the results
14 be what they are. They will -- either Antrim
15 Wind is compliant or they are not. And if
16 not, we ask that a timely corrective action
17 be undertaken and bring any sound violations
18 compliant with the certificate. If they are
19 found to be compliant after collecting the
20 sound data, and analysis performed in
21 accordance with the certificate requirements,
22 then please let's move forward. Thank you.
23 PRESIDING OFFICER EVANS: Thank
24 you.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 82

1 MR. EDWARDS: Probably no questions
2 for me.
3 PRESIDING OFFICER EVANS: Well, I
4 do have kind of one question. If you -- do
5 you have concerns with the measurement
6 period? Does the Town? 'Cause I mean
7 ultimately it's your agreement that is in the
8 certificate.
9 MR. EDWARDS: Yes.
10 PRESIDING OFFICER EVANS: So do you
11 have concerns with that agreement now at all?
12 MR. EDWARDS: We have concerns,
13 only that we see and hear feedback from
14 people. We don't have the technical
15 knowledge to interpret that properly. And
16 that's one of the prime reasons that we
17 forwarded it on initially and supported the
18 Committee to do the application. But we
19 understand that potentially if it isn't done
20 in the measurements as we understand it to
21 be, then it distorts it, and it can be
22 construed in people's minds as just trying to
23 circumvent the original measurement standards
24 so that it's compliant. But we have no --

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 83

1 we're looking for you and your experts to
2 tell us whether that's in compliance. So I
3 don't know if it's right or wrong. It may be
4 21st Century standards will be such that you
5 redesign the different requirements on it.
6 But what we're trying to suggest is that we
7 spent a lot of time getting the application
8 discussed and approved, and a lot of detail
9 went in and analysis and expert testimony,
10 and we wonder why it isn't a simpler process
11 to merely go in with your experts and say is
12 it being done in accordance with the terms of
13 the certificate, yes or no.
14 PRESIDING OFFICER EVANS: That's
15 what we're trying to figure out.
16 MR. EDWARDS: And we thank you for
17 all you're doing, yeah.
18 MR. DUCLOS: No questions.
19 PRESIDING OFFICER EVANS: All
20 right. Thank you.
21 All right. I think now the next
22 one would be Dr. Fred Ward.
23 MR. WARD: I want to start off with
24 something that I've said to you in writing --

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 84

1 meant to go to you, it went to the old SEC.
2 But this is on point, which you all seem to
3 worry about, which is the question of the
4 averaging interval or no of the sound. Now,
5 you heard all kinds of stories from everybody
6 as to what they might prefer or what these
7 things all mean. And I think you would agree
8 that it's a little bit confusing. Let me
9 just unconfuse it.
10 Neither the human brain nor the
11 human ear averages sound. Let me repeat
12 that. Neither the human brain nor the human
13 ear averages sound. Now, let me give you
14 three examples. It's pretty easy to
15 understand.
16 Let's say that you're somebody
17 who's coming in, they want to put in a rifle
18 range, a pistol range next to a church. Now,
19 you could say that, well, we want the average
20 to be over 40dB. Now, if you're sitting in
21 the church and the rifle range is operating,
22 you go over a 100 dB for a fraction of a
23 second and then it's zero. Maybe another
24 second or ten seconds later you get another

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 85

1 over 100 dB and then zeros. So if you
2 average out all those 100 dBs and zeros, it's
3 around 5 maybe, easily meeting the 40 dB
4 standard, but a total -- a portion of
5 misrepresentation, deliberate, whatever you
6 want to call it of what that 40 dB is
7 supposed to mean. We have the same thing
8 here. We have loud sounds and very little
9 sound, ups and downs.

10 Let me give you this one other
11 example. Supposing you'd like to listen to a
12 classical orchestra or maybe a jazz band.
13 Now, most of these have music that goes up,
14 down and sideways. It gets loud, it gets
15 soft. And most of these orchestras have a
16 drum. Well, the drum sound is a fraction of
17 a second. In between, it cannot beat the
18 damn drum fast enough to put in more than
19 maybe one or two beats in a second or less.
20 So if you average the sound of the drum,
21 there's no drum. The orchestra -- the violin
22 is coasting along and the horns are going
23 along, and the drummer is sitting there ready
24 to beat the damn drum again, kick it,

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 86

1 whatever he's going to do. They're short,
2 sharp things, but you damn well hear them.
3 The average is irrelevant.

4 Let me just make something that you
5 might understand even easier. Let's say
6 we're out on a country road and that country
7 road has cement trucks and great big trucks,
8 but they only go by once, oh, maybe every
9 minute or two minutes or hour, and loud as
10 hell, 100, 150 decibels. The average, what's
11 it going to be? A couple of hundred or 150
12 and a mess of zeros. What does a 40dB
13 average mean over more than a few seconds?
14 What the human ear hears and what the human
15 brain does is meant to be the peaks. It
16 doesn't hear the zeros. It's not set up for
17 that.

18 If you go on a trip, for example,
19 and you go rolling down, you'll see the waves
20 and the things or whatever you want to do.
21 You don't average that out and say, boy, that
22 was a nice average. The average is
23 irrelevant. It has nothing to do with what
24 the human ear is hearing. So all of the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 87

1 discussion about averaging out is what we
2 call in polite language "BS."

3 Now, I have one other point I want
4 to make, and I'm hoping I can get it in. I'm
5 a meteorologist. What you hear from the
6 Antrim Wind facility is totally dependent on
7 the meteorology. The wind speed determines
8 how loud the sound -- how fast things are
9 going and how loud the sound is going to be.
10 Slow-end speeds, low sounds. High-end
11 speeds, high sounds.

12 The second part of meteorology that
13 comes into it is everybody knows, even
14 Mr. O'Neal, that a temperature inversion at
15 night will make an enormous difference. Most
16 of the time, even if it's called an
17 inversion, it implies that there's some other
18 thing, which is the version. Well, that's
19 daytime. In daytime, all the sound goes up
20 and out. Doesn't affect anybody. At night,
21 the ground cools, and it cools the air near
22 the ground. And if you pool the cooler air
23 and it goes up to the level of Antrim Wind,
24 all the sound from the Antrim Wind is trapped

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 88

1 in that. So high winds on the thing, a
2 meteorological phenomenon. And inversion
3 from temperature, another meteorological
4 phenomenon. That's when you get your loud
5 sounds. So talking about anything of these
6 things and talking about, as somebody said,
7 65 million, well, nobody gives a damn about
8 the 65 million. There's only some times.
9 And that's where this should focus: High
10 winds to make louder sound, inversion to trap
11 it. That will always give you the most
12 sound. Thank you.

13 PRESIDING OFFICER EVANS: All
14 right. Thank you. I don't have any
15 questions.

16 Do you, John or Tom?
17 MR. EATON: No.
18 MR. DUCLOS: Dr. Ward, nice to know
19 that you're a meteorologist. That's one
20 thing we didn't bring up is the temperature
21 inversions and how that applies to sound.
22 None of that's in the compliance standard
23 either; right? So wind --
24 MR. WARD: I didn't hear you. None

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 89

1 of that what?
2 MR. DUCLOS: None of that
3 temperature, meteorological information, is
4 in the compliance standard --
5 MR. WARD: Everything
6 meteorological is in every compliance
7 standard because there's only sometimes when
8 the towns are going to be loud. Nobody's
9 sitting here saying that they're always loud.
10 They're loud at certain times. And when you
11 have those things, then you have to make your
12 measurements when the sound levels are the
13 loudest, meteorologically speaking.
14 MR. DUCLOS: Okay. I understand
15 your position.
16 MR. WARD: And that's the reason
17 there are two different standards, day and
18 night, too.
19 MR. DUCLOS: Right. The human ear
20 and the human brain, as you said, picks up,
21 you know, peaks. But we're not dealing with
22 the human ear here or what the brain
23 translates it to. It's what the compliance
24 standard is.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 90

1 MR. WARD: What do you mean we're
2 not here for the human ear? This all has to
3 do with the human ear.
4 MR. DUCLOS: You hear sounds. Do
5 you think of any fan or the wind farm or --
6 MR. WARD: Say it again? Ask me --
7 MR. DUCLOS: Would you think that
8 any fan that you have in your home or the
9 wind farm you wouldn't hear at all, ever?
10 MR. WARD: Oh, you could certainly
11 make enough noise in your house to cover
12 everything. Is that what you're asking?
13 MR. DUCLOS: No. I'm asking
14 whether when they sited this facility here,
15 did you think it would be silent, like a
16 Dyson fan versus an electric-generating wind
17 farm?
18 MR. WARD: Well, most of the time
19 the winds would be -- the sounds from the
20 wind farm would be below, well below 40 dB.
21 Most of the time. The winds are not strong
22 all the time. They're strong some nights,
23 some nights they're not. So maybe some
24 nights you'd hardly know they were there and

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 91

1 then other nights you damn well know it was
2 there.
3 MR. DUCLOS: Okay. No further
4 questions.
5 PRESIDING OFFICER EVANS: All
6 right. Tom, you all set?
7 MR. EATON: All set. Thank you.
8 PRESIDING OFFICER EVANS: All
9 right. The last speaker is Joe Wilkas.
10 MR. WILKAS: I have handouts that
11 I'm going to refer to... I'm not going to --
12 the words I'm going to say are not in there.
13 (Mr. Wilkas distributing handouts to
14 the Subcommittee members.)
15 MR. WILKAS: Thank you for the
16 opportunity to speak to you today. I guess
17 just listening to all the other testimony --
18 PRESIDING OFFICER EVANS: Can you
19 pull the microphone just a little bit closer
20 to you?
21 MR. WILKAS: Okay. Yeah. I had a
22 question. Would Mr. O'Neal choose to live
23 near a wind turbine?
24 PRESIDING OFFICER EVANS: Well, I

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 92

1 don't think -- I don't want to take questions
2 for other people. Questions will come from
3 here.
4 MR. WILKAS: I just brought it up.
5 Okay. We're supposed to be helping
6 with you folks learning sound regulations and
7 things. So what I've done here is I have a
8 list of links and information that are found
9 in those links that are all on the SEC site.
10 The first one is where the sound regulations
11 are, which is Site 301 on the SEC site, which
12 is the regulations. And I've highlighted in
13 little red marks some of the interesting
14 information that I've copied and pasted in
15 here.
16 The first one is for wind energy
17 systems, apply the following standards, and
18 it says that the sound shall not exceed the
19 greater of 45 dBA or 5 dBA above background
20 levels measured at the L90 sound level and --
21 okay. The background -- above background
22 sound levels. 45 dBA or 5 dBA above
23 background levels measured at the L90 sound
24 level between the hours of 8 a.m. and 8 p.m.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 93

1 each day and 40dB or 5 dB above at night.
2 You guys have all heard that. This is where
3 it's easy to find. But again, I'm
4 emphasizing "shall not exceed."
5 Now, the second page is just more
6 of a spec, but nothing highlighted. The
7 third page, all sound measurements during
8 post-construction monitoring shall be taken
9 at 0.125-second intervals, measuring both
10 fast response and LEQ metrics. We've all
11 discussed that, too, but there's the link to
12 finding that information when you want it.
13 The next page, on Page 4, is some
14 information from some of the sound reports
15 that are on your sites. It's including the
16 link to them. This one on Page 4 is the Rand
17 sound report. And included in there is a
18 graph showing, you know, ten minutes of sound
19 collection at the proper sampling rate. And
20 as you can see, much of it above the red line
21 exceeds the limit. And if you averaged that
22 sound level, which people have been proposing
23 to do, then you would not be exceeding the
24 sound levels; you'd be at the sound level.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 94

1 So measuring the peaks not to exceed is the
2 important, significant fact here. And
3 there's a visual indication of it.
4 On Page 5, from another sound
5 report on your site, Tocci's sound report on
6 September 2nd, it says that in this sound
7 report, Column 7 or 8 are measured
8 five-minute, 10th and 90th percent A-weighted
9 sound levels. In other words, the
10 information in this sound level, they're
11 taking five-minute average samples instead of
12 peaks. And that's, again, just for your
13 reference.
14 And there's another statement
15 there, many five-minute samples were noted to
16 be below the 40 dBA after the wind subsided.
17 So once again, they're saying, okay, we're
18 taking five-minute samples, not just -- I
19 mean they're sampling at the proper rate and
20 averaging five minutes, which of course will
21 lower the level that they're recording.
22 And then there's the Acentech
23 post-construction sound report, which I'm
24 highlighting again where they stated the

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 95

1 compliance in this study, the one-hour LEQ
2 metric, as compared to the appropriate
3 daytime and nighttime limits. Once again,
4 we're averaging over an hour, not taking the
5 peaks.
6 And then the final, on Page 6, is a
7 two-minute sample from, actually a posting
8 on our site by Lisa Linowes. And it's
9 showing, once again, that even over two
10 minutes, if you're following the peaks, you
11 can see it exceeding the limit. But if
12 you're averaging, you'd see that you would
13 not be exceeding the limit.
14 PRESIDING OFFICER EVANS: All
15 right. Thank you.
16 MR. DUCLOS: I have no questions.
17 PRESIDING OFFICER EVANS: I think
18 I'll just ask my same question. Do you have
19 any idea what "equivalent" means?
20 MR. DUCLOS: You know, I'm an
21 engineer. And when I get into the acoustics
22 of all this stuff, every time this comes up I
23 have to go looking and researching, and then
24 I finally figure out what I'm looking it. Do

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 96

1 I remember it months later? Not necessarily.
2 I have to go through it again.
3 So you have my thanks for trying to
4 do what you're doing, and my sympathy for
5 trying to do what you're doing, too.
6 PRESIDING OFFICER EVANS: We
7 appreciate that. Thank you.
8 All right. That was -- that's the
9 end of our speakers. And I don't know if
10 anybody on the Committee had any additional
11 items or anything else that either of you two
12 want to discuss. I don't think I have
13 anything.
14 MR. EATON: No.
15 MR. DUCLOS: I'm good.
16 PRESIDING OFFICER EVANS: I forget
17 where we left off when our next meeting will
18 be.
19 MR. TURNER: I think the
20 investigation plan is August, if you want to
21 highlight it.
22 PRESIDING OFFICER EVANS: Yes.
23 Yes, I should do that.
24 So, again, we'll be allowing...

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 97

1 (Discussion off the record among
2 Committee members.)
3 PRESIDING OFFICER EVANS: I don't
4 think we need to rehash that. At least my
5 opinion is that we've done that. We've
6 talked about the ADLS. It was just a --
7 [Court Reporter interrupts.]
8 PRESIDING OFFICER EVANS: I'm
9 sorry. I misinterpreted you. So just go
10 ahead and say it.
11 MR. DUCLOS: I'll just ask.
12 I asked Jon, as the presiding
13 officer, whether he wanted to ask Allen
14 Brooks if he had anything to offer at this
15 public meeting or not, given that -- afford
16 him the opportunity while he's in the
17 audience, as he has represented the Counsel
18 for the Public in a letter on the ADLR
19 system. I would offer him a chance to speak
20 at this public meeting if he so chooses.
21 MR. BROOKS: May I, just very
22 briefly?
23 PRESIDING OFFICER EVANS: Yeah,
24 absolutely.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 98

1 MR. BROOKS: Hi, my name is Allen
2 Brooks. I function as Counsel for the
3 Public. I work at the New Hampshire
4 Department of Justice. Thank you.
5 I have nothing further to add at
6 this time. I'm happy to answer any questions
7 that you have. I would like to consider
8 everything I've heard today, as well as all
9 the written material, and maybe provide my
10 own written comment. I don't want to be
11 disruptive by doing that. I think that
12 you're open to that type of thing happening,
13 but I just want to make sure that that is
14 something that's going to provide some
15 benefit to the Subcommittee and not disrupt
16 whatever process that you have.
17 PRESIDING OFFICER EVANS: Correct.
18 Yeah. Absolutely. If there's any
19 comments -- and again, that's actually what I
20 was just looking up. I just needed to find
21 what I said so I didn't contradict what I
22 said earlier.
23 Any comments that anybody else
24 would like to submit, please just submit them

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 99

1 via the normal docket distribution list.
2 We're just looking for comments by 5 p.m. on
3 July 1st, just so that we can have enough
4 time to get to everything, you know, as we
5 start to make our decisions on the first
6 charge that this Subcommittee has been tasked
7 with.
8 MR. BROOKS: Well, thank you. any
9 questions for me?
10 MR. DUCLOS: I guess we can go to
11 Jon's question.
12 On the standard for measurement,
13 which is 301.14 (f)(2), do you have an
14 opinion what the equivalent sound level is?
15 MR. BROOKS: I've read that
16 standard. The word "equivalent" I'm not sure
17 is going to help you one way or the other to
18 figure out what the standard means. I think
19 you've gone over this very well, which is
20 that your task is to apply that standard.
21 And to do so, you have to figure out how an
22 L90 is going to be applied with the time
23 interval. And in my reading -- I have not
24 gone through this with my office, and I'd

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

Page 100

1 like to. But in my reading so far and
2 listening to it, there is no time interval
3 either stated or implied in the rule. I
4 don't believe it's implied to be 1/8th of a
5 second. I don't believe it's implied to be
6 an hour. It's not stated. So that time
7 interval that's needed is missing from the
8 rule. And the next task would be to figure
9 out what are you going to do to fill in that
10 hole. I think you suspected as much as you
11 were asking some of these questions.
12 MR. DUCLOS: I have no further
13 questions of this person.
14 MR. BROOKS: Thank you.
15 PRESIDING OFFICER EVANS: Thank
16 you, Mr. Brooks.
17 All right. It probably would be
18 helpful for us just to remind everybody of
19 some of the next deadlines.
20 Following the public meeting, the
21 Subcommittee will publish by July 15th a
22 draft recommendation for the appropriate
23 methodologies for measurement and analysis of
24 sound procedures for validating noise

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 complaints. And then the Subcommittee will
2 be accepting written comments, arguments and
3 testimony on the draft recommendation from
4 all parties, which must be filed by
5 July 29th. And then the Committee will hold
6 a public meeting on August 16th to decide
7 whether to adopt the draft recommendation as
8 written or as modified.

9 I will say that we do have to --
10 when we wrote this dispersion of the work
11 plan, we had a different member of our
12 Subcommittee. So I do need to still confirm
13 some of those dates with him, particularly
14 the August 16th, just to make sure that that
15 works into your schedule. So it is possible
16 that that August 16th date may slide a little
17 bit, depending on the schedule of the
18 Subcommittee and whatnot. But that's the
19 rough time frame for likely when our next
20 public meeting would be.

21 So with that, I would like to -- I
22 think we can end the meeting, unless either
23 of you had any other points of discussion.

24 MR. EATON: No.

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 MR. DUCLOS: I'm good.
2 PRESIDING OFFICER EVANS: Okay.
3 All right. With that, thank you everybody
4 for coming today. And we'll keep doing our
5 investigation. Thank you.
6 (WHEREUPON the Public Hearing was
7 adjourned at 2:54 p.m.)
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

1 C E R T I F I C A T E

2
3
4 I, Susan J. Robidas, a Licensed
5 Shorthand Court Reporter and Notary Public
6 of the State of New Hampshire, do hereby
7 certify that the foregoing is a true and
8 accurate transcript of my stenographic
9 notes of these proceedings taken at the
10 place and on the date hereinbefore set
11 forth, to the best of my skill and ability
12 under the conditions present at the time.

13 I further certify that I am neither
14 attorney or counsel for, nor related to or
15 employed by any of the parties to the
16 action; and further, that I am not a
17 relative or employee of any attorney or
18 counsel employed in this case, nor am I
19 financially interested in this action.

20 The foregoing certification of this
21 transcript does not apply to any
22 reproduction of the same by any means
23 unless under the direct control and/or
24 direction of the certifying reporter.

Susan J. Robidas, LCR/RPR
Licensed Shorthand Court Reporter
Registered Professional Reporter
N.H. LCR No. 44 (RSA 310-A:173)

{SEC 2021-02} [PUBLIC HEARING] {06-17-21}

[51:20;57:19 actually (9) 21:14;35:18;43:10; 48:23;50:22;62:23; 75:14;95:7;98:19	75:21;82:7,11 ahead (3) 9:11;78:3;97:10 aids (1) 24:24	32:3,4,11;35:23;36:1, 3;38:20;43:22;45:7,21; 46:9,15,17,23;47:3; 48:14,15;49:3;50:14, 21;52:8;76:23;78:13; 79:14,24;81:14;87:6, 23,24	assess (1) 57:20 assessments (1) 51:8 assigned (1) 73:6 assist (1) 4:16 associated (5) 35:1;39:15,21,23; 42:15 Associates (2) 34:11;56:12 Associates' (1) 34:8 assumed (1) 27:24 attachment (3) 14:23;15:20,21 attended (1) 17:21 attending (2) 19:8;20:8 attorney (4) 3:22;7:9,17;9:14 audience (1) 97:17 August (4) 96:20;101:6,14,16 average (23) 16:8;18:14;19:6,15, 24;25:11;26:4;27:1; 32:15,18;68:10;70:15; 71:10;84:19;85:2,20; 86:3,10,13,21,22,22; 94:11 averaged (2) 38:2;93:21 averages (3) 26:18;84:11,13 averaging (17) 14:21;15:1;16:12; 18:3;20:1;23:8,9; 31:14;47:8,9;50:9; 57:12;84:4;87:1;94:20; 95:4,12 avoid (1) 43:9 avoiding (1) 42:16 aware (4) 13:24;42:19;62:4,5 away (2) 27:23;72:14 A-weighted (16) 15:4;16:23;17:1; 61:1;64:20,21,22;65:4, 7,8,10;66:7,16,17;67:3; 94:8 A-weighting (3) 17:2,4;64:24
[Court (16) 5:7;15:5;22:2,12; 30:3,14;32:6;33:11; 34:20;36:2;37:13;42:5; 43:5;44:23;62:15;97:7 [sic] (5) 4:22;15:12;21:22; 29:14;38:10	add (1) 98:5 additional (3) 9:4;13:7;96:10 address (2) 4:12;77:7 adhere (1) 79:21 adjourned (1) 102:7 ADLR (1) 97:18 ADLS (1) 97:6 adopt (1) 101:7 adopted (4) 5:20;6:8;30:21; 75:10 adoption (2) 13:14;68:3 advance (1) 6:12 advantage (1) 16:5 adverse (3) 31:22;41:9;42:2 advisor (1) 3:22 affect (2) 31:21;87:20 affiliations (1) 4:13 afford (1) 97:15 afternoon (2) 10:19;56:10 Again (27) 8:23;9:22;18:22; 23:11;29:10;56:8; 60:18;61:4;64:24; 65:11;67:8;69:5,12; 71:15,20,22;85:24; 90:6;93:3;94:12,17,24; 95:3,9;96:2,4;98:19 against (1) 71:22 aggregate (2) 60:15;74:20 agree (8) 37:19;38:3;42:9; 46:2;53:21,23;73:3; 84:7 agreed (1) 12:20 agreeing (1) 72:23 agreement (3)	air (2) 87:21,22 alarming (1) 78:19 Allen (2) 97:13;98:1 allow (7) 7:12,17,20;8:9; 28:16;53:7;81:2 allowed (1) 6:12 allowing (1) 96:24 Alma (2) 34:13,14 Almer (2) 39:14;45:21 along (3) 21:11;85:22,23 alphabet (2) 76:22;77:1 alphabetical (1) 56:9 alphabetically (5) 7:15;8:12;9:7,24; 78:1 alternative (1) 80:4 always (4) 28:2;30:12;88:11; 89:9 ambient (1) 17:4 among (1) 97:1 amount (2) 32:13;52:15 analog (1) 68:20 analysis (5) 6:21;80:6;81:20; 83:9;100:23 analyze (2) 47:7;79:21 analyzing (2) 47:5;79:8 annoying (1) 25:3 ANSI (12) 44:1,1;54:17;59:24; 60:8,11,18;61:15;62:1, 6,19;63:8 answered (2) 55:24;66:16 Antrim (42) 7:10,18,18;8:21; 13:12,15;23:6;24:8,11; 25:10;27:15,17,18;	apart (1) 25:19 apologize (4) 8:15;16:14;78:19; 79:17 apparently (1) 51:18 applicants (3) 28:16;50:22;52:16 Applicant's (1) 15:7 application (2) 82:18;83:7 applied (1) 99:22 applies (1) 88:21 apply (2) 92:17;99:20 appointed (1) 55:17 appreciate (3) 9:12;24:3;96:7 approach (3) 7:22;51:13;52:19 appropriate (4) 6:20;50:10;95:2; 100:22 approvals (1) 80:22 approved (5) 79:23;81:6,10,12; 83:8 April (3) 4:20,23;5:19 area (4) 14:5;37:2;59:15; 67:19 areas (5) 12:11;23:16;27:16; 41:2;57:6 argued (1) 43:7 arguing (2) 23:6;38:22 arguments (3) 44:7,8;101:2 arithmetic (1) 25:18 arms (1) 14:6 around (7) 11:13;14:6;30:4; 42:12;43:1;68:24;85:3 aspects (1) 52:20	
A abatement (1) 59:12 abide (1) 81:4 ability (2) 32:17;69:19 able (5) 4:21;25:23;58:22; 59:3;77:19 above (10) 15:8;21:24;22:3; 33:21;36:13;92:19,21, 22;93:1,20 absolute (2) 73:14,24 absolutely (2) 97:24;98:18 abstain (2) 5:12;6:6 accepted (1) 7:3 accepting (1) 101:2 accordance (2) 81:21;83:12 according (2) 60:17;65:10 accounting (1) 8:2 accuracy (1) 70:6 Acentech (5) 49:19;50:7,13;51:10; 94:22 acknowledgment (1) 76:24 acoustic (1) 75:12 acoustical (1) 40:9 acoustics (1) 95:21 across (3) 12:7;13:6;24:8 Action (2) 30:2;81:16 actual (8) 10:15;19:23;20:2; 35:24;43:10;50:5;				

B	<p>blip (1) 71:10</p> <p>Block (14) 9:8,9,24;10:4,6,12; 24:5,6,7;28:20;29:1,2, 6,10</p> <p>blocks (1) 60:16</p> <p>board (2) 13:6;79:9</p> <p>board-certified (1) 56:19</p> <p>Bob (2) 76:23;78:11</p> <p>both (12) 4:6,20;5:18;7:20,22; 8:9;22:21;41:20;51:9; 60:24;79:11;93:9</p> <p>boxes (1) 59:7</p> <p>boy (1) 86:21</p> <p>bracketed (1) 23:4</p> <p>brain (5) 84:10,12;86:15; 89:20,22</p> <p>Bridgewater (2) 11:5,5</p> <p>briefly (1) 97:22</p> <p>Bring (3) 10:21;81:17;88:20</p> <p>bringing (1) 9:14</p> <p>broader (1) 64:1</p> <p>broken (1) 60:14</p> <p>Brooks (8) 97:14,21;98:1,2; 99:8,15;100:14,16</p> <p>brought (3) 9:2;12:21;92:4</p> <p>BS (1) 87:2</p> <p>build (1) 59:17</p> <p>built (5) 13:4;21:6;49:1;57:6, 11</p> <p>bunch (1) 75:4</p> <p>burden (1) 59:4</p> <p>bypass (1) 28:9</p>	<p>calculation (4) 64:9,10;68:8,13</p> <p>calculations (1) 73:19</p> <p>calculus (1) 67:18</p> <p>call (7) 3:7;5:23;8:5;22:24; 23:13;85:6;87:2</p> <p>called (1) 87:16</p> <p>calling (1) 22:23</p> <p>calls (2) 23:7;80:17</p> <p>came (4) 31:5;34:17;43:10; 75:9</p> <p>can (52) 4:9;9:13;10:8,19, 24;14:9,24;16:19;19:9; 25:1,3,24;28:12,14; 30:22;32:1;33:13,20; 35:5,6;36:7;37:19; 44:13;45:3;47:10; 49:13,21;56:24;57:1; 58:4;60:17;63:13; 64:17;67:3,9,10,10; 72:1,14;73:1;74:6,24; 76:9;82:21;87:4;91:18; 93:20;95:11;99:3,10; 101:22</p> <p>cancel (1) 43:17</p> <p>capture (1) 21:18</p> <p>capturing (1) 21:17</p> <p>car (1) 18:6</p> <p>career (1) 68:21</p> <p>case (2) 43:10;57:22</p> <p>catch (1) 55:19</p> <p>catching (1) 10:7</p> <p>Cause (3) 64:6;70:16;82:6</p> <p>cement (1) 86:7</p> <p>Center (1) 75:11</p> <p>Century (1) 83:4</p> <p>certain (4) 17:17;18:22;36:13; 89:10</p> <p>certainly (1) 90:10</p> <p>certainty (1) 13:2</p>	<p>certificate (18) 27:20,23,24;41:4; 48:16;49:4;54:3;55:4, 6;73:5;79:7;80:1,2,3; 81:6,18,21;82:8;83:13</p> <p>cetera (1) 62:13</p> <p>Chairman (6) 8:14;29:16;38:10; 43:20;53:1;76:19</p> <p>challenge (2) 14:1;28:17</p> <p>chance (1) 97:19</p> <p>change (4) 28:9;31:7;70:1,3</p> <p>changed (1) 69:23</p> <p>changes (1) 80:11</p> <p>changing (2) 33:4;69:22</p> <p>characterizes (1) 65:1</p> <p>charge (6) 6:19;7:3;78:18;80:3, 13;99:6</p> <p>charges (1) 78:17</p> <p>check (1) 55:21</p> <p>checks (1) 59:7</p> <p>choose (1) 91:22</p> <p>chooses (1) 97:20</p> <p>chosen (1) 68:4</p> <p>chunks (1) 60:15</p> <p>church (2) 84:18,21</p> <p>circumvent (1) 82:23</p> <p>cited (1) 43:4</p> <p>claim (1) 63:21</p> <p>clarify (1) 31:2</p> <p>classical (1) 85:12</p> <p>Clean (1) 75:11</p> <p>clear (3) 15:2;42:7;60:11</p> <p>clearly (2) 4:8;80:12</p> <p>close (3) 35:10;72:16;78:15</p> <p>closely (2) 11:9;12:1</p>	<p>closer (3) 10:22;46:13;91:19</p> <p>coasting (1) 85:22</p> <p>co-authored (1) 34:8</p> <p>code (1) 67:17</p> <p>coincident (1) 43:14</p> <p>collect (4) 49:12;62:9;73:18; 79:21</p> <p>collected (1) 47:4</p> <p>collecting (2) 53:24;81:19</p> <p>collection (2) 60:2;93:19</p> <p>collects (1) 58:3</p> <p>column (2) 38:12;94:7</p> <p>coming (4) 46:16;74:5;84:17; 102:4</p> <p>comment (6) 6:11,17;15:22;31:24; 53:4;98:10</p> <p>comments (11) 4:14;6:17;7:2;15:22; 76:11;77:21;78:15; 98:19,23;99:2;101:2</p> <p>Committee (17) 5:13;11:17;32:12; 42:16;46:11,21;52:17; 77:12;78:20;80:3,8,21; 81:1;82:18;96:10;97:2; 101:5</p> <p>common (1) 38:15</p> <p>commonly (1) 58:9</p> <p>company (2) 8:16;34:17</p> <p>compared (1) 95:2</p> <p>complaining (1) 38:21</p> <p>complaint (3) 14:17;40:13,16</p> <p>complaints (7) 6:22;13:17;20:5; 46:15,23;80:17;101:1</p> <p>compliance (40) 11:22;13:10;20:3; 33:5;34:4;35:15;36:9; 46:19,24;48:23;49:10, 21;52:7;54:1,6,9,21; 57:21;58:13;59:9,22; 60:21;61:21;65:19; 66:9;72:11;73:4,6; 74:19;75:18;76:5,7;</p>
	C			
<p>blade (1) 25:17</p> <p>blades (4) 25:10,12,14,16</p>	<p>calculate (7) 61:6;62:20,23;63:13, 23;64:1;74:23</p>			

79:6,11;83:2;88:22; 89:4,6,23;95:1	construed (1) 82:22	17:3	60:8;62:19;78:14	51:5;52:14;54:2,4; 65:8,9;69:10,15,16; 71:9,13,17,18;72:18; 73:1,2;83:5;89:17; 101:11
compliant (5) 46:12;81:15,18,19; 82:24	contaminated (1) 75:3	D	defined (13) 15:24;16:4;39:11; 59:13;62:24;63:8,8; 64:23;65:11;67:8,9; 71:20;79:22	digital (2) 69:5;70:8
complicated (1) 50:3	context (3) 36:22;54:14;55:2	damn (5) 85:18,24;86:2;88:7; 91:1	defining (1) 39:2	direct (1) 33:3
computer (1) 67:17	continue (1) 55:21	dangerous (5) 25:1;26:9,10,12,13	definitely (1) 26:14	directly (1) 24:8
concept (1) 31:7	continues (1) 79:20	data (21) 47:2,3;49:12;53:24; 54:1;57:17;58:3,24; 60:2;62:9;63:15,18,22, 23;64:7;68:16;70:7,12; 71:5;79:21;81:20	definition (2) 44:4,5	director (1) 30:1
concern (1) 8:3	contour (1) 35:10	date (1) 101:16	deliberate (1) 85:5	disagree (2) 18:17,19
concerned (3) 20:11;32:17,18	contradict (1) 98:21	dates (1) 101:13	deliberating (1) 32:13	discounted (1) 68:9
concerns (5) 5:3;7:21;82:5,11,12	contrast (1) 52:13	day (8) 46:12;57:22;65:24; 68:22;71:18,19;89:17; 93:1	deliberation (1) 32:11	discounts (1) 65:4
concerts (1) 24:22	Control (1) 56:20	daytime (5) 15:11;21:22;87:19, 19;95:3	demonstrates (1) 49:14	discuss (3) 14:8;35:21;96:12
conclude (4) 51:17;52:1;61:14,22	conversation (1) 14:15	dB (6) 84:22;85:1,3,6; 90:20;93:1	denied (2) 35:16,17	discussed (4) 13:22;51:23;83:8; 93:11
conclusion (2) 56:23,24	cooler (1) 87:22	days (1) 74:15	Department (2) 3:13;98:4	discussing (1) 6:18
conclusions (1) 52:8	cools (2) 87:21,21	daytime (5) 15:11;21:22;87:19, 19;95:3	department's (1) 59:16	discussion (6) 6:18,24;18:2;87:1; 97:1;101:23
concurring (1) 50:13	cooperation (2) 81:7,11	dBs (1) 85:2	dependent (1) 87:6	dispersion (1) 101:10
conditions (1) 58:20	copied (1) 92:14	deal (1) 52:10	depending (2) 19:22;101:17	disregard (1) 17:19
conducted (1) 78:23	corrective (1) 81:16	dealing (1) 89:21	depends (1) 69:12	disrupt (2) 27:10;98:15
confidence (1) 76:4	correctly (1) 63:18	December (2) 13:15,16	derive (1) 54:17	disruption (2) 27:21;28:3
confident (1) 76:6	counsel (5) 3:20;50:24;52:16; 97:17;98:2	decibel (4) 42:14;43:14,15;70:2	derived (2) 51:15;61:4	disruptive (4) 25:4;27:8,14;98:11
confirm (1) 101:12	count (1) 6:16	decibels (4) 47:23;59:15;70:1; 86:10	describe (1) 60:2	distinct (1) 80:10
confirmed (1) 51:10	counted (1) 68:8	decide (1) 101:6	description (1) 51:5	distorts (1) 82:21
confuse (1) 45:8	country (5) 42:13;43:1;56:19; 86:6,6	decided (1) 38:23	descriptor (1) 67:2	distributing (4) 10:17;29:18;48:8; 91:13
confused (2) 22:9;41:24	couple (6) 9:9,10;40:23;54:12; 60:1;86:11	decision (2) 20:20;49:3	detail (2) 79:22;83:8	distribution (2) 7:5;99:1
confusing (1) 84:8	course (3) 19:14;69:22;94:20	decisions (1) 99:5	determine (2) 42:2;54:15	divided (1) 63:3
confusion (2) 37:15;38:7	court (9) 4:7,15;35:17,19; 39:13,16;43:4,6,10	declare (1) 48:19	determines (1) 87:7	docket (6) 3:9;7:5;14:3,3; 44:14;99:1
connection (2) 38:16;43:20	cover (1) 90:11	define (3)	determining (1) 41:7	dockets (1) 50:20
consider (2) 73:15;98:7	created (1) 13:17		developed (1) 79:10	document (1) 44:5
considerable (1) 32:12	criteria (2) 59:12;71:23		developer (1) 36:24	documentation (1) 40:7
considerably (1) 34:2	curve (1) 67:19		deviate (1) 80:4	DOJ (1) 3:22
consideration (2) 7:7;44:17	C-weighted (2) 61:1;67:5		devolved (1) 14:20	dominant (1) 65:24
considered (1) 73:11	C-weighting (1)		difference (5) 19:18;26:14;47:10; 55:1;87:15	
consistent (2) 32:8;61:15			different (22) 12:11;40:18;49:14;	
consistently (1) 53:10				

<p>done (13) 14:18;33:1,18;40:11; 45:4;47:4;51:12;64:5; 81:10;82:19;83:12; 92:7;97:5</p> <p>door (2) 4:4;17:18</p> <p>DOT (1) 59:11</p> <p>down (8) 12:10;18:6;52:3,11; 62:12;68:24;85:14; 86:19</p> <p>downs (1) 85:9</p> <p>dozens (2) 72:11,12</p> <p>Dr (5) 76:18;77:11;78:4; 83:22;88:18</p> <p>draft (4) 4:19;100:22;101:3,7</p> <p>dramatically (2) 69:23,24</p> <p>drew (1) 52:8</p> <p>drinking (1) 55:18</p> <p>driver (1) 18:6</p> <p>drum (6) 85:16,16,18,20,21,24</p> <p>drummer (1) 85:23</p> <p>DUCLOS (62) 3:11,11;5:5,8,21;6:2, 2;7:23,23;20:13,16; 21:5,13,23;22:3,13; 40:22;41:1,7,17;42:6; 45:15,23;47:14,16; 49:7;53:17,20,21;55:3, 9;64:14;65:15;66:5; 68:15;69:9;70:5,11,15; 71:2,8;72:19;73:3,10; 74:3;76:8;83:18;88:18; 89:2,14,19;90:4,7,13; 91:3;95:16,20;96:15; 97:11;99:10;100:12; 102:1</p> <p>due (1) 24:18</p> <p>duration (1) 74:1</p> <p>during (11) 16:9;18:3;19:10; 21:21,22;22:19;41:18; 65:24;66:1;71:19;93:7</p> <p>Dyson (1) 90:16</p>	<p>22:17;37:10,10,11, 12;41:16</p> <p>ear (10) 26:17;69:10;84:11, 13;86:14,24;89:19,22; 90:2,3</p> <p>earlier (1) 98:22</p> <p>ears (2) 65:2,2</p> <p>easier (1) 86:5</p> <p>easily (2) 74:23;85:3</p> <p>easy (3) 59:2;84:14;93:3</p> <p>EATON (11) 3:15,15;5:12;6:5,5; 55:16;56:1;88:17;91:7; 96:14;101:24</p> <p>EDWARDS (13) 76:19,21,23;77:5,10, 21;78:4,11,12;82:1,9, 12;83:16</p> <p>effect (7) 31:13,22;33:3;34:5; 39:9;41:9;62:21</p> <p>effectively (1) 33:15</p> <p>effects (1) 42:2</p> <p>efficient (1) 7:1</p> <p>effort (2) 52:3;80:2</p> <p>eight (3) 23:13;67:11;69:3</p> <p>eighth (8) 46:4;54:5;57:9,24; 58:5;60:19;69:15;70:5</p> <p>either (10) 4:4;27:8;40:20;58:4; 74:17;81:14;88:23; 96:11;100:3;101:22</p> <p>electric-generating (1) 90:16</p> <p>electronically (1) 4:7</p> <p>element (2) 41:15;57:14</p> <p>elevated (1) 31:19</p> <p>else (5) 39:6;50:3;75:19; 96:11;98:23</p> <p>e-mail (2) 77:6,15</p> <p>emergency (1) 4:2</p> <p>emissions (1) 12:12</p> <p>emphasis (1) 40:2</p>	<p>emphasizing (1) 93:4</p> <p>encompassing (1) 35:13</p> <p>end (4) 64:16;74:15;96:9; 101:22</p> <p>endure (1) 27:21</p> <p>energy (13) 12:14;15:7;23:17; 41:8;47:21;65:7;67:7, 15,20;68:7,11;75:11; 92:16</p> <p>Energy's (1) 80:1</p> <p>enforce (2) 6:23;32:17</p> <p>engaged (1) 50:14</p> <p>engineer (2) 53:14;95:21</p> <p>Engineers (1) 56:20</p> <p>enormous (1) 87:15</p> <p>enough (10) 27:10,11;32:19; 47:14,15,16;68:19; 85:18;90:11;99:3</p> <p>ensure (2) 6:24;79:6</p> <p>entire (6) 12:7;39:10;65:22; 67:22;68:12;71:18</p> <p>environment (1) 40:9</p> <p>Environmental (1) 3:14</p> <p>Epsilon (3) 34:8,11;56:12</p> <p>equipment (3) 27:6;62:17;70:9</p> <p>equitable (2) 9:23;79:13</p> <p>equivalent (26) 15:4;16:23,24;17:2, 5,7,10;37:20;53:11; 64:20;66:7,16,19;67:1, 4,5,6,14,21,23;68:13; 72:21;78:14;95:19; 99:14,16</p> <p>erected (1) 31:19</p> <p>essentially (7) 19:2,4;48:18,21; 63:13,15;64:7</p> <p>established (3) 28:7,17;42:11</p> <p>et (1) 62:13</p> <p>evaluate (1) 58:13</p>	<p>Evaluation (4) 11:17;46:11;60:24; 61:21</p> <p>EVANS (90) 3:2,7,17,24;5:10,15, 22;6:1,4,7;8:4,8,19,23; 9:21;10:9,13,21;15:13, 17;16:13,16;17:13; 18:16,21;23:18;24:1,4; 28:19,24;29:3,8,11,20; 35:2,6;36:5,10;37:18, 22;40:19;44:11,16; 45:12;47:18;48:3,6,10; 52:23;53:3,6;55:14,20; 56:2,6;61:11,24;62:18; 63:11;64:6,12;66:18; 76:13,17,20;77:3,13, 24;78:7;81:23;82:3,10; 83:14,19;88:13;91:5,8, 18,24;95:14,17;96:6, 16,22;97:3,8,23;98:17; 100:15;102:2</p> <p>even (12) 20:10;28:12;39:18; 40:14;42:3;45:9;63:13; 68:9;86:5;87:13,16; 95:9</p> <p>event (1) 33:20</p> <p>everybody (5) 11:2;84:5;87:13; 100:18;102:3</p> <p>everyone (1) 4:9</p> <p>evidence (1) 13:21</p> <p>Exact (1) 61:16</p> <p>example (13) 26:1;49:13;54:18; 59:7,10;60:11,13;61:6; 63:1;74:22;75:2;85:11; 86:18</p> <p>examples (1) 84:14</p> <p>exceed (19) 14:13,14,20;15:8; 18:15;21:20,24;41:12; 42:13;43:15;54:7;57:8, 9;65:16;66:3;73:7; 92:18;93:4;94:1</p> <p>exceedances (3) 47:7,12;52:9</p> <p>exceeded (1) 18:10</p> <p>exceeding (4) 23:3;93:23;95:11,13</p> <p>exceeds (1) 93:21</p> <p>excessive (1) 27:8</p> <p>Excuse (1) 18:10</p>	<p>executive (1) 30:1</p> <p>exercise (1) 80:8</p> <p>exits (1) 4:2</p> <p>expand (2) 33:4;76:11</p> <p>expect (3) 27:16;76:5;79:20</p> <p>expectation (1) 18:1</p> <p>expected (2) 13:3;79:19</p> <p>experience (3) 51:19;52:15;73:12</p> <p>experienced (1) 24:19</p> <p>experiencing (1) 34:5</p> <p>expert (7) 50:9,11,17,20;51:20; 64:16;83:9</p> <p>expertise (1) 79:10</p> <p>experts (6) 12:18;50:6;52:14,18; 83:1,11</p> <p>explain (6) 31:10;37:19;38:19; 42:21;61:3;64:17</p> <p>extensive (1) 16:1</p> <p>extent (1) 54:16</p> <p>extrapolate (1) 74:4</p> <p>extrapolated (2) 74:8;75:7</p> <p>extreme (1) 49:5</p>
F				
<p>E</p>				
<p>e6 (6)</p>				
			<p>f14 (1) 38:4</p> <p>f2 (2) 64:19;99:13</p> <p>facilities (3) 12:14;13:4;48:22</p> <p>facility (15) 13:13;15:7;23:17; 25:6;36:13;41:4,8; 48:21;54:3;55:5,6; 57:1,4;87:6;90:14</p> <p>fact (5) 39:4,13;43:7,17;94:2</p> <p>facts (1) 30:10</p> <p>fair (4) 6:24;7:15;70:14; 79:12</p> <p>fairly (1)</p>	

28:10 fairness (1) 55:11 fallacy (1) 49:14 Falmouth (1) 33:6 familiar (1) 11:14 fan (3) 90:5,8,16 far (3) 7:16;51:18;100:1 farm (8) 59:5;72:22;73:12; 80:7;90:5,9,17,20 farms (3) 57:10,11;72:12 fashion (1) 81:10 fast (13) 16:15;22:21;41:21, 21;57:23;58:2,5,9; 69:1,6;85:18;87:8; 93:10 fatal (1) 51:23 fault (1) 77:6 feedback (2) 12:8;82:13 feel (3) 80:8,15,19 feeling (1) 7:19 feels (1) 16:4 few (6) 3:6;6:9;24:14;66:22; 76:9;86:13 FHWA (1) 59:11 fight (1) 43:9 figure (8) 7:11;36:12;46:22; 83:15;95:24;99:18,21; 100:8 figuring (1) 40:13 filed (1) 101:4 fill (1) 100:9 filter (1) 19:12 final (1) 95:6 finalize (2) 4:22,24 finalizing (1) 5:3 finally (2)	31:12;95:24 find (6) 14:1;18:14;43:23; 47:6;93:3;98:20 finding (1) 93:12 fine (7) 15:16;27:10;39:6; 43:16;47:24;48:1; 74:24 Finish (4) 15:17;35:5,7;61:12 fire (1) 55:18 firearms (1) 26:2 firm (1) 48:13 First (21) 3:6;6:19;7:3;9:8,15, 20;13:12;14:16,23; 31:24;33:13;50:7;55:6; 61:24;78:17,18;79:2; 80:13;92:10,16;99:5 five (9) 6:12;8:17,20;15:14; 35:3,21;61:3;75:5; 94:20 five-minute (6) 6:16;77:19;94:8,11, 15,18 flattened (1) 33:23 flattens (1) 46:2 flatter (2) 34:1,2 flaws (1) 51:23 focus (1) 88:9 folks (3) 12:8;13:3;92:6 follow (1) 80:21 followed (1) 6:13 following (4) 13:14;92:17;95:10; 100:20 follows (1) 58:16 follow-up (1) 45:14 forget (1) 96:16 form (1) 25:20 forth (2) 79:4;80:18 forward (3) 6:10;12:21;81:22 forwarded (1)	82:17 found (3) 14:9;81:19;92:8 four (8) 12:17;32:1;50:20; 52:14;58:16;59:1,7; 71:22 fraction (2) 84:22;85:16 frame (18) 11:13;16:11;38:5,6, 21;39:11,13,15,17,18, 20,22;42:14,23;43:19; 44:19;59:8;101:19 Fred (2) 76:18;83:22 frequencies (4) 65:3,5,6,9 front (1) 25:15 full (5) 8:1;14:6;19:13;80:3, 7 function (1) 98:2 functionally (1) 51:15 fundamental (1) 57:13 further (6) 35:12;55:12;73:19; 91:3;98:5;100:12 future (2) 58:24;80:11	85:13;87:19,23 Good (17) 10:19;14:5;23:20; 26:9;47:14,16;53:19, 21;56:10;64:13;69:13, 20;75:21;76:22;77:1; 96:15;102:1 Granite (1) 32:3 granting (1) 27:24 graph (3) 34:9,10;93:18 graphs (1) 34:7 great (1) 86:7 greater (9) 15:8,12;21:24;41:12; 54:7;65:16;68:1;73:7; 92:19 green (1) 35:13 Groton (5) 32:3;50:21;54:20,23; 55:3 ground (2) 87:21,22 group (8) 12:3,6,10,15,15; 30:2;51:3,6 guess (4) 16:19;68:3;91:16; 99:10 guidelines (1) 80:22 gust (1) 72:2 guys (1) 93:2	98:12 happy (3) 61:2;77:8;98:6 hard (2) 10:6;24:16 hardly (1) 90:24 hard-pressed (1) 69:21 harmful (1) 25:2 head (1) 48:11 health (3) 31:18,22;41:10 hear (23) 4:9;7:21;10:20,24; 19:9;25:24;26:17,21; 27:12;46:7,9;49:1; 50:15;54:11;65:3,5; 82:13;86:2,16;87:5; 88:24;90:4,9 heard (10) 51:7;57:15;60:1,5; 66:22;78:21,22;84:5; 93:2;98:8 hearing (14) 10:7;20:5,6;24:16, 17,24;26:10,24,24; 27:1;46:8;69:13;86:24; 102:6 hearings (1) 68:2 hears (2) 26:19;86:14 hell (1) 86:10 Hello (1) 53:17 help (2) 42:20;99:17 helpful (4) 64:18;76:14;78:10; 100:18 helping (1) 92:5 Hi (1) 98:1 high (6) 24:18;26:22;27:11; 87:11;88:1,9 High-end (1) 87:10 higher (4) 63:6;67:24;68:5,7 highest (2) 61:9;71:15 high-level (1) 25:1 highlight (2) 21:1;96:21 highlighted (2) 92:12;93:6	
G			H		
		gave (3) 14:23;69:16;71:23 geared (1) 62:8 general (6) 12:24;14:4;40:9; 56:16;75:8;78:16 generally (5) 37:2,8;45:2;58:3,15 gentleman (1) 34:12 gets (3) 74:8;85:14,14 Getz (4) 7:9,17;9:14;48:8 given (2) 32:19;97:15 gives (4) 65:12,12;67:20;88:7 goal (3) 28:8;48:18;52:12 God (1) 35:4 goes (9) 31:8;35:12;53:22; 59:18;62:14;71:22;			

<p>highlighting (1) 94:24</p> <p>highs (5) 25:9;26:11,13,15,19</p> <p>highway (1) 59:16</p> <p>himself (1) 10:1</p> <p>hired (1) 50:11</p> <p>hit (2) 15:14;36:14</p> <p>Hmm-hmm (1) 41:6</p> <p>hold (2) 76:9;101:5</p> <p>hole (1) 100:10</p> <p>home (1) 90:8</p> <p>homes (1) 35:14</p> <p>honestly (1) 69:14</p> <p>Honigberg (1) 43:20</p> <p>Honigberger (1) 38:10</p> <p>hope (4) 29:14;30:24;79:17,18</p> <p>Hopefully (1) 15:22</p> <p>hoping (1) 87:4</p> <p>horns (1) 85:22</p> <p>hose (1) 55:19</p> <p>hour (35) 16:7,8;18:9,14;26:5;27:1,31;14:34;3,22;35:9;36:8;44:2;45:3,4,5;46:5;47:24;48:1;54:4,8,17,22;60:10,13;61:19;63:2,4;64:2;65:20;71:17;74:9,16;86:9;95:4;100:6</p> <p>hourly (1) 74:4</p> <p>hours (10) 15:10,11;21:21;22:5;65:22,23;66:2;67:11;71:18;92:24</p> <p>house (2) 27:13;90:11</p> <p>housekeeping (1) 3:6</p> <p>How's (1) 11:1</p> <p>hum (1) 25:8</p> <p>human (14)</p>	<p>26:17;69:10;84:10,11,12,12;86:14,14,24;89:19,20,22;90:2,3</p> <p>hums (1) 25:22</p> <p>hundred (2) 81:7;86:11</p> <p style="text-align: center;">I</p> <p>idea (5) 16:9,24;30:13,15;95:19</p> <p>identified (4) 17:3,7;21:10;23:10</p> <p>identifying (1) 15:23</p> <p>ignore (1) 28:17</p> <p>image (1) 33:13</p> <p>imagine (1) 49:21</p> <p>impact (1) 58:17</p> <p>implement (1) 59:2</p> <p>implemented (1) 11:23</p> <p>implied (3) 100:3,4,5</p> <p>implies (1) 87:17</p> <p>important (4) 25:23;28:16;58:14;94:2</p> <p>importantly (1) 28:15</p> <p>impossible (1) 35:21</p> <p>improper (1) 60:19</p> <p>inaccurate (1) 30:18</p> <p>include (1) 73:8</p> <p>included (4) 12:7;49:18;79:1;93:17</p> <p>including (1) 93:15</p> <p>inconsistent (2) 51:13;52:20</p> <p>incorporate (2) 16:2;70:22</p> <p>incorporated (2) 12:4,16</p> <p>incorrect (2) 16:4;52:7</p> <p>increase (1) 13:1</p> <p>indication (1) 94:3</p>	<p>individual (2) 6:10;26:8</p> <p>individual's (1) 69:13</p> <p>indulge (1) 44:9</p> <p>industrial (6) 12:5,13;13:5,8,13;19:19</p> <p>industry (1) 42:24</p> <p>information (11) 4:11;14:1,2,4;40:6;89:3;92:8,14;93:12,14;94:10</p> <p>informational (1) 40:6</p> <p>initial (2) 14:17;81:5</p> <p>initially (1) 82:17</p> <p>initiative (2) 79:14;80:10</p> <p>instantaneous (2) 57:2;71:21</p> <p>instead (2) 22:6;94:11</p> <p>Institute (1) 56:20</p> <p>instructor (1) 26:2</p> <p>instrument (1) 58:12</p> <p>integral (1) 79:24</p> <p>integrate (1) 67:19</p> <p>integration (1) 68:11</p> <p>intended (2) 28:3;37:15</p> <p>intent (4) 22:24;23:11;78:20;80:13</p> <p>interest (1) 44:12</p> <p>interested (1) 79:13</p> <p>interesting (1) 92:13</p> <p>interfering (1) 20:9</p> <p>internally (2) 52:19;67:17</p> <p>interpret (3) 50:1;57:8;82:15</p> <p>interpretation (3) 49:6,15;79:5</p> <p>interpreted (1) 21:9</p> <p>interprets (1) 57:7</p> <p>interrupt (1)</p>	<p>26:22</p> <p>interrupts] (16) 5:7;15:5;22:2,12;30:3,14;32:6;33:11;34:20;36:2;37:13;42:5;43:5;44:23;62:15;97:7</p> <p>interval (20) 17:8,9,10;21:10,17,18;23:2,10;25:21;31:9;33:5;34:6;39:5;41:20;49:11;54:21;84:4;99:23;100:2,7</p> <p>intervals (9) 22:21;25:20;47:5;49:9,10,18,20;61:7;93:9</p> <p>intervenor (1) 30:7</p> <p>intervenor (1) 24:12</p> <p>into (16) 4:8;11:23;12:9,10;13:13,15;14:20;41:11;44:13;53:15;56:23;60:14;66:9;87:13;95:21;101:15</p> <p>introduce (1) 45:6</p> <p>intrude (1) 72:4</p> <p>inversion (4) 87:14,17;88:2,10</p> <p>inversions (1) 88:21</p> <p>investigation (2) 96:20;102:5</p> <p>involved (6) 11:7;20:14;30:21;50:19;51:2;75:13</p> <p>irrelevant (2) 86:3,23</p> <p>issuance (1) 27:19</p> <p>issue (4) 20:4;30:5;50:16;54:24</p> <p>issued (1) 55:6</p> <p>issues (7) 5:6,9;8:2;47:1;50:18;52:15;57:13</p> <p>item (1) 4:18</p> <p>items (3) 3:6;7:22;96:11</p> <p>it indecipherable (1) 39:23</p> <p style="text-align: center;">J</p> <p>jazz (1) 85:12</p> <p>JLCAR (1)</p>	<p>12:22</p> <p>job (1) 45:4</p> <p>Joe (1) 91:9</p> <p>John (5) 3:11;5:2;6:2;7:23;88:16</p> <p>John-Mark (1) 3:19</p> <p>Jon (4) 3:7;5:9;6:1;97:12</p> <p>Jon's (1) 99:11</p> <p>judged (1) 11:21</p> <p>judgment (2) 54:15;61:17</p> <p>July (4) 7:6;99:3;100:21;101:5</p> <p>jump (2) 30:10;68:23</p> <p>June (1) 51:23</p> <p>jurisdiction (1) 57:7</p> <p>jurisdictions (6) 58:7;60:9;61:16;73:16,17,21</p> <p>Justice (1) 98:4</p> <p>justified (1) 80:9</p> <p>justify (1) 49:5</p> <p style="text-align: center;">K</p> <p>Kalisky (2) 50:16;51:2</p> <p>Kalisky's (1) 51:9</p> <p>keep (6) 7:15;9:6,22;16:18;44:3;102:4</p> <p>keeping (1) 56:8</p> <p>Ken (1) 50:15</p> <p>kick (1) 85:24</p> <p>kidding (1) 77:12</p> <p>kind (8) 16:21;49:5;57:4;69:7,19;70:11;75:16;82:4</p> <p>kinds (1) 84:5</p> <p>knowledge (2) 21:2;82:15</p> <p>knows (3)</p>
--	--	---	--	--

37:5;50:17;87:13	14,15,15;32:15;33:3, 14,22;34:4,22,22;35:9, 23;36:8;37:3,10,16; 39:10,21;40:4;41:22; 42:3,14,14,21;43:15, 19;47:24;57:22;59:14; 62:21;67:1;68:1,4,6,8; 70:16,16;71:2;72:13, 24;74:11,21,23;75:7; 93:10;95:1	30:4,15;32:7;33:12; 34:21;35:4,8;36:3,7, 20;37:14,21,24;40:24, 24;41:1,6,16;42:9; 43:6;44:15,18,24; 45:18;46:6;47:15,17, 21;48:5;49:15;51:18; 53:1,4;63:21;95:8	looked (2) 18:13;32:11	45:9
L			looking (7) 8:24;61:8;83:1; 95:23,24;98:20;99:2	May (17) 4:20;5:19;11:6,14; 13:20,24;39:3,4;52:5; 66:14;72:7;76:22; 80:11,20;83:3;97:21; 101:16
L10 (8) 39:24;60:24;61:6; 63:14,23;64:1;72:9,13	42:3,14,14,21;43:15, 19;47:24;57:22;59:14; 62:21;67:1;68:1,4,6,8; 70:16,16;71:2;72:13, 24;74:11,21,23;75:7; 93:10;95:1	Linows (1) 29:13	Lori (5) 10:10,11,16;11:4; 31:1	maybe (8) 42:20;84:23;85:3,12, 19;86:8;90:23;98:9
L90 (34) 15:9;18:18,20,21; 19:2,4;22:4;36:18,19, 21,22,24;37:2,16; 39:24;40:2,4,6,14; 60:24;61:6;62:20,24, 24;63:2,5,7,14;64:1; 72:9,13;92:20,23; 99:22	LEQs (2) 59:13;74:22	Lisa (5) 8:15;12:15;29:13,23; 95:8	loss (1) 24:17	McLane (1) 48:14
LAEQ (3) 67:3;71:3;72:20	Lerner (25) 10:11,16,17,19,24; 11:4;15:6,16,19;16:14; 17:1,21;18:19;19:8; 20:15,18;21:8,15; 22:11,16;23:23;24:3; 31:1;51:3,7	list (6) 7:5;62:2;77:17;78:8; 92:8;99:1	lost (1) 50:2	mean (12) 36:11;53:11;64:21; 65:17;66:20;74:5;82:6; 84:7;85:7;86:13;90:1; 94:19
landowners (1) 81:8	less (2) 60:17;85:19	listed (1) 36:17	lot (14) 20:4;24:17,20,22; 26:2;45:24;54:1;65:7; 73:16,17,20;76:4;83:7, 8	meaning (2) 38:17;45:6
language (5) 14:11,22;43:13; 78:21;87:2	lesson (1) 24:20	listen (1) 85:11	loud (12) 27:2;32:21,22;85:8, 14;86:9;87:8,9;88:4; 89:8,9,10	meaningless (1) 63:24
large (1) 70:1	letter (2) 51:23;97:18	listened (1) 25:7	louder (1) 88:10	means (13) 16:7,24;25:12,16; 34:22;36:21;37:20; 63:5;66:3,7;78:2; 95:19;99:18
largely (1) 31:5	level (26) 15:10;22:5;36:13,14; 38:1;63:6;64:21;67:4, 5,6,15,16,24;68:21; 70:21;71:15,21;80:15; 87:23;92:20,24;93:22, 24;94:10,21;99:14	listening (2) 91:17;100:2	loudest (1) 89:13	meant (4) 28:1;49:11;84:1; 86:15
last (6) 18:14;24:9;35:20,22; 55:17;91:9	levels (17) 15:6,9;24:18;26:22; 35:24;41:13;58:23; 61:2;67:12;68:1,6; 89:12;92:20,22,23; 93:24;94:9	little (9) 10:22;41:23;69:1; 73:1;84:8;85:8;91:19; 92:13;101:16	love (1) 53:13	measure (4) 18:18;72:6,8;74:14
later (3) 7:6;84:24;96:1	life (1) 27:10	live (4) 23:15;24:7;26:20; 91:22	Loveren (1) 24:7	measured (11) 15:9;22:4;26:15; 33:9;46:10;56:17; 71:15;74:2;92:20,23; 94:7
law (1) 48:13	lighting (1) 28:5	lives (2) 27:22;28:4	low (5) 26:6;27:9;47:22; 65:3;87:10	measurement (18) 6:20;19:2,13;43:2; 44:21;57:20;60:6,7,14; 61:5,19;63:2;71:14; 80:5;82:5,23;99:12; 100:23
layout (1) 38:13	likely (2) 48:22;101:19	living (1) 28:22	lower (1) 94:21	measures (13) 17:16;19:6;22:19; 37:12;41:18;51:11; 57:15;58:19;74:7;81:3; 82:20;89:12;93:7
LCEQ (1) 67:4	limit (10) 18:8;40:5;42:4,7; 43:14;55:10;58:16; 93:21;95:11,13	Lmax (42) 20:17,18,18;21:4,6,7, 9,11;30:19;31:7;32:8, 14,24;34:15,17;35:11, 17,19;36:16;39:12,14, 18,21;41:24;42:3,22; 43:1,3,7,7;62:3;71:9,9, 12,14,16,17,19;72:1,6, 21,24	lows (2) 25:9;26:15	measures (1) 23:15
learned (1) 13:20	limited (1) 6:18	Lmin (1) 39:21	luck (1) 14:5	measuring (17) 17:15;19:1,11;22:21; 41:20;44:3,19;46:18; 54:9;56:15;60:3,24; 64:2;65:21;79:8;93:9; 94:1
learning (1) 92:6	limits (4) 6:24;66:4,6;95:3	local (1) 34:16	lucky (1) 14:5	meets (6) 35:15,16;54:6;57:2, 4;76:2
least (3) 16:6;60:4;97:4	line (2) 35:13;93:20	Location (2) 36:4;39:5	map (1) 46:6	meeting (19) 3:4;4:6,17,19,23;5:2, 20;6:10,12;7:1;34:3; 85:3;96:17;97:15,20; 100:20;101:6,20,22
leaving (1) 4:16	link (2) 93:11,16	long (3) 26:7;49:23;81:11	marks (3) 28:21;49:24;57:12	meets (1) 23:15
led (1) 12:15	links (2) 92:8,9	longer (2) 25:21;46:1	making (1) 63:21	meets (1) 23:15
left (5) 3:18;4:4;54:14;60:9; 96:17	Linoise (1) 40:23	long-going (1) 11:15	many (8) 7:24;24:9,10;26:4; 70:12;74:15,15;94:15	meets (1) 23:15
legislation (1) 12:2	LINOWES (44) 8:14,15,21;12:16; 29:15,15,18,23,24;	long-term (2) 32:15,18	material (2) 55:1;98:9	meets (1) 23:15
legislative (1) 18:3		look (14) 8:12;22:17;23:11; 28:13,21;31:24;34:8, 23;38:8;49:16,22; 50:16;51:4;52:4	math (1) 74:23	meets (1) 23:15
Legislature (1) 11:9			matter (3) 74:12;79:19;80:20	meets (1) 23:15
legitimate (2) 54:9;81:9			matters (1) 74:12;79:19;80:20	meets (1) 23:15
Lempster (2) 32:3;50:23				
LEQ (50) 19:5,5;22:22;31:8,				

<p>meetings (5) 4:21,22;5:18;12:7; 78:22</p> <p>member (3) 3:16;5:13;101:11</p> <p>members (12) 7:19;8:24;9:1,2; 10:18;12:17;29:19; 40:20;48:9;56:11; 91:14;97:2</p> <p>mention (1) 62:3</p> <p>mentioned (1) 43:3</p> <p>merely (1) 83:11</p> <p>mess (1) 86:12</p> <p>met (4) 9:15;11:6;12:20; 13:8</p> <p>meteorological (4) 88:2,3;89:3,6</p> <p>meteorologically (1) 89:13</p> <p>meteorologist (2) 87:5;88:19</p> <p>meteorology (2) 87:7,12</p> <p>meter (6) 17:15;38:22,24;39:2; 57:17;58:2</p> <p>meters (5) 33:19;58:4;67:16; 68:16,21</p> <p>methodologies (3) 6:20;80:5;100:23</p> <p>methodology (1) 53:22</p> <p>methods (2) 79:20,23</p> <p>metric (3) 68:4;75:17;95:2</p> <p>metrics (4) 22:22;41:22;72:10; 93:10</p> <p>Michael (1) 3:21</p> <p>Michigan (2) 34:13,15</p> <p>microphone (3) 4:8;64:16;91:19</p> <p>middle (3) 38:12;65:5,6</p> <p>Middleton (1) 48:14</p> <p>might (6) 27:8;61:23;71:17; 72:4;84:6;86:5</p> <p>miles (1) 18:9</p> <p>Mill (1) 24:7</p>	<p>million (4) 49:18,23;88:7,8</p> <p>mind (3) 28:8;46:4;72:20</p> <p>minds (1) 82:22</p> <p>minimum (3) 25:3;73:14;74:1</p> <p>minute (10) 25:11,16,17;31:16; 34:2;46:5;50:4,5; 67:10;86:9</p> <p>minutes (33) 4:19,24;5:3,6,9,18, 20;6:13;8:17,17,20,22; 15:14;35:3,21;37:9; 60:5;61:3;63:3;64:2; 65:20;67:10;73:14,17, 24;74:7,8,11,16;86:9; 93:18;94:20;95:10</p> <p>misinterpreted (1) 97:9</p> <p>misrepresentation (1) 85:5</p> <p>miss (1) 25:22</p> <p>missing (1) 100:7</p> <p>mistaken (1) 52:8</p> <p>mistyped (1) 77:6</p> <p>misunderstanding (1) 36:21</p> <p>misunderstood (1) 78:20</p> <p>modeling (2) 75:22;76:4</p> <p>modified (1) 101:8</p> <p>moment (1) 44:10</p> <p>monitor (1) 70:12</p> <p>monitoring (13) 17:22;22:20;36:23; 40:10,18;41:19;51:20; 54:6,20;59:23;60:21; 79:12;93:8</p> <p>months (1) 96:1</p> <p>more (17) 13:9;20:21;23:14; 28:15;45:3,6,14;46:2; 50:17;59:19;60:5; 61:10;69:2;75:16; 85:18;86:13;93:5</p> <p>most (12) 19:19;48:21;58:9; 70:21;71:1;73:20; 85:13,15;87:15;88:11; 90:18,21</p> <p>motion (1)</p>	<p>6:8</p> <p>move (6) 5:17;6:10;10:2; 23:21;48:18;81:22</p> <p>moving (1) 16:18</p> <p>much (11) 9:16,18;11:7;23:23; 40:2;68:24;69:6;72:17; 80:16;93:20;100:10</p> <p>multiple (3) 9:1,2;73:18</p> <p>music (1) 85:13</p> <p>must (4) 7:4;13:8;80:1;101:4</p> <p>myself (1) 24:16</p>	<p>11:5;14:3;27:19; 29:24;30:16,16;31:20; 33:15;40:4;43:8;48:20, 22;50:18;56:18;59:11; 60:22;79:3;98:3</p> <p>next (15) 4:18;10:2,3,10; 23:22;29:13;48:7;56:8; 83:21;84:18;93:13; 96:17;100:8,19;101:19</p> <p>NH (1) 38:15</p> <p>nice (3) 64:15;86:22;88:18</p> <p>night (10) 16:10;46:13;57:22; 66:2;68:6;80:18;87:15, 20;89:18;93:1</p> <p>nights (4) 90:22,23,24;91:1</p> <p>nighttime (3) 16:7;21:21;95:3</p> <p>nine (2) 23:13,13</p> <p>nobody (1) 88:7</p> <p>Nobody's (1) 89:8</p> <p>noise (34) 6:22;12:12,18;13:17; 14:11,12,19;16:11; 17:5;18:23;19:11,12; 20:8;22:4;25:5;27:2, 16,22;28:4;30:6;32:20; 33:21;37:1;40:5;46:1, 7,8;47:22,23;48:1; 56:20;59:11;90:11; 100:24</p> <p>noises (2) 17:22;26:21</p> <p>non-abutting (1) 24:12</p> <p>none (4) 66:13;88:22,24;89:2</p> <p>non-sensical (1) 64:4</p> <p>nor (2) 84:10,12</p> <p>normal (2) 17:5;99:1</p> <p>note (2) 4:1;19:10</p> <p>noted (1) 94:15</p> <p>notice (1) 40:15</p> <p>nowhere (1) 23:8</p> <p>number (11) 12:10,16;35:1;57:15; 58:17,18,21;59:1; 65:12,13;67:21</p> <p>numbers (2)</p>	<p>27:17;72:14</p>
O				
		N		
		<p>NAC (3) 59:12,14,18</p> <p>name (12) 3:7;4:10;8:15;11:3; 24:6;29:22,23;48:12; 56:11;78:9,11;98:1</p> <p>namely (1) 6:19</p> <p>name's (1) 3:11</p> <p>narrowed (1) 12:10</p> <p>national (1) 51:14</p> <p>nationally (1) 30:6</p> <p>nature (2) 77:22;78:16</p> <p>near (3) 26:20;87:21;91:23</p> <p>nearby (1) 27:7</p> <p>necessarily (3) 54:22;72:5;96:1</p> <p>need (11) 5:23;7:11;8:5;18:17; 20:10;24:24;36:12,14; 59:17;97:4;101:12</p> <p>needed (2) 98:20;100:7</p> <p>needle (1) 68:23</p> <p>Needleman (10) 48:7,12,13;53:8,13, 17,19;54:10;55:8;56:4</p> <p>needs (1) 26:15</p> <p>negatively (1) 31:21</p> <p>Neither (2) 84:10,12</p> <p>New (18)</p>	<p>obfuscate (1) 72:7</p> <p>observer (3) 45:1,2;62:8</p> <p>obvious (1) 52:2</p> <p>obviously (1) 55:3</p> <p>occurred (1) 19:10</p> <p>octave (1) 65:9</p> <p>off (5) 33:10,13;83:23; 96:17;97:1</p> <p>offer (3) 56:24;97:14,19</p> <p>offered (1) 49:15</p> <p>office (1) 99:24</p> <p>OFFICER (92) 3:2,8,17,24;5:10,15, 22;6:4,7,23;8:4,8,19, 23;9:21;10:9,13,21; 15:13,17;16:13,16; 17:13;18:10,16,21; 23:18;24:1,4;28:19,24; 29:3,8,11,20;35:2,6; 36:5,10;37:18,22; 40:19;44:11,16;45:12; 47:18;48:3,6,10;52:23; 53:3,6;55:14,20;56:2, 6;61:11,24;62:18; 63:11;64:6,12;66:18; 76:13,17,20;77:3,13, 24;78:7;81:23;82:3,10; 83:14,19;88:13;91:5,8, 18,24;95:14,17;96:6, 16,22;97:3,8,13,23; 98:17;100:15;102:2</p> <p>offset (1) 32:21</p> <p>often (3) 26:6;58:7;61:18</p> <p>old (4) 14:3;68:19,20;84:1</p> <p>omit (2) 70:23,24</p> <p>on/off (1) 33:8</p> <p>once (6) 11:22;61:3;86:8; 94:17;95:3,9</p> <p>one (80) 4:2,3,3,8;13:9;11; 10:2,10;12:11;15:18; 16:6,10,21;21:7;24:19; 25:19,19;30:12;31:14,</p>	

<p>15,15;32:16;33:22; 34:1,2,22;35:7,9;36:8, 11,17;38:9;39:5;40:12; 41:2;44:2;45:5,14; 46:5;47:24,24;49:20; 51:20;52:17;54:13,17, 22;57:15,18,19;58:6,8, 10,17;60:10,12,17; 61:10;63:18;64:7; 65:12;66:12;67:10,21; 68:18;69:20;71:17; 75:2;78:12;80:24;82:4, 16;83:22;85:10,19; 87:3;88:19;92:10,16; 93:16;99:17</p> <p>O'Neal (40) 34:12;37:5,5;42:24; 49:2;50:15,19;51:22; 53:16;54:11,19;56:9, 10,12;61:13;62:5,16, 22;63:20;64:11,15,22; 65:18;66:11,21;68:19; 69:12;70:10,14,19; 71:7,12;72:23;73:8,13; 74:12;76:10,15;87:14; 91:22</p> <p>O'Neal's (1) 51:9</p> <p>one-hour (23) 14:21;15:1;16:6,10; 18:2;23:8,9;31:14; 34:4;43:23;47:8,9; 50:8;59:6,12,14;61:5; 73:22;74:23;75:7,20; 76:3;95:1</p> <p>one-number (1) 68:12</p> <p>ones (1) 26:8</p> <p>one-second (1) 69:17</p> <p>only (15) 14:14;17:7;23:10; 43:18;51:13;52:10; 54:23;62:13;63:14; 66:16;77:11;82:13; 86:8;88:8;89:7</p> <p>open (1) 98:12</p> <p>operating (2) 57:1;84:21</p> <p>operation (4) 13:13,15;27:20;60:7</p> <p>operational (2) 11:23;79:11</p> <p>operator (1) 59:5</p> <p>opinion (7) 50:9;66:8;73:23; 80:14;81:4;97:5;99:14</p> <p>opportunity (10) 6:13;11:3,19;23:24; 24:13;29:7;53:2,8;</p>	<p>91:16;97:16</p> <p>opted (1) 32:16</p> <p>orchestra (2) 85:12,21</p> <p>orchestras (1) 85:15</p> <p>order (4) 7:12,14;56:9;76:21</p> <p>orderly (1) 7:1</p> <p>ordinance (1) 34:16</p> <p>ordinances (1) 42:12</p> <p>organizational (1) 4:13</p> <p>original (1) 82:23</p> <p>originated (1) 79:15</p> <p>others (2) 20:20;76:9</p> <p>Ours (1) 33:15</p> <p>out (44) 4:3;7:11;17:17; 19:12;22:24;23:1;28:1, 11,21;30:19;31:5; 35:11;36:12;40:13; 41:5;42:24;43:24; 44:20,21;45:3;46:2,8, 22;51:17;56:21;58:19; 60:10;63:19;74:4,9; 75:5,9;76:5;78:6; 83:15;85:2;86:6,21; 87:1,20;95:24;99:18, 21;100:9</p> <p>outside (3) 19:12;78:24;80:12</p> <p>over (41) 13:23;16:8;18:9,13; 19:3,14;26:5;32:13; 33:24;35:19;38:2; 39:13;42:22;43:7; 46:16;49:17,23;57:12; 59:18;61:3;64:1;66:1, 2,4,6;67:7,11;68:11; 69:16;70:1;71:16,17, 18,19;84:20,22;85:1; 86:13;95:4,9;99:19</p> <p>oversimplify (1) 80:20</p> <p>oversimplifying (1) 79:18</p> <p>own (5) 15:21;20:24;27:13; 50:11;98:10</p>	<p>93:5,7,13,13,16;94:4; 95:6</p> <p>pages (1) 49:23</p> <p>part (20) 13:9;20:6,7;27:3; 34:16;37:7;40:16; 44:17,22,22,24;59:24; 60:3;62:2,7;66:14,17; 79:24;80:3;87:12</p> <p>participated (1) 12:14</p> <p>participation (1) 13:1</p> <p>particular (3) 17:6;54:24;80:7</p> <p>particularly (4) 24:11;30:5;62:2; 101:13</p> <p>parties (2) 79:14;101:4</p> <p>pass (2) 25:15,17</p> <p>passed (1) 11:9</p> <p>passes (1) 25:17</p> <p>passing (1) 12:2</p> <p>past (1) 23:12</p> <p>pasted (1) 92:14</p> <p>Pause (1) 10:23</p> <p>peaks (8) 19:18,20;86:15; 89:21;94:1,12;95:5,10</p> <p>peer-review (1) 50:11</p> <p>peer-reviewed (1) 50:23</p> <p>people (21) 9:11,14;20:5;21:2; 23:15;24:11,21;26:20; 27:17;28:22;32:21; 34:4;42:24;43:1;46:7; 55:17;58:17;65:1; 82:14;92:2;93:22</p> <p>people's (1) 82:22</p> <p>per (4) 18:9;25:11,16,17</p> <p>percent (4) 63:4,6;81:7;94:8</p> <p>perception (1) 30:19</p> <p>Perfect (2) 5:11,16</p> <p>perfectly (2) 77:8;81:9</p> <p>performed (1) 81:20</p>	<p>period (56) 6:15,17;7:4;17:15; 19:3,14;38:2;42:4,6; 44:4,19;45:17;46:1; 49:21;52:7;54:2,9,15; 57:20;58:13;59:6,9,13, 20;60:7;61:5,10,16,19; 63:1;64:2;65:19;66:9; 67:8,9,12;68:12,14; 69:17;70:2,17,22;71:1, 16,20;73:6,9,11,15,21; 74:18,19;75:5,15;76:3; 82:6</p> <p>periods (9) 26:7;49:10;61:19; 73:18;74:13,21;75:3,6; 77:19</p> <p>period's (1) 60:14</p> <p>person (3) 40:7;42:10;100:13</p> <p>personally (1) 25:2</p> <p>perspective (1) 49:24</p> <p>phenomenon (2) 88:2,4</p> <p>phone (1) 80:17</p> <p>pick (6) 45:4;60:9;68:16; 69:11;70:3;72:6</p> <p>picking (1) 70:7</p> <p>picks (1) 89:20</p> <p>pistol (1) 84:18</p> <p>place (6) 13:23;20:24;39:10; 43:18;46:16;79:24</p> <p>places (3) 14:9;56:19;57:11</p> <p>plan (3) 44:21;96:20;101:11</p> <p>plane (2) 14:11,21</p> <p>Please (7) 4:8,10,14;28:21; 29:22;81:22;98:24</p> <p>pleases (1) 77:12</p> <p>plenty (1) 76:12</p> <p>plus (1) 62:11</p> <p>pm (6) 7:6;15:10;22:5; 92:24;99:2;102:7</p> <p>point (24) 5:14;16:10;23:6; 28:10,18;31:3,23;34:6; 35:22;40:3,12;43:12;</p>	<p>58:15;59:21;60:20; 63:15,19,24;64:8; 68:17;71:5;76:21;84:2; 87:3</p> <p>point-counterpoint (1) 44:6</p> <p>pointing (2) 44:1;51:17</p> <p>points (6) 30:11;49:12;54:1; 70:7,12;101:23</p> <p>polite (1) 87:2</p> <p>pool (1) 87:22</p> <p>pop (1) 55:23</p> <p>portion (1) 85:4</p> <p>position (1) 89:15</p> <p>possible (6) 8:1;9:23;61:8;63:16; 70:13;101:15</p> <p>post (1) 48:18</p> <p>post-construction (14) 22:19;36:23;40:10, 17;41:18;54:19;58:1; 59:22;60:21,23;72:12; 76:6;93:8;94:23</p> <p>posting (1) 95:7</p> <p>potentially (1) 82:19</p> <p>potentials (1) 80:19</p> <p>power (1) 38:1</p> <p>practical (3) 31:13;49:24;74:12</p> <p>precedence (1) 16:3</p> <p>precedent (1) 49:5</p> <p>pre-construction (1) 75:21</p> <p>predate (1) 54:23</p> <p>predated (1) 32:5</p> <p>predict (1) 58:23</p> <p>predictable (1) 58:22</p> <p>prefer (2) 9:22;84:6</p> <p>premise (1) 56:24</p> <p>preparation (1) 4:16</p> <p>prepared (2) 9:10;50:7</p>
--	---	--	---	--

<p>present (4) 8:22;45:1,2;62:8</p> <p>PRESIDING (91) 3:2,8,17,24;5:10,15,22;6:4,7,23;8:4,8,19,23;9:21;10:9,13,21;15:13,17;16:13,16;17:13;18:16,21;23:18;24:1,4;28:19,24;29:3,8,11,20;35:2,6;36:5,10;37:18,22;40:19;44:11,16;45:12;47:18;48:3,6,10;52:23;53:3,6;55:14,20;56:2,6;61:11,24;62:18;63:11;64:6,12;66:18;76:13,17,20;77:3,13,24;78:7;81:23;82:3,10;83:14,19;88:13;91:5,8,18,24;95:14,17;96:6,16,22;97:3,8,12,23;98:17;100:15;102:2</p> <p>pretty (3) 9:16;69:6;84:14</p> <p>previously (1) 79:23</p> <p>primary (1) 54:13</p> <p>prime (1) 82:16</p> <p>principles (1) 58:16</p> <p>prior (2) 4:15;16:2</p> <p>probably (7) 26:6;50:17;58:9;66:12;68:4;82:1;100:17</p> <p>problem (2) 7:24;46:20</p> <p>procedures (11) 6:21;28:9,13,17;60:3;62:14,16;79:3,12;80:6;100:24</p> <p>proceeding (1) 48:16</p> <p>proceedings (2) 10:23;30:8</p> <p>process (15) 11:15;12:6,9,22;16:1;17:20;18:4,4;20:14;30:22;31:4,6;38:11;83:10;98:16</p> <p>produced (2) 15:6;51:21</p> <p>professional (2) 54:14;61:17</p> <p>programs (1) 69:8</p> <p>project (9) 35:14;36:9;39:14;46:16;47:12;48:24;52:3;54:20;75:24</p>	<p>projects (4) 11:20;32:1,2;57:6</p> <p>promised (1) 27:18</p> <p>pronounced (1) 29:14</p> <p>proper (3) 37:4;93:19;94:19</p> <p>properly (3) 15:24;16:4;82:15</p> <p>property (1) 81:3</p> <p>proposed (1) 41:8</p> <p>proposing (2) 75:24;93:22</p> <p>protect (2) 28:3;31:18</p> <p>protected (1) 21:3</p> <p>protection (2) 26:10;27:16</p> <p>protective (2) 13:10;23:14</p> <p>protocol (1) 14:18</p> <p>prove (1) 46:11</p> <p>provide (11) 4:11,15;6:11;11:19;13:2,2;23:14;36:24;51:5;98:9,14</p> <p>provided (2) 14:22;44:6</p> <p>providing (1) 47:3</p> <p>public (23) 3:16;4:20;6:11,17;7:19;9:1;11:19;12:17;13:1;31:18;41:9;50:24;52:17;59:4;80:17;97:15,18,20;98:3;100:20;101:6,20;102:6</p> <p>publish (1) 100:21</p> <p>pull (2) 50:4;91:19</p> <p>pulled (1) 18:8</p> <p>purpose (2) 12:24;31:17</p> <p>purposes (1) 13:9</p> <p>put (18) 14:2,4,18;15:21;21:10;39:17;40:1;42:3;44:4;46:1;55:10;56:21;58:7;63:12;73:21,22;84:17;85:18</p>	<p>6:15</p> <p>quick (2) 59:10;61:10</p> <p>quickly (2) 15:20;69:10</p> <p>quiet (2) 32:19;34:3</p> <p>quietest (2) 63:3,4</p> <p>quite (3) 9:10;24:17;26:10</p> <p>quote (1) 52:11</p>	<p>11:16</p> <p>recognized (1) 43:20</p> <p>recognizing (1) 11:16</p> <p>recommend (2) 61:18;74:9</p> <p>recommendation (4) 7:13;100:22;101:3,7</p> <p>record (8) 13:20;14:7,8;29:21;43:4;52:13;57:17;97:1</p> <p>recorded (1) 4:6</p> <p>recording (2) 46:13;94:21</p> <p>red (2) 92:13;93:20</p> <p>redesign (1) 83:5</p> <p>refer (1) 91:11</p> <p>reference (4) 16:6;37:16;59:23;94:13</p> <p>referenced (1) 51:3</p> <p>references (1) 45:10</p> <p>referencing (1) 38:17</p> <p>referring (2) 29:17;44:3</p> <p>refined (1) 69:19</p> <p>regard (4) 30:6;37:17;38:8;57:14</p> <p>regarding (3) 13:21;14:12;80:18</p> <p>register (1) 7:9</p> <p>registered (2) 6:11;9:8</p> <p>regulation (1) 58:15</p> <p>regulations (8) 11:18;13:11;28:6;70:20,21;92:6,10,12</p> <p>regulators (1) 59:4</p> <p>rehash (1) 97:4</p> <p>related (2) 12:3,12</p> <p>relates (1) 79:7</p> <p>relevant (3) 4:12;40:15;58:17</p> <p>Reliable (1) 32:3</p> <p>reliance (1) 38:15</p>	<p>relied (1) 79:10</p> <p>rely (1) 51:21</p> <p>remarks (2) 24:14;56:14</p> <p>remember (2) 68:20;96:1</p> <p>remind (1) 100:18</p> <p>remove (2) 18:22;19:4</p> <p>removed (1) 17:22</p> <p>render (1) 48:21</p> <p>repeat (1) 84:11</p> <p>repeatable (1) 58:18</p> <p>report (17) 40:8;49:17,19,22;50:8;51:1,4,22,24;52:5,6;75:9;93:17;94:5,5,7,23</p> <p>reporter (18) 4:7,15;5:7;15:5;22:2,12;30:3,14;32:6;33:11;34:20;36:2;37:13;42:5;43:5;44:23;62:15;97:7</p> <p>reporting (1) 46:10</p> <p>reports (2) 50:23;93:14</p> <p>represent (2) 48:14,15</p> <p>representative (1) 3:13</p> <p>represented (1) 97:17</p> <p>representing (1) 8:16</p> <p>request (3) 7:9,16;79:2</p> <p>require (1) 60:23</p> <p>requirement (1) 22:6</p> <p>requirements (4) 13:8;79:22;81:21;83:5</p> <p>requires (2) 18:22;57:23</p> <p>requiring (1) 19:3</p> <p>research (4) 75:8,13,14,20</p> <p>researching (1) 95:23</p> <p>resident (3) 11:4;27:7;29:24</p> <p>residential (1) 59:15</p>
	R			
		<p>Rand (2) 51:21;93:16</p> <p>Rand's (1) 52:5</p> <p>range (6) 26:1,3,5;84:18,18,21</p> <p>rate (3) 69:4;93:19;94:19</p> <p>rather (1) 32:2</p> <p>raw (2) 47:2,3</p> <p>reaching (1) 43:23</p> <p>react (1) 26:20</p> <p>read (10) 14:24;25:10,13;30:9;37:6,10;76:12;78:17,22;99:15</p> <p>reading (3) 40:7;99:23;100:1</p> <p>reads (1) 33:16</p> <p>ready (2) 10:2;85:23</p> <p>really (16) 14:5;26:12;34:22;39:16;40:14;57:13;58:14;62:7;64:24;65:23;66:8;68:11;70:3;72:8,15;75:22</p> <p>reason (9) 38:6,7;42:19,21;68:17;70:24;72:9;75:3;89:16</p> <p>reasonable (6) 18:12;39:19;45:17;46:3;71:24;73:10</p> <p>reasons (4) 32:16;56:23;66:12;82:16</p> <p>rebuttal (1) 53:2</p> <p>receive (1) 7:8</p> <p>recognition (1)</p>		
	Q			
	question-and-answer (1)			

<p>residents (5) 27:15,18,21;28:3; 81:2</p> <p>respect (1) 15:3</p> <p>respond (2) 27:4;65:1</p> <p>responded (1) 51:22</p> <p>responds (1) 26:18</p> <p>response (13) 17:24;22:21;41:21, 21;57:23;58:2,5,6,11; 68:23;69:1,6;93:10</p> <p>responsibility (1) 39:7</p> <p>rest (2) 9:16;40:8</p> <p>Restrooms (1) 4:3</p> <p>result (3) 12:18;35:14;80:11</p> <p>results (3) 47:9;58:21;81:13</p> <p>review (1) 14:17</p> <p>revolutions (2) 25:11,16</p> <p>Richard (2) 9:8;24:7</p> <p>rifle (2) 84:17,21</p> <p>right (57) 3:3,5;4:1,5,18;5:16, 23,24;6:8,9;8:9;9:7; 10:5,14;12:19;23:19; 24:5;29:13,14,21; 30:10;34:19;36:6;41:5, 5;43:12,22;45:5,7; 46:22;47:2,6;48:4,7, 11;56:8,23;70:13; 71:20;72:14,19;75:9; 76:18;77:14;78:8;83:3, 20,21;88:14,23;89:19; 91:6,9;95:15;96:8; 100:17;102:3</p> <p>Road (4) 24:7;59:18;86:6,7</p> <p>Rob (3) 50:14;56:9,11</p> <p>robust (2) 13:20;59:19</p> <p>rock (1) 24:21</p> <p>roll (3) 3:7;5:23;8:5</p> <p>rolling (1) 86:19</p> <p>room (1) 10:8</p> <p>rotation (1) 25:11</p>	<p>rough (1) 101:19</p> <p>Route (1) 18:7</p> <p>RSP (1) 50:16</p> <p>rule (31) 14:11,22;16:9;18:5; 21:1;23:9;31:17,23; 36:22;38:24;39:1,4,7,8, 10;43:18;45:9,10,11; 49:6;50:1;55:5,7; 57:23;61:14;66:10; 68:3;73:5,12;100:3,8</p> <p>rulemaking (8) 12:9,21;18:4;20:14; 31:4;38:8,10,11</p> <p>rules (34) 6:9;11:18;12:19,23, 24;13:14;14:10;15:24, 24;16:22;17:4;18:1,17; 21:11,14;28:6,13; 30:21;37:6,23;38:13; 49:4;51:14;52:20; 54:24;57:18;58:8; 59:23;60:23;65:14; 76:1,1;80:11;81:5</p> <p>running (2) 38:11;62:11</p> <p>rural (1) 23:15</p>	<p>40:17</p> <p>SEC (26) 3:8,16;14:5,11;28:2, 6;30:7,12,13;31:17; 32:10;38:9;42:1;46:17; 49:5;50:10;57:18,22; 61:14,20;65:14;79:10; 81:5;84:1;92:9,11</p> <p>Second (62) 5:21;17:8,12,14; 18:24;19:1;20:24;21:7, 9,19,20;22:15,17,18; 23:1,4;31:3,15,15; 33:16,22;34:9;35:11, 24,24;37:3,4,17;38:23; 43:15;44:5;45:17,24; 46:4,5;48:19;53:23; 54:5;57:9,19,24;58:6; 59:19,21;60:17,19; 61:9;63:16;64:4;66:14; 68:18,18;69:3,15;70:6; 84:23,24;85:17,19; 87:12;93:5;100:5</p> <p>seconds (11) 21:7;22:8;23:10; 25:19;34:1;45:24;46:5; 47:10;57:24;84:24; 86:13</p> <p>sections (1) 60:1</p> <p>seeing (1) 14:2</p> <p>seek (1) 80:4</p> <p>seem (1) 84:2</p> <p>seemed (1) 78:23</p> <p>seems (2) 28:14;30:18</p> <p>selectmen (2) 78:12;79:9</p> <p>Senate (3) 11:10,10,10</p> <p>sense (7) 28:21;43:2,8;49:24; 57:12;68:14;71:4</p> <p>separate (2) 9:4;80:9</p> <p>September (1) 94:6</p> <p>serve (2) 3:12,15</p> <p>served (1) 24:10</p> <p>Services (1) 3:14</p> <p>set (11) 22:14;23:20;28:7; 38:18;55:16;57:17,18; 70:17;86:16;91:6,7</p> <p>settings (1) 58:4</p>	<p>several (1) 49:7</p> <p>shall (21) 6:17;14:13,13,20; 15:7;18:15;21:19,23; 22:20;41:10,12,19; 54:7;57:7,9;65:16; 66:3;73:6;92:18;93:4,8</p> <p>shall/must (1) 60:12</p> <p>sharp (1) 86:2</p> <p>shooting (2) 26:1,5</p> <p>short (4) 34:6;70:2;71:21; 86:1</p> <p>shorter (1) 75:15</p> <p>shortly (2) 49:2;50:15</p> <p>shots (2) 26:7,8</p> <p>show (6) 31:12;35:20,22;47:8; 75:17;76:7</p> <p>showed (4) 45:20;75:14,19,20</p> <p>showing (2) 93:18;95:9</p> <p>shown (1) 75:9</p> <p>shows (4) 25:18;35:8;46:6; 76:4</p> <p>shut (3) 52:3,11;62:12</p> <p>side (2) 4:4;74:6</p> <p>sideways (1) 85:14</p> <p>significant (2) 31:16;94:2</p> <p>significantly (2) 31:7;35:12</p> <p>silent (2) 20:7;90:15</p> <p>similar (3) 20:19;58:20,21</p> <p>simple (2) 25:18;49:13</p> <p>simpler (1) 83:10</p> <p>simply (2) 44:19;52:21</p> <p>single (4) 8:16;36:15;63:14,15</p> <p>sit (1) 68:2</p> <p>Site (12) 11:17;23:5;41:4; 46:11;49:8;54:3;55:5; 92:9,11,11;94:5;95:8</p>	<p>sited (1) 90:14</p> <p>sites (1) 93:15</p> <p>siting (1) 13:10</p> <p>sitting (5) 46:17;66:12;84:20; 85:23;89:9</p> <p>situated (1) 34:24</p> <p>situation (1) 26:11</p> <p>six (6) 23:5;63:3;74:13,16, 20,21</p> <p>size (1) 33:4</p> <p>slams (1) 17:18</p> <p>sleep (1) 26:22</p> <p>slide (9) 31:24;33:2,6;35:8; 38:9;45:19,20,21; 101:16</p> <p>slides (2) 35:23;44:14</p> <p>slow (3) 58:5;68:23,24</p> <p>Slow-end (1) 87:10</p> <p>slowly (1) 56:13</p> <p>smaller (1) 60:14</p> <p>smallest (1) 73:15</p> <p>snapshot (1) 49:12</p> <p>soft (1) 85:15</p> <p>somebody (5) 17:18;20:7;75:23; 84:16;88:6</p> <p>someday (1) 78:6</p> <p>Somehow (3) 14:19;38:23;57:3</p> <p>someplace (1) 21:14</p> <p>sometimes (1) 89:7</p> <p>somewhat (3) 10:6;13:24;67:13</p> <p>somewhere (2) 39:6;43:24</p> <p>son (1) 26:2</p> <p>sophisticated (1) 27:6</p> <p>sorry (4) 37:11;44:22;77:4;</p>
---	--	---	--	--

S

<p>97:9 sort (1) 76:11 sound (117) 6:21;15:3,6,9;16:23; 19:16,24;20:2;21:4,17, 18,19;22:4,18;23:1; 24:18;25:1,9,14;26:4; 27:9,11;28:12;30:17; 32:4;35:24;36:23;37:8; 38:1;40:10;41:17; 48:20;49:17,19;51:20; 53:14,22;54:20;56:16, 16,18;57:14,17;58:1, 15,23;59:17;60:6;61:2; 62:10;63:6;64:20; 65:21,24;67:1,4,5,6,7, 12,13,15,16,20,21,24, 24;68:5,7,20;69:21; 70:21;71:15,21,24; 72:15,15;79:8,21;80:6; 81:17,20;84:4,11,13; 85:9,16,20;87:8,9,19, 24;88:10,12,21;89:12; 92:6,10,18,20,22,23; 93:7,14,17,18,22,24, 24;94:4,5,6,9,10,23; 99:14;100:24 sounds (11) 20:1;27:7;69:11,16; 72:4;85:8;87:10,11; 88:5;90:4,19 source (6) 62:11;65:24;67:13; 72:4,5;75:18 sources (1) 19:20 speak (13) 4:8;6:13;7:13;8:1; 9:19;11:3;15:22;17:6; 24:13;56:13;76:24; 91:16;97:19 speaker (6) 6:15;8:20;9:8;10:3; 23:22;91:9 speakers (9) 7:10,13,14,17,20,24; 8:10;9:4;96:9 speaker's (1) 6:16 speaking (3) 4:9;79:2;89:13 spec (1) 93:6 specific (7) 12:5,12,23;13:7; 20:21;45:11;70:12 specifically (2) 22:23;72:6 specifications (1) 28:6 specified (3) 39:19;43:19;61:17</p>	<p>specifies (1) 23:9 specify (2) 38:4,24 speed (9) 18:8,11,13;38:22,24; 39:2;57:16;58:11;87:7 speeds (2) 87:10,11 spending (1) 80:16 spent (2) 32:12;83:7 split (1) 71:6 spokesperson (1) 24:10 sponsored (1) 75:11 stakeholder (4) 12:3,6;30:22;31:6 stand (1) 44:8 standard (81) 15:2,3,4;20:17,23; 21:6;22:9,14;30:13,17, 20,23;31:8;32:8,14,15, 24;33:3;34:16,17; 35:12,16,18,19;37:6; 38:18;39:6,19;40:3,4, 5;41:3,24;42:1,22,22; 43:23;44:1,2;45:1,9, 10;48:20,24;53:24; 54:6;57:3,5,21;58:14; 59:24;60:2,8,12,18; 62:3,6,19,23;64:19,23; 65:11;70:18;71:9,11, 24;72:21,22;73:4; 75:16,20;76:2;85:4; 88:22;89:4,7,24;99:12, 16,18,20 standards (16) 11:22;32:4;51:14; 54:18;61:15;62:1;63:8, 9;75:10;79:11;80:5,11; 82:23;83:4;89:17; 92:17 Start (4) 3:10;56:22;83:23; 99:5 started (5) 3:4;10:14;11:16; 68:21;79:2 starting (1) 24:15 state (11) 4:10;12:8;27:19; 29:22,24;30:16;31:20; 32:9;43:8;52:2;78:9 stated (6) 21:16,16;38:12; 94:24;100:3,6 statement (1)</p>	<p>94:14 states (1) 15:3 stating (1) 21:14 statistical (4) 40:1;61:2;62:24; 72:10 status (1) 11:24 steady (3) 25:5,8;67:22 stick (2) 28:21;32:24 still (5) 34:1;39:18;41:14; 55:18;101:12 stood (1) 25:6 stop (1) 31:16 stories (1) 84:5 straightforward (2) 14:12;74:24 strong (2) 90:21,22 study (6) 20:8;21:4;37:8; 53:22;75:12;95:1 stuff (2) 50:3;95:22 Subcommittee (20) 3:8,12,20,23;6:14; 7:8;10:18;16:19;29:19; 48:9;56:11;78:18;80:2; 91:14;98:15;99:6; 100:21;101:1,12,18 Subcommittee's (3) 6:19;7:3;80:13 subject (3) 12:11;37:3,4 submit (3) 76:10;98:24,24 submitted (1) 7:5 subsided (1) 94:16 substantial (1) 59:3 suffered (1) 24:17 suffering (2) 24:23;32:22 suggest (4) 9:13;59:16;80:9; 83:6 suggested (2) 14:18;17:11 suggesting (1) 16:7 supported (1) 82:17</p>	<p>supposed (3) 52:9;85:7;92:5 Supposing (1) 85:11 Sure (13) 15:19;44:13;53:15; 54:10;55:1,22;66:23; 73:13;76:13;79:4; 98:13;99:16;101:14 surprised (1) 55:10 suspected (1) 100:10 sympathy (1) 96:4 system (1) 97:19 systems (1) 92:17</p>	<p>terminology (1) 63:10 terms (7) 17:10;28:12;62:9; 63:9;71:23;79:23; 83:12 test (5) 16:11;25:23;33:8; 38:19;59:3 tested (2) 69:18;72:11 testified (2) 50:20,21 testimony (6) 10:15;30:9;64:15; 83:9;91:17;101:3 testing (4) 25:20;58:1;69:7; 72:11 textbooks (1) 67:18 thankfully (1) 67:16 Thanks (2) 48:5;96:3 thinking (1) 68:22 third (3) 25:19;60:20;93:7 Thomas (2) 7:9,17 thorough (1) 11:18 thoroughly (1) 28:11 thou (1) 60:12 though (5) 18:6;26:8;45:10; 58:12;68:9 thought (5) 15:18;35:7;61:10,12; 79:1 three (8) 25:12,15;30:11;32:2; 50:19;58:21;72:14; 84:14 threshold (1) 14:19 throw (1) 75:4 tight (1) 16:17 till (1) 30:20 timely (1) 81:16 times (9) 26:4;32:19,21,22; 49:8;66:22;69:3;88:8; 89:10 Tocci (2) 50:12;51:10</p>
T				
<p>talk (1) 27:2 talked (3) 41:23;57:16;97:6 talking (8) 37:16,24;38:3,13; 62:7;69:24;88:5,6 talks (1) 64:20 task (2) 99:20;100:8 tasked (2) 40:13;99:6 technical (5) 42:10;51:8,19;77:22; 82:14 technician (1) 28:11 technology (3) 27:6;69:6;70:8 teens (1) 24:22 telling (3) 43:1;46:19,23 tells (1) 62:23 temperature (4) 87:14;88:3,20;89:3 tempted (1) 52:1 ten (17) 8:17,22;34:1;37:9; 46:5;60:4;64:2;65:19; 67:10;73:14,16,24; 74:7,11,16;84:24; 93:18 ten-minute (9) 54:21;61:18;73:18; 74:13,18,20,22;75:2,6 term (2) 37:4;42:3</p>				

Tocci's (1) 94:5	32:14	36:22;37:11;38:11; 55:5,7;58:20;63:20; 67:19;79:1	validating (2) 6:22;100:24	waves (1) 86:19
today (19) 9:5;11:3;12:23; 13:11,22;14:8,15; 30:12;33:18,19;34:12; 48:18;53:18;56:14; 66:13;69:7;91:16;98:8; 102:4	trip (1) 86:18	underlying (1) 48:16	validation (2) 40:14,16	way (20) 3:10;25:23;39:3,8; 40:2;42:18;43:16,22; 47:1,23;50:1,51;11; 52:10;54:23;69:10; 70:17,19;74:17;81:12; 99:17
together (2) 14:19;72:17	troubling (1) 81:1	understood (2) 18:5;38:14	valleys (2) 19:18,21	wear (1) 24:24
told (1) 18:7	trucks (3) 75:4;86:7,7	undertaken (2) 80:10;81:17	variability (1) 32:20	week (2) 55:18;65:22
Tom (10) 3:15;5:1,11;6:4,5; 23:19;47:20;55:14; 88:16;91:6	true (1) 57:3	undertaken (2) 13:22;15:14	variable (1) 72:2	weeks (1) 7:4
took (2) 27:23;35:18	try (7) 43:23;45:6;46:11; 56:12;67:19;70:22; 75:17	unit (2) 36:15,16	variation (1) 67:14	weight (1) 68:5
topic (2) 11:8;12:11	trying (22) 9:22;14:5;16:17; 27:2;45:7,8;46:21; 59:8;61:6;63:22;71:24; 72:5,8;75:22,23;77:18; 79:6;82:22;83:6,15; 96:3,5	unless (2) 69:22;101:22	variations (1) 25:24	weighting (1) 64:23
total (3) 8:18;62:10;85:4	turbine (21) 20:2;25:5;26:13; 27:7,22;30:21;32:20; 33:7,21;35:10;56:15, 17;57:1,4,6;65:21,23; 72:10,15;75:12;91:23	unlikely (1) 47:23	various (1) 14:9	weights (2) 65:10;67:24
totally (3) 47:24;48:1;87:6	turbines (16) 12:13;24:9;25:10; 26:20;28:4,23;30:17; 31:19;33:9,10,12; 34:24;48:2;59:1;68:7; 75:19	unnecessarily (1) 80:16	vary (1) 67:13	welcome (1) 78:5
toward (1) 62:8	turn (1) 33:2	unreasonable (4) 31:21;41:9;71:4; 72:22	vast (1) 52:15	weren't (2) 4:21;5:1
towards (1) 6:16	turned (1) 33:10	unreliable (1) 75:16	Vermont (1) 79:3	whatnot (1) 101:18
towers (2) 25:15,17	TURNER (4) 3:19,19;8:7;96:19	unworkable (2) 51:16;52:19	version (2) 4:14;87:18	what's (8) 9:17;17:20;37:2,3; 52:2;54:2;60:16;86:10
town (6) 35:18;76:23;78:13; 79:19;80:15;82:6	twenties (1) 24:23	up (28) 27:12;28:7;30:20; 33:21;44:8;47:22; 55:19,23;60:14;65:6; 68:16;69:11;70:4,7; 72:7;74:7,15;75:6; 77:18;85:13;86:16; 87:19,23;88:20;89:20; 92:4;95:22;98:20	versus (5) 21:4;31:14;46:4; 68:18;90:16	whatsoever (1) 71:5
towns (1) 89:8	two (20) 7:4,10,17;8:24;9:3, 11,14;26:5;32:16,18; 35:22;57:13;58:3,18; 70:3;85:19;86:9;89:17; 95:9;96:11	ups (1) 85:9	via (3) 7:5;27:19;99:1	whereas (1) 9:16
Township (4) 34:13,15;39:14; 45:21	two-minute (1) 95:7	urging (1) 28:8	viable (1) 52:10	WHEREUPON (1) 102:6
traffic (2) 47:23;48:1	type (5) 17:5;71:10;72:3; 75:18;98:12	use (14) 19:13;20:17;37:9; 42:3;58:4,8;59:8,19; 60:10,12,61:18;62:17; 68:22;75:5	violation (1) 80:18	whole (1) 12:3
training (1) 51:19	typical (1) 60:10	used (12) 20:19;42:1;50:8; 52:6;57:20;58:10,13; 61:20;68:10,18,20; 69:1	violations (1) 81:17	whomp (2) 25:8,8
TransAlta (1) 15:21	typically (1) 42:11	useful (1) 72:10	violin (1) 85:21	whomping (1) 25:13
transcript (1) 4:17	U	uses (1) 25:21	visual (1) 94:3	whomps (1) 26:21
transient (6) 18:23;24:18,24; 25:22;26:11,18	ultimately (2) 36:12;82:7	using (6) 16:5;20:22;59:6; 60:18;61:17;63:14	vote (2) 6:1,2	whoop (4) 19:21,21,22;20:6
translates (1) 89:23	unconfuse (1) 84:9	usually (2) 21:5;70:16	W	whoops (1) 20:1
transmission (1) 13:5	under (9)	utilized (1) 79:20	wade (1) 53:15	whoosh (2) 25:8,9
transparency (1) 13:2		V	wait (1) 9:9	whooshing (1) 25:14
transportation (1) 74:5			waive (1) 28:9	who's (3) 34:12;75:24;84:17
trap (1) 88:10			waiver (1) 81:8	wiggle (1) 69:2
trapped (1) 87:24			wakes (1) 27:12	wildly (1) 73:2
trash (1)			WARD (16) 9:13;76:18;77:8,11; 78:4,5;83:22,23;88:18, 24;89:5,16;90:1,6,10, 18	Wilkas (6) 91:9,10,13,15,21; 92:4
			waste (1) 39:1	Wind (75) 7:10,18,18;8:21;
			watching (1) 28:1	

12:5,13;13:5,9,12,13, 15:19;19:20;2:24;8; 25:6;26:13,20;30:2,8; 31:19;32:4,5;35:23; 36:1,4;38:20;42:23; 43:22;46:10,15,23; 47:3,21;48:2,14,15,22; 49:3;50:14,18;54:20; 56:15,17;57:1,3,5,10, 11;59:1,5;65:21;72:2, 10,12,15,22;73:12; 75:12,18;79:14;80:1,7; 81:15;87:6,7,23,24; 88:23;90:5,9,16,20; 91:23;92:16;94:16	66:9;70:22;76:11;98:9, 10;101:2,8 wrong (2) 52:21;83:3 wrote (2) 52:5;101:10	1:00 (1) 3:3 10 (2) 63:4;70:1 100 (6) 18:9;19:16;84:22; 85:1,2;86:10 10th (1) 94:8 11 (1) 47:22 11th (1) 52:5 12 (1) 52:6 12.9 (4) 37:7;44:22,24;62:7 125 (6) 22:8;23:10;45:23; 57:23;71:3;72:20 125-second (2) 17:9;22:20 14 (2) 30:5;38:17 15 (3) 25:11,16;30:5 150 (2) 86:10,11 15-plus (1) 56:16 15th (1) 100:21 168 (1) 65:22 16th (3) 101:6,14,16 18 (1) 38:18 1st (2) 7:6;99:3	2016-2017 (1) 43:11 2019 (1) 13:16 2020 (2) 49:16;50:8 2021 (3) 5:19,19;7:6 2021-02 (1) 3:9 20th (3) 4:20,23;5:19 21st (3) 4:20;5:19;83:4 245 (1) 11:10 24th (1) 13:16 281 (4) 11:11;12:4,4;13:7 28th (1) 13:16 29th (1) 101:5 2nd (1) 94:6	45 (18) 15:8;21:24;23:3; 25:17;33:21,24;41:12; 42:14;46:12;54:7,7; 57:22;65:13,16;66:1; 73:7;92:19,22
winds (4) 88:1,10;90:19,21 Wind's (1) 52:8 Winter (1) 49:16 wish (2) 4:10;24:20 within (6) 14:2,3,8,14;17:3; 20:23 without (3) 18:23;39:18;59:3 wonder (1) 83:10 word (7) 16:24;17:6;30:23; 52:4;68:10;78:14; 99:16 wording (1) 31:5 words (8) 52:10;58:19;59:2; 63:5;65:2,18;91:12; 94:9 work (8) 10:12;23:12;34:18, 18;48:2;50:12;98:3; 101:10 worked (2) 12:1;24:21 working (5) 10:1;11:8;51:2,6; 52:16 works (2) 70:18;101:15 worry (1) 84:3 wrap (1) 77:18 write (1) 42:17 writing (2) 42:10;83:24 written (20) 4:14;5:4;7:2;28:11; 33:16,17;39:4,8,8; 42:12;43:13,16,21;	Y yard (1) 23:17 years (6) 23:13,13;24:9;30:5; 56:16,17 yield (1) 77:22 York (1) 79:3 young (2) 24:19,21	10th (1) 94:8 11 (1) 47:22 11th (1) 52:5 12 (1) 52:6 12.9 (4) 37:7;44:22,24;62:7 125 (6) 22:8;23:10;45:23; 57:23;71:3;72:20 125-second (2) 17:9;22:20 14 (2) 30:5;38:17 15 (3) 25:11,16;30:5 150 (2) 86:10,11 15-plus (1) 56:16 15th (1) 100:21 168 (1) 65:22 16th (3) 101:6,14,16 18 (1) 38:18 1st (2) 7:6;99:3	2016-2017 (1) 43:11 2019 (1) 13:16 2020 (2) 49:16;50:8 2021 (3) 5:19,19;7:6 2021-02 (1) 3:9 20th (3) 4:20,23;5:19 21st (3) 4:20;5:19;83:4 245 (1) 11:10 24th (1) 13:16 281 (4) 11:11;12:4,4;13:7 28th (1) 13:16 29th (1) 101:5 2nd (1) 94:6	5 5 (12) 7:6;15:8,12;21:24; 22:3;41:13;85:3;92:19, 22;93:1;94:4;99:2
Z zero (1) 84:23 zeros (4) 85:1,2;86:12,16 Zoom (1) 78:22	1 1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	6 (2) 63:3;95:6 60 (4) 19:17;49:17,17;63:4 65 (2) 88:7,8 67 (2) 59:15,18
0 0.125-second (1) 93:9	1	3	7 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1	1	3	8 8 (8) 15:10,10;21:7;22:5, 5;92:24,24;94:7	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;99:13 301.14f2 (1) 41:5 301.18 (8) 31:5;37:11;38:6,15, 16;43:19,21;49:8 301.18e6 (2) 23:5;41:15 34 (1) 56:17	8 (1) 94:7 70 (1) 18:15 70-mile-an-hour (1) 18:8 7th (1) 51:23	
1.65-megawatt (1) 33:7 1/10th (2) 33:18;35:24 1/10th-second (3) 33:14;34:5;47:5 1/80th (1) 61:9 1/8th (31) 17:8,11,14;18:24; 19:1,13;20:23;21:9,18, 20;22:14;23:1;31:15; 33:16;35:11,23;37:3,4, 17;38:23;43:15;45:16, 24;47:10;48:19;53:23; 59:19;63:16;64:3; 68:17;100:4 1/8th-of-a-second (16) 20:22;21:3;23:2; 41:20;49:9,11,18,20; 52:18;57:2;59:8;61:7; 68:16;69:4;71:13; 72:24 1/8th-second (5) 31:8;51:12;52:7; 63:22,23	2 2:54 (1) 102:7 20 (1) 70:1 2000 (1) 33:17 2008 (1) 79:15 2012 (1) 11:8 2012-01 (2) 32:7,12 2013 (1) 11:13 2014 (1) 33:17 2014-2015 (1) 42:23 2015 (1) 30:20	3 3 (8) 33:2;37:7;44:22,22, 24;59:24;62:2,7 3:00 (1) 77:18 30 (1) 74:7 301 (3) 38:15;44:21;92:11 301.14 (6) 38:4,16;42:1;43:21; 64:19;		