

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD
-----X
ANKER INNOVATIONS LTD.,

Petitioner,

-against-

Case No.:
IPR2024-00994

POWERMAT TECHNOLOGIES LTD.,

Patent Owner.

-----X

DATE: February 20, 2025

TIME: 11:00 a.m.

CROSS EXAMINATION of GARY L.
WOODS, Ph.D., by the Counsel for the Patent
Owner, held remotely via Zoom
Videoconference, before Suzanne Pastor, a
Notary Public of the State of New York.

1 A P P E A R A N C E S:
2 (All appearances via Zoom)

3 FISH & RICHARDSON
4 Attorneys for the Petitioner
5 60 South 6th Street, Suite 3200
6 Minneapolis, Minnesota 55402
7 BY: NICHOLAS STEPHENS, ESQ.
8 612.766.2018
9 nstephens@fr.com

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
MAYER BROWN, LLP
Attorneys for the Patent Owner
71 South Wacker Drive
Chicago, Illinois 60606
BY: ROBERT G. PLUTA, ESQ.
312.706.8144
rpluta@mayerbrown.com

* * *

1 THE REPORTER: Good morning.
2 The attorneys participating in this
3 deposition acknowledge that I am not
4 physically present in the deposition
5 room and that I will be reporting
6 this deposition remotely.

7 They further acknowledge that
8 in lieu of an oath administered in
9 person, I will place the witness
10 under penalty of perjury.

11 The parties and their counsel
12 consent to this arrangement and waive
13 any objections to this manner of
14 reporting. Please indicate your
15 agreement by stating your name and
16 your agreement on the record.

17 MR. PLUTA: This is Rob Pluta,
18 I agree.

19 MR. STEPHENS: This is Nicholas
20 Stephens on behalf of the petitioner,
21 agreed.

22 THE REPORTER: Doctor, please
23 raise your right hand.

24 Do you swear or affirm that the
25 testimony you are about to give will

1 be the truth, the whole truth, and
2 nothing but the truth?

3 THE WITNESS: I do.

4 THE REPORTER: Thank you.

5 Counsel, you're all set.

6 CROSS EXAMINATION

7 BY MR. PLUTA:

8 Q. Good morning, Dr. Woods.

9 A. Good morning. Sorry, I have a
10 bit of a cold, so bear with me if I have to
11 turn and sneeze or something.

12 Q. No problem. Probably better
13 that we're doing this remote then.

14 A. Indeed.

15 Q. Do you understand this
16 deposition is being taken in IPR
17 2024-00994?

18 A. I do.

19 Q. Is there any reason you can't
20 testify truthfully here today?

21 A. No.

22 Q. I'm putting in the chat Exhibit
23 1004 which is the Onishi reference. You
24 can take a look at that.

25 A. I have clean copies of all the

1 exhibits on my computer, so if you prefer I
2 can open them here. I'm happy to --

3 Q. Okay, whatever you prefer.

4 A. I can just open them on my
5 computer as needed. It's slightly less
6 overhead.

7 Q. Given that you have a computer
8 open there, you understand you shouldn't be
9 chatting with anybody or looking beyond
10 what we're discussing other than the
11 exhibit?

12 A. Yes.

13 Q. Looking at Onishi, Onishi
14 discloses a primary coil L1, is that your
15 understanding?

16 A. Yes.

17 Q. And primary coil L1 is a power
18 transmission side coil?

19 A. Yes.

20 Q. Onishi also discloses a
21 secondary coil, L2.

22 A. Yes.

23 Q. And secondary coil L2 is a
24 power receiving side coil?

25 A. That's a fair characterization.

1 Q. And Onishi describes that the
2 primary coil L1 may be electromagnetically
3 coupled with the secondary coil L2 to form
4 a power transmission transformer?

5 A. Yes.

6 Q. Do you agree that the primary
7 coil L1 has a characteristic resonant
8 frequency?

9 A. Not by itself. There has to be
10 a capacitance somewhere in the system to
11 perform a resonance.

12 Q. Okay, so the primary coil L1 as
13 disclosed in Onishi, you would not agree
14 that it has a characteristic resonant
15 frequency?

16 A. No, it does have a
17 characteristic resonant frequency, but it
18 doesn't do it by itself. There has to be a
19 capacitor somewhere in the system. It's
20 tacit in Onishi and in all of the other
21 exhibits.

22 But together, the capacitance,
23 which is not shown, and the inductor form a
24 resonant frequency.

25 Q. Okay, so looking at Onishi,

1 figure 2 on the power transmission side,
2 which is I guess the left side of that
3 figure.

4 A. Yes.

5 Q. And you see the primary coil
6 L1?

7 A. Yes.

8 Q. And you see to the left of it
9 the power transmission Section 12?

10 A. Yes.

11 Q. And there's two capacitors
12 there, C1 and C2?

13 A. They're not shown in figure 2.
14 I think it's a later figure.

15 Q. Oh, I'm sorry, yes, you're
16 right. Let's look at figure 5. Okay, so
17 let's look at figure 5 then. You see the
18 power transmission device and the coil L1
19 on the left there?

20 A. Yes.

21 Q. And do you see the power
22 transmission Section 12?

23 A. Yes.

24 Q. And the two capacitors, C1 and
25 C2?

1 A. Yes.

2 Q. So is it your testimony then
3 that primary coil L1 with that capacitance
4 as shown in the power transmission section
5 would form a characteristic resonant
6 frequency?

7 A. Yes.

8 Q. Let's take a look at the right
9 side of figure 5, and you see that
10 secondary coil L2 there?

11 A. Yes.

12 Q. And then you see the power
13 reception Section 42?

14 A. Yes.

15 Q. There's a capacitor CB1 I
16 believe.

17 A. Yes.

18 Q. Do you agree that the secondary
19 coil L2 in combination with that capacitor
20 has a characteristic resonance frequency?

21 A. Yes.

22 Q. Now, will an inductive couple
23 of primary coil L1 and capacitor C1 and C2
24 and secondary coil L2 with capacitor CB1
25 have a characteristic resonant frequency

1 that is different than the characteristic
2 resonant frequent of the primary coil L1
3 along with capacitor C1 and C2?

4 A. You're asking if the coupled
5 system has a different resonance frequency
6 than the transmission section alone with no
7 receiver?

8 Q. Correct.

9 A. Yes.

10 Q. Similarly, will the coupled
11 system have a different characteristic
12 resonant frequency than the characteristic
13 resonant frequency of the coil and the
14 capacitor in the reception side?

15 A. Yes, the two -- yes, the two
16 frequencies -- right, each has a separate
17 resonant frequency stand-alone and when you
18 put them together there will be a resonance
19 that is -- it's neither of those, but
20 it's -- right, it's related. I mean it's
21 usually in between them.

22 Q. And do you agree that the
23 characteristic resonant frequency of the
24 inductive couple is dependent on both of
25 those characteristic resonant frequencies

1 of the --

2 A. Yes.

3 Q. -- the transmission side and
4 the reception side separately?

5 A. I'm sorry, please repeat the
6 question.

7 Q. Sure. Do you agree that the
8 characteristic resonance frequency of the
9 inductive couple system is dependent on
10 both the characteristic resonant frequency
11 of the primary coil L1 resonant frequency
12 and the secondary resonant frequency of
13 coil L2?

14 A. Yes. Among other things.

15 Q. You stated "among other
16 things." What other things would the
17 characteristic resonant frequency of the
18 inductive coupled system depend on?

19 A. The strength of the magnetic
20 flux linkage between L1 and L2, and the
21 effective resistance of the load.

22 Q. Anything else?

23 A. Those are the main things.

24 Q. Take a look at Onishi at
25 paragraph 180. Onishi states, "Figure 4 is

1 a view showing the resonance
2 characteristics" --

3 A. Okay, excuse me, give me a
4 second, please.

5 Q. I'm sorry.

6 A. Onishi paragraph 180 you said?

7 Q. Correct.

8 A. Okay.

9 Q. Onishi states, "Figure 4 is a
10 view showing the resonance characteristics
11 of the induction coil and application of
12 frequencies."

13 A. Yes.

14 Q. And would you agree that
15 Onishi's discussion of this frequency is in
16 the context of the induction coil?

17 MR. STEPHENS: Objection; form.

18 A. I would agree that -- I mean,
19 it's not -- not just of the coil. It's the
20 resonant frequency of the system when the
21 coils are coupled.

22 Q. Well, in paragraph 180 Onishi
23 says it's a view showing the resonance
24 characteristics of the induction coil and
25 applications of frequencies, correct?

1 A. That's what the sentence says,
2 but in the context of the rest of the
3 paragraph and figure 4 it's referring to,
4 it's clear they're talking about the
5 resonance frequency of the entire system.

6 Q. So the next sentence, "The
7 resonance characteristics of the primary
8 coil L1 and the secondary coil L2, when the
9 portable telephone 510 is placed on the
10 charger 500 (cradle; i.e., when load exists
11 with respect to the power transmission
12 device 10) have a symmetrical and broad
13 mountain shape as shown in figure 4." Do
14 you see that?

15 A. Yes.

16 Q. Does figure 4 -- is figure 4
17 representative of the characteristic
18 resonant frequency of either of the
19 inductive coils?

20 A. I believe it's representative
21 of the system when the inductive coils are
22 coupled.

23 Q. Your reading of paragraph 180
24 where it says "the resonance
25 characteristics of the primary coil L1 and

1 the secondary coil L2 have a symmetrical
2 and broad mountain shape as shown in figure
3 4" connotes that it's discussing the
4 coupled system and not the individual --

5 A. Yes. That's clear from the
6 context and from figure 4.

7 Q. In figure 4 the horizontal axis
8 indicates the frequencies, is that right?

9 A. Let me scroll back to figure 4.
10 Give me a sec.

11 Yes, the horizontal axis is
12 frequency.

13 Q. And the vertical axis indicates
14 the resonance peak value?

15 A. Yes. That's what it says.

16 Q. I believe you testified earlier
17 when we were discussing the characteristic
18 resonant frequencies of the coils relative
19 to the system, that they would be
20 different. Is that fair?

21 A. To be clear, I think what I
22 said is stand-alone, each of the
23 transmitter and the receiver would have an
24 individual resonant frequency, and when
25 they are coupled together, they would have

1 a single resonant frequency that could be
2 different from either of the frequencies
3 alone -- of the stand-alone resonant
4 frequencies.

5 Q. Okay, thank you. When
6 combining those resonant frequencies, is
7 the resulting combined frequency a simple
8 sum or is it different?

9 A. It's not a simple sum.

10 Q. So how would you go about --

11 A. Rule of thumb to first order,
12 the resonance frequency of the coupled
13 system is, roughly speaking, the geometric
14 mean of the two individual resonance
15 frequencies.

16 Q. Are you familiar with a
17 phenomenon called "beats"?

18 A. Yes.

19 Q. What does that mean to you?

20 A. I think what you're referring
21 to in this context is what a wave form looks
22 like if there are two separate -- if there
23 are two separate frequencies that -- if you
24 have two wave forms with different
25 frequencies and what you get out of the

1 system is -- if you just add those two way
2 forms together, what you get if you're
3 looking at the sum is a carrier wave that's
4 about -- that is halfway in between the
5 frequency of the individual waves modulated
6 by an amplitude that is the difference
7 between those two frequencies.

8 Q. And the amplitude fluctuates at
9 a beat frequency, is that fair?

10 A. Yes.

11 Q. And that beat frequency is the
12 absolute difference between the original
13 frequencies?

14 A. Yes.

15 Q. Let's take a look at paragraph
16 181 of Onishi.

17 A. Okay, give me a second, please.

18 Okay, I'm at 181.

19 Q. All right, Onishi discloses a
20 power transmission device that's configured
21 to operate in two principal power
22 transmission modes. Is that your
23 recollection?

24 A. There's -- well, I mean, figure
25 4 shows three transmission frequencies.

1 There's at least two states I suppose you
2 could say.

3 Q. Right, a normal mode for
4 charging a battery of a power reception
5 device is one?

6 A. Yes.

7 Q. And there's a power-saving mode
8 for when the battery is fully charged and
9 requires little to no power?

10 A. Yes.

11 Q. Onishi, you alluded to the
12 frequencies F1 through F3, Onishi
13 characterizes frequencies F1 and F2 as
14 normal power transmission frequencies, is
15 that correct?

16 A. I believe Onishi -- let's see
17 what are the actual words. F1 is the basic
18 frequency during power transmission. F2 is
19 frequency used when transmitting to zero.
20 F3 is frequency used in power-saving mode.

21 Q. Turn to paragraph 53 of Onishi.
22 I'll direct your attention to kind of the
23 latter half of that paragraph.

24 A. Okay. I'm still scrolling.

25 Q. Sure.

1 A. Okay, paragraph 53 you said.

2 Q. Yes.

3 A. Okay.

4 Q. Probably about halfway through
5 that paragraph.

6 A. Okay.

7 Q. Onishi describes, "The power
8 saving transmission frequency as set at a
9 frequency apart from the resonance
10 frequency (resonance peak) as compared to
11 with the frequency during normal power
12 transmission." Do you see that?

13 A. Yes, I see that.

14 Q. What does the word "apart" mean
15 to you in the context of paragraph 53 of
16 Onishi?

17 A. I guess you would say -- I
18 guess Onishi would say distinguishable
19 from. I think that's a fair word a POSITA
20 might have used at the time.

21 Q. What's an antonym for
22 "distinguishable from"?

23 A. Indistinguishable from.

24 Q. Would a system that operates at
25 a frequency the same as a characteristic

1 resonance frequency meet limitation 1.7 of
2 the '696 patent?

3 A. Let's go to the limitation.

4 Q. Let me strike that. Let's give
5 it some context and bring up the patent so
6 you have that in front of you.

7 A. Okay, so you are talking about
8 limitation 1 of the limitations of claim 1?

9 Q. Yes. Limitation 1.7 which is
10 characterized as "wherein said driving
11 circuit is configured and operable to
12 produce said oscillating driving voltage at
13 a transition frequency substantially
14 different from said characteristic resonant
15 frequency of said inductive couple."

16 A. Yes, I see that.

17 Q. So my question is, would a
18 system that operates at a frequency the
19 same as a characteristic resonant frequency
20 meet limitation 1.7 of the '696 patent?

21 A. I guess you'd have to be
22 careful about what counts as "the same as"
23 as opposed to "different from" in the eyes
24 of a POSITA. But yes, to the extent that a
25 POSITA would view a frequency as being on

1 resonance, then that would be distinct from
2 a frequency that was not on resonance.

3 Q. Would a system that operates at
4 a frequency substantially the same as a
5 characteristic resonant frequency and meet
6 limitation 1.7?

7 A. Well, the '696 patent never
8 defines what "substantially the same"
9 means. So that's kind of a meaningless
10 question I would say in the context of the
11 patent.

12 Q. Well, the claim language says
13 "substantially different." Agreed?

14 A. Yes.

15 Q. So would a system that operates
16 at a frequency substantially the same as a
17 characteristic resonant frequency meet the
18 limitation of 1.7?

19 A. Well, the patent never says
20 what counts as "substantially different."
21 So I suppose -- I mean, a POSITA wouldn't
22 be able to use the term "substantially
23 different" to necessarily distinguish.

24 Q. Okay, so are you saying that in
25 the context of the '696 patent,

1 "substantially different" could mean
2 substantially the same?

3 A. I'm saying the '696 patent
4 doesn't define -- doesn't describe what the
5 boundary is between "substantially
6 different" and "substantially the same."

7 Q. Would a system that operates at
8 a frequency near the characteristic
9 resonant frequency meet limitation 1.7?

10 A. You're asking me -- it's kind
11 of the same question but using the word
12 "near" instead of "substantially the same"
13 or "substantially different"?

14 Q. Right.

15 A. I mean, same answer.

16 Q. You may want to refer to your
17 declaration. I'm just going to point you
18 to paragraph 68.

19 A. Okay.

20 Q. Which Exhibit 1003.

21 A. I'm opening that. Which
22 paragraph?

23 Q. 68.

24 A. Okay.

25 Q. It's your contention there that

1 frequency F3 of Onishi lies in a near
2 linear region of the frequency response
3 curve.

4 A. Sorry, I'm still scrolling.

5 Q. Sure, sorry.

6 A. 68 you said. Is that right?

7 Paragraph 68?

8 Q. 6-8, yes.

9 A. Okay, I'm there.

10 Q. Is it your contention that
11 frequency F3 of Onishi lies in a near
12 linear region of the frequency response
13 curve?

14 A. Let's see what I said there.

15 Yes, that's what I said.

16 Q. Go back to Onishi.

17 A. Okay.

18 Q. And I'll point you to paragraph
19 173.

20 A. Okay, I'm looking at it.

21 Q. Onishi describes power-saving
22 mode here as "a mode which mainly enables
23 recharging the battery after the battery
24 has been fully charged while reducing power
25 consumption (power-saving) by suppressing

1 unnecessary power transmission."

2 A. Yes.

3 Q. Is that your understanding of
4 Onishi's power-saving mode?

5 A. Yes.

6 Q. Take a look at paragraph 178 of
7 Onishi.

8 A. Okay.

9 Q. Onishi here describes
10 power-saving mode frequency F3 as
11 corresponding to a region in which little
12 to no power is transmitted to the receiver.
13 Do you agree with that?

14 A. Yes. Paragraph 178 -- yeah,
15 it's talking about the system when it's
16 oscillating at frequency F3 I believe.

17 Q. Does Onishi provide any
18 quantitative measure of the value of
19 frequency F1?

20 A. Quantitative measure. I mean,
21 there's not a formula -- I mean, yeah,
22 there's no number associated with it.

23 Q. Does Onishi provide any
24 quantitative measure of the value of F1
25 relative to F0 for resonance frequency?

1 A. The closest we get to
2 quantitative is about the same as in the
3 '696 patent where we have what looks to be
4 a figure where you have some frequencies
5 that are -- they look to be different from
6 the peak. In both those documents that's
7 what we get.

8 Q. Okay, so the answer is no,
9 Onishi doesn't provide any quantitative
10 measure of the value of F1 relative to F0?

11 A. I would say Onishi is just as
12 quantitative or not as '696.

13 Q. Similarly, Onishi -- does
14 Onishi provide any quantitative measure of
15 the value of F2?

16 A. Same answer.

17 Q. What about any quantitative
18 measure of the value of F3?

19 A. Same answer.

20 Q. And similarly, Onishi doesn't
21 provide any quantitative measure of the
22 value of F3 relative to the resonant
23 frequency?

24 A. Well, I guess Onishi defines it
25 in several places where there's -- he

1 defines it -- well, we know that at F3 it's
2 in power-saving mode. And in paragraph,
3 was it -- right, in paragraph 178 it says a
4 small amount of power is transmitted.

5 Q. Does Onishi mention any
6 intervening frequencies other than those
7 identified in figure 4 as frequencies F0 to
8 F3?

9 A. I don't remember offhand if
10 he -- if any point in the patent mentions
11 intervening frequency. Would you like me
12 to check?

13 Q. Yes.

14 A. Okay. I don't think I discuss
15 that in my report.

16 Q. You do not.

17 A. So you want to know if Onishi
18 ever mentions some frequency that's not F1,
19 F2 or F3. Is that the question you're
20 asking?

21 Q. Maybe I can ask a little
22 narrower question. Let's try that.

23 Does figure 4 disclose any
24 other frequencies than F0, F1, F2 and F3?

25 MR. STEPHENS: Objection; form.

1 A. Figure 4 just lists those four
2 frequencies.

3 Q. Are those four frequencies
4 sufficient to perform regulation of the
5 output voltage of the system?

6 A. Which output voltage are you
7 talking about?

8 Q. Well, would Onishi's system
9 have an output voltage the way it's
10 described?

11 A. Output to the battery on the
12 receiver side?

13 Q. Correct.

14 A. Yeah, it would be a non-zero
15 voltage or current supplied to the battery.

16 Q. So are the disclosed
17 frequencies in Onishi, those I guess three
18 frequencies, F1, F2, F3, are those
19 sufficient to regulate the output voltage
20 of the system?

21 MR. STEPHENS: Objection; form.

22 A. Define "regulate."

23 Q. Sure, like increasing or
24 decreasing the transmission frequency when
25 the signal is detected.

1 A. Oh, okay. So you're saying
2 increasing or decreasing the frequency in
3 order to change the amount of power going
4 through the inductive couple?

5 Q. You said it better than I
6 could. Yes.

7 A. Oh, so, right, does Onishi say
8 you need to change the frequency to
9 regulate the power transfer. I mean, I
10 would say yes, it does. For sure F1 and F3
11 are chosen to change the amount of power
12 delivered to the system.

13 Q. Okay, and the disclosure of F1,
14 F2, F3, are those three disclosed
15 frequencies sufficient to increase or
16 decrease the frequency in order to change
17 the amount of power going through the
18 inductive couple?

19 A. Let's see. Are those
20 sufficient. I guess define "sufficient" or
21 what do you mean by "regulate"?

22 Q. Regulate I guess in the way
23 that you defined the term, at least the way
24 I meant it. Increasing or decreasing the
25 frequency in order to change the amount of

1 power going into the inductive couple.

2 A. You're asking if those three
3 frequencies are sufficient. Yeah, I would
4 say so.

5 Q. With those three frequencies,
6 what kind of accuracy would you get? If
7 you know.

8 A. You can't tell from this
9 figure.

10 Q. Would having a larger number of
11 points be better or worse for --

12 A. You can't say.

13 MR. STEPHENS: Objection; form.

14 A. I don't think you could tell.

15 Q. Take a look at the Baarman
16 reference.

17 A. '392?

18 Q. Yes, Baarman '392, which is
19 Exhibit 1008.

20 A. I need to open that one. Give
21 me a second, please.

22 Okay. I'm looking at Baarman
23 '392.

24 Q. I'll direct your attention to
25 paragraph 38.

1 A. Okay.

2 Q. At paragraph 38, Baarman '392
3 describes the general operation of its
4 inverter as "in the range between frequency
5 A and frequency B where frequency B is
6 somewhat less than the resonant frequency."
7 Do you see that?

8 A. Yes.

9 Q. I believe -- is it your opinion
10 that Baarman '392's operating frequencies,
11 for example, the frequency between A and B,
12 fall within the scope of being
13 substantially different than the
14 characteristic resonance frequency in
15 inductive couple?

16 A. I think the particular sentence
17 in Baarman that you're looking at, I
18 believe he probably meant frequency B is
19 somewhat more than the resonant frequency
20 based on the relevant figure. Which was,
21 what, figure 3 I believe. Yes.

22 Q. Where do you say that in your
23 report?

24 A. Let's see. I think -- yes, I
25 think -- okay. In my report on page 92,

1 paragraph 127, I quote the same paragraph
2 that you just read, paragraph 38, from
3 Baarman.

4 Q. Let me stop you there. I'm not
5 with you. You said --

6 A. Sorry.

7 Q. -- paragraph 127?

8 A. Paragraph 127 of my
9 declaration, yes. Page 94.

10 Q. Okay, great, I'm with you.
11 Okay, please.

12 A. Okay. So -- right, so I'm
13 citing the same quote that you just read to
14 me with the following sentence or two which
15 provide additional context. So right, I
16 guess I can read you the whole citation, or
17 the whole paragraph -- or what I cited.

18 Let me slow down and I'll just
19 focus on the most relevant part rather than
20 attempting to read it all rapidly.

21 Okay, so the quote says
22 "However, even if the inverter 10 is not
23 operating at resonance, significant power
24 transfer can occur when the inverter is
25 operating off resonance. Generally, the

1 inverter 10 is operated between frequency A
2 and B." And the next sentence is the one
3 that you read to me, "Frequency B is
4 somewhat less than the resonance frequency.
5 Between frequency A and B the power
6 transfer curve can be piecewise linearized
7 by a software lookup table located in the
8 controller 20."

9 So you were asking me where in
10 my report I discuss this figure, and
11 frequency B. So that's where that happens.

12 Q. Right, but I was confused
13 because I thought I heard you testify that
14 you think frequency B as described by
15 Baarman '392 should have been somewhat more
16 than the resonant frequency.

17 A. Yes. What I think Baarman --
18 right, what I think Baarman '392 means in
19 this case is that the power transfer at
20 frequency B is somewhat less than the power
21 transfer would be at the resonant
22 frequency. That's pretty clear from the
23 context of the entire paragraph that I just
24 read.

25 Q. Okay, so earlier -- I'm just

1 looking at the transcript. You say, "I
2 believe you meant frequency B is somewhat
3 more than the resonant frequency based on
4 the relevant figure." Was that --

5 A. Well, let me be more precise.
6 What I intend to say is Baarman says that
7 frequency B, if you're at frequency B, you
8 are still -- you're transferring less power
9 than you would at the resonant frequency.
10 That implies, which is what I said before,
11 that frequency B, the magnitude of --
12 sorry, the value of frequency B is somewhat
13 higher than the resonance frequency.

14 We know that -- yeah, so what I
15 meant to say was the frequency is somewhat
16 higher than the resonant frequency.

17 Q. Okay, now I understand. The
18 magnitude of the frequency on the X axis is
19 more than the magnitude of the frequency at
20 resonance.

21 A. Yeah, the reason is -- right,
22 you can see from the sentence before,
23 Baarman is clearly talking about a system
24 that's not operating at resonance. If
25 Baarman meant that frequency B was somewhat

1 less than the resonant frequency, than the
2 range between frequency A and frequency B
3 would encompass the resonant frequency.

4 So we know that frequency B
5 cannot lie at or beyond the resonant
6 frequency. So that's what the preceding
7 sentence says.

8 And then the following
9 sentence, after the sentence that says
10 "frequency B is somewhat less than the
11 resonant frequency," the following sentence
12 clarifies that between frequency A and B
13 the power transfer curve can be piecewise
14 linearized by a lookup table. If frequency
15 B was on the opposite side of the peak from
16 frequency A, then it would not be useful to
17 piecewise linearize the curve.

18 Q. Does Baarman 392 quantify the
19 operating frequency of frequency B?

20 A. Quantify. We know it's not on
21 resonance.

22 Q. What about does Baarman '392
23 quantify the operating frequency of
24 frequency A?

25 A. We know from the figure it's

1 farther away from resonance than is
2 frequency B.

3 Q. And other than it being farther
4 away from frequency B, does Baarman '392
5 quantify the difference between those two
6 operating frequencies B and A?

7 A. Quantify, he doesn't present an
8 equation. This is -- the figure 3 is
9 describing the essential elements, but if
10 you wanted the actual equation of that
11 curve, it would be complicated.

12 Q. Is it your opinion that
13 frequencies that are somewhat less than the
14 resonant frequency are substantially
15 different than the resonant frequency?

16 A. I don't know about in general,
17 but I would say frequency B is -- we know
18 it's not on resonance. Baarman says so.
19 So I would say that makes it substantially
20 different.

21 Q. And the same paragraph but
22 similar concept. Baarman '392 states at
23 paragraph 38, Between frequency A and
24 frequency B the power transfer curve can be
25 piecewise linearized by a software lookup

1 table located in controller 20."

2 A. Yes.

3 Q. Do you have an understanding --
4 what is a piecewise linear function?

5 A. That basically means if you
6 have a -- right, if you have a curve, you
7 can break it down into -- you can
8 approximate it more accurately by treating
9 it as a series of two or more line
10 segments.

11 (Whereupon, an off-the-record
12 discussion was held.)

13 Q. I believe you finished your
14 answer, your explanation of what piecewise
15 linear function is.

16 A. Okay.

17 Q. So if a power transfer curve
18 has to be piecewise linearized by a
19 software lookup table, transfer curve
20 probably wasn't very linear to begin with,
21 is that fair?

22 A. Not necessarily. I mean,
23 looking at figure 3 from Baarman, it looks
24 pretty linear in the region that he showed.

25 Q. But why -- I'm sorry.

1 A. No, go ahead.

2 Q. So why would Baarman '392
3 perform a piecewise linearization on the
4 system?

5 A. I could think of a few reasons.

6 Q. If it's already linear, why
7 would you linearize it?

8 A. Well, no curve is ever fully
9 linear, so whether a curve is linear or not
10 is -- it's a matter of the context. So
11 your question -- please repeat, I'm sorry.

12 Q. If it's your contention that
13 the curve in figure 3 is already linear, or
14 near linear, why would Baarman '392 perform
15 a piecewise linearization on that curve?

16 A. I could think of a few reasons.
17 Baarman doesn't discuss them.

18 Q. Why would someone do that?

19 A. One reason might be to get a
20 quantitative number of power transfer
21 efficiency. It might also be useful for
22 tightening a control loop.

23 Q. What do you mean by "useful for
24 tightening a control loop"?

25 A. I mean you could get a higher

1 performance -- higher performance control
2 of a system if you can -- the more
3 accurately you can model a system as a
4 linear system, the more accurately you
5 can -- the higher the performance of the
6 control might be.

7 Q. Okay, so in a situation where
8 you might only have, I don't know, two data
9 points, if you linearize, you perform a
10 piecewise linearized function, it would
11 simulate that you have more data points?

12 A. So sort of an interpolation.
13 Yes. That's fair.

14 Q. The other reason you suggested
15 that somebody might perform this
16 linearization would be you get a
17 quantitative number of power transfer
18 efficiency. What did you mean by that?

19 A. Well, looking at figure 3,
20 there's a quantitative scale of power
21 transfer efficiency. So it may be that the
22 system is configured to have a feature
23 where it knows what its resonant frequency
24 is -- it knows where it is on the curve.
25 And so then it can provide an accurate

1 answer of power transfer efficiency for the
2 user. Could be, for instance, a user
3 feature.

4 Q. Okay, in figure 3 that we were
5 just referencing in Baarman '392, what's
6 represented by the Y axis in the figure?

7 A. He's showing it as power
8 transfer efficiency.

9 Q. How is power transfer
10 efficiency measured in figure 3? Or maybe
11 a better question would be what unit is
12 power transfer efficiency measured in?

13 A. I don't remember how Baarman
14 defines power transfer efficiency. Would
15 you like me to look it up?

16 Q. Sure. I would suggest, is it a
17 percentage?

18 A. Probably -- yeah, it's a
19 percentage of something. I don't know if
20 he's talking about end-to-end power
21 transfer efficiency from wall plug to final
22 battery or just transfer efficiency across
23 the inductive couple. Right, I don't know
24 how -- I don't know what he's defining.
25 But in general, efficiencies are thought of

1 as percent.

2 Q. Do you recall whether Baarman
3 '392 describes how -- or what kind of
4 transfer efficiency he's talking about?

5 A. I don't remember. Would you
6 like me to look it up?

7 Q. Yes.

8 A. Give me a few moments, please.

9 Let's see, so I don't see the
10 word "efficiency" in Baarman. He talks
11 about power transfer.

12 Okay, so yeah, in paragraph 27
13 of Baarman, on page 10, he says that figure
14 3 is a power transfer curve between a
15 primary coil and secondary coil. So he's
16 talking about just the efficiency of power
17 transfer from the primary coil to the
18 secondary coil. He's not including other
19 effects like -- other elements in the
20 system. This is just coil-to-coil power
21 transmission efficiency.

22 Q. Okay, thank you. I don't have
23 any further questions at this time.

24 MR. STEPHENS: No further
25 questions.

(Whereupon, at 11:55 a.m. the
cross examination of this witness was
concluded.)

° ° ° °

D E C L A R A T I O N

I hereby certify that having been
first duly sworn to testify to the truth, I
gave the above testimony.

I FURTHER CERTIFY that the foregoing
transcript is a true and correct transcript
of the testimony given by me at the time
and place specified hereinbefore.

GARY L. WOODS, Ph.D.

Subscribed and sworn to before me

this _____ day of _____ 20____.

NOTARY PUBLIC

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

E X H I B I T S

WOODS EXHIBITS

(None)

I N D E X

EXAMINATION BY	PAGE
Mr. Pluta	4

INFORMATION AND/OR DOCUMENTS REQUESTED

(None)

C E R T I F I C A T E

STATE OF NEW YORK)
 : SS.:
COUNTY OF DELAWARE)

I, SUZANNE PASTOR, a Notary Public
for and within the State of New York, do
hereby certify:

That the witness whose examination is
hereinbefore set forth was duly sworn and
that such examination is a true record of
the testimony given by that witness.

I further certify that I am not
related to any of the parties to this
action by blood or by marriage and that I
am in no way interested in the outcome of
this matter.

IN WITNESS WHEREOF, I have hereunto
set my hand this day, February 20, 2025.

Suzanne Pastor

SUZANNE PASTOR

1	3	6	
1 18:8 1.7 18:1,9,20 19:6,18 20:9 10 12:12 29:22 30:1 38:13 1003 20:20 1004 4:23 1008 27:19 11:55 39:1 12 7:9,22 127 29:1,7,8 173 21:19 178 22:6,14 24:3 180 10:25 11:6, 22 12:23 181 15:16,18	3 28:21 33:8 34:23 35:13 36:19 37:4, 10 38:14 38 27:25 28:2 29:2 33:23 392 27:17,18,23 28:2 30:15, 18 32:18,22 33:4,22 35:2,14 37:5 38:3 392's 28:10	6-8 21:8 68 20:18,23 21:6,7 696 18:2,20 19:7,25 20:3 23:3,12	affirm 3:24 agree 3:18 6:6,13 8:18 9:22 10:7 11:14, 18 22:13 agreed 3:21 19:13 agreement 3:15,16 ahead 35:1 alluded 16:11 amount 24:4 26:3, 11,17,25 amplitude 15:6,8 answer 20:15 23:8, 16,19 34:14 37:1 antonym 17:21 anybody 5:9 apart 17:9,14 application 11:11 applications 11:25 approximate 34:8 arrangement 3:12 asking 9:4 20:10 24:20 27:2 30:9 associated 22:22 attempting 29:20
2	4	9	
2 7:1,13 20 30:8 34:1 2024-00994 4:17 27 38:12	4 10:25 11:9 12:3,13,16 13:3,6,7,9 15:25 24:7, 23 25:1 42 8:13	92 28:25 94 29:9	amount 24:4 26:3, 11,17,25 amplitude 15:6,8 answer 20:15 23:8, 16,19 34:14 37:1 antonym 17:21 anybody 5:9 apart 17:9,14 application 11:11 applications 11:25 approximate 34:8 arrangement 3:12 asking 9:4 20:10 24:20 27:2 30:9 associated 22:22 attempting 29:20
	5	A	
	5 7:16,17 8:9 500 12:10 510 12:9 53 16:21 17:1, 15	a.m. 39:1 able 19:22 absolute 15:12 accuracy 27:6 accurate 36:25 accurately 34:8 36:3,4 acknowledge 3:3,7 across 37:22 actual 16:17 33:10 add 15:1 additional 29:15 administered 3:8	affirm 3:24 agree 3:18 6:6,13 8:18 9:22 10:7 11:14, 18 22:13 agreed 3:21 19:13 agreement 3:15,16 ahead 35:1 alluded 16:11 amount 24:4 26:3, 11,17,25 amplitude 15:6,8 answer 20:15 23:8, 16,19 34:14 37:1 antonym 17:21 anybody 5:9 apart 17:9,14 application 11:11 applications 11:25 approximate 34:8 arrangement 3:12 asking 9:4 20:10 24:20 27:2 30:9 associated 22:22 attempting 29:20

attention 16:22 27:24	18,21 31:2 34:13	characteristi c 6:7,14,17 8:5,20,25 9:1,11,12, 23,25 10:8, 10,17 12:17 13:17 17:25 18:14,19 19:5,17 20:8 28:14	clarifies 32:12
attorneys 3:2	better 4:12 26:5 27:11 37:11		clean 4:25
axis 13:7,11,13 31:18 37:6	bit 4:10		clear 12:4 13:5,21 30:22
B	boundary 20:5	characteristi cs 11:2,10,24 12:7,25	clearly 31:23
Baerman 27:15,18,22 28:2,10,17 29:3 30:15, 17,18 31:6, 23,25 32:18, 22 33:4,18, 22 34:23 35:2,14,17 37:5,13 38:2,10,13	break 34:7	characteriz ion 5:25	closest 23:1
	bring 18:5	characterized 18:10	coil 5:14,17,18, 21,23,24 6:2,3,7,12 7:5,18 8:3, 10,19,23,24 9:2,13 10:11,13 11:11,16,19, 24 12:8,25 13:1 38:15, 17,18
	broad 12:12 13:2	characterizes 16:13	coil-to-coil 38:20
	C	charged 16:8 21:24	coils 11:21 12:19, 21 13:18
	C1 7:12,24 8:23 9:3	charger 12:10	cold 4:10
	C2 7:12,25 8:23 9:3	charging 16:4	combination 8:19
back 13:9 21:16	called 14:17	chat 4:22	combined 14:7
based 28:20 31:3	capacitance 6:10,22 8:3	chatting 5:9	combining 14:6
basic 16:17	capacitor 6:19 8:15, 19,23,24 9:3,14	check 24:12	compared 17:10
basically 34:5	capacitors 7:11,24	chosen 26:11	complicated 33:11
battery 16:4,8 21:23 25:11,15 37:22	careful 18:22	circuit 18:11	computer 5:1,5,7
bear 4:10	carrier 15:3	citation 29:16	concept 33:22
beat 15:9,11	case 30:19	cited 29:17	concluded 39:3
beats 14:17	CB1 8:15,24	citing 29:13	
begin 34:20	change 26:3,8,11, 16,25	claim 18:8 19:12	
behalf 3:20			
believe 8:16 12:20 13:16 16:16 22:16 28:9,			

configured 15:20 18:11 36:22 confused 30:12 connotes 13:3 consent 3:12 consumption 21:25 contention 20:25 21:10 35:12 context 11:16 12:2 13:6 14:21 17:15 18:5 19:10,25 29:15 30:23 35:10 control 35:22,24 36:1,6 controller 30:8 34:1 copies 4:25 correct 9:8 11:7,25 16:15 25:13 corresponding 22:11 counsel 3:11 4:5 counts 18:22 19:20 couple 8:22 9:24 10:9 18:15 26:4,18 27:1 28:15 37:23 coupled 6:3 9:4,10 10:18 11:21 12:22 13:4, 25 14:12	cradle 12:10 cross 4:6 39:2 current 25:15 curve 21:3,13 30:6 32:13,17 33:11,24 34:6,17,19 35:8,9,13,15 36:24 38:14 D data 36:8,11 declaration 20:17 29:9 decrease 26:16 decreasing 25:24 26:2, 24 define 20:4 25:22 26:20 defined 26:23 defines 19:8 23:24 24:1 37:14 defining 37:24 delivered 26:12 depend 10:18 dependent 9:24 10:9 deposition 3:3,4,6 4:16 describe 20:4 described 25:10 30:14	describes 6:1 17:7 21:21 22:9 28:3 38:3 describing 33:9 detected 25:25 device 7:18 12:12 15:20 16:5 difference 15:6,12 33:5 different 9:1,5,11 13:20 14:2, 8,24 18:14, 23 19:13,20, 23 20:1,6,13 23:5 28:13 33:15,20 direct 16:22 27:24 disclose 24:23 disclosed 6:13 25:16 26:14 discloses 5:14,20 15:19 disclosure 26:13 discuss 24:14 30:10 35:17 discussing 5:10 13:3,17 discussion 11:15 34:12 distinct 19:1 distinguish 19:23 distinguishable 17:18,22	Doctor 3:22 documents 23:6 doing 4:13 driving 18:10,12 E earlier 13:16 30:25 effective 10:21 effects 38:19 efficiencies 37:25 efficiency 35:21 36:18, 21 37:1,8, 10,12,14,21, 22 38:4,10, 16,21 either 12:18 14:2 electromagnet ically 6:2 elements 33:9 38:19 enables 21:22 encompass 32:3 end-to-end 37:20 entire 12:5 30:23 equation 33:8,10 essential 33:9 examination 4:6 39:2
---	--	--	---

excuse 11:3 exhibit 4:22 5:11 20:20 27:19 exhibits 5:1 6:21 exists 12:10 explanation 34:14 extent 18:24 eyes 18:23	familiar 14:16 farther 33:1,3 feature 36:22 37:3 figure 7:1,3,13,14, 16,17 8:9 10:25 11:9 12:3,13,16 13:2,6,7,9 15:24 23:4 24:7,23 25:1 27:9 28:20, 21 30:10 31:4 32:25 33:8 34:23 35:13 36:19 37:4,6,10 38:13 final 37:21 finished 34:13 first 14:11 fluctuates 15:8 flux 10:20 focus 29:19 following 29:14 32:8, 11 form 6:3,23 8:5 11:17 14:21 24:25 25:21 27:13 forms 14:24 15:2 formula 22:21 four 25:1,3	frequencies 9:16,25 11:12,25 13:8,18 14:2,4,6,15, 23,25 15:7, 13,25 16:12, 13,14 23:4 24:6,7,24 25:2,3,17,18 26:15 27:3,5 28:10 33:6, 13 frequency 6:8,15,17,24 8:6,20,25 9:5,12,13, 17,23 10:8, 10,11,12,17 11:15,20 12:5,18 13:12,24 14:1,7,12 15:5,9,11 16:18,19,20 17:8,9,10, 11,25 18:1, 13,15,18,19, 25 19:2,4,5, 16,17 20:8,9 21:1,2,11,12 22:10,16,19, 25 23:23 24:11,18 25:24 26:2, 8,16,25 28:4,5,6,11, 14,18,19 30:1,3,4,5, 11,14,16,20, 22 31:2,3,7, 9,11,12,13, 15,16,18,19, 25 32:1,2,3, 4,6,10,11, 12,14,16,19, 23,24 33:2, 4,14,15,17, 23,24 36:23	frequent 9:2 front 18:6 fully 16:8 21:24 35:8 function 34:4,15 36:10
F			G
F0 22:25 23:10 24:7,24 F1 16:12,13,17 22:19,24 23:10 24:18, 24 25:18 26:10,13 F2 16:13,18 23:15 24:19, 24 25:18 26:14 F3 16:12,20 21:1,11 22:10,16 23:18,22 24:1,8,19,24 25:18 26:10, 14 fair 5:25 13:20 15:9 17:19 34:21 36:13 fall 28:12			general 28:3 33:16 37:25 Generally 29:25 geometric 14:13 give 3:25 11:3 13:10 15:17 18:4 27:20 38:8 Given 5:7 going 20:17 26:3, 17 27:1 Good 3:1 4:8,9 great 29:10 guess 7:2 17:17,18 18:21 23:24 25:17 26:20, 22 29:16
			H
			half 16:23 halfway 15:4 17:4

hand 3:23	12:19,21 18:15 26:4,	language 19:12	look 4:24 7:16,17
happy 5:2	18 27:1 28:15 37:23	larger 27:10	8:8 10:24 15:15 22:6
heard 30:13	inductor 6:23	left 7:2,8,19	23:5 27:15 37:15 38:6
held 34:12	instance 37:2	lie 32:5	looking 5:9,13 6:25
higher 31:13,16 35:25 36:1,5	intend 31:6	lies 21:1,11	15:3 21:20 27:22 28:17
horizontal 13:7,11	interpolation 36:12	lieu 3:8	31:1 34:23 36:19
I	intervening 24:6,11	limitation 18:1,3,8,9, 20 19:6,18 20:9	looks 14:21 23:3 34:23
i.e. 12:10	inverter 28:4 29:22, 24 30:1	limitations 18:8	lookup 30:7 32:14 33:25 34:19
identified 24:7	IPR 4:16	line 34:9	loop 35:22,24
implies 31:10	K	linear 21:2,12 34:4,15,20, 24 35:6,9, 13,14 36:4	M
including 38:18	kind 16:22 19:9 20:10 27:6 38:3	linearization 35:3,15 36:16	magnetic 10:19
increase 26:15	know 24:1,17 27:7 31:14 32:4, 20,25 33:16, 17 36:8 37:19,23,24	linearize 32:17 35:7 36:9	magnitude 31:11,18,19
increasing 25:23 26:2, 24		linearized 30:6 32:14 33:25 34:18 36:10	main 10:23
Indeed 4:14		linkage 10:20	makes 33:19
indicate 3:14		lists 25:1	manner 3:13
indicates 13:8,13		little 16:9 22:11 24:21	matter 35:10
Indistinguishable 17:23	L1 5:14,17 6:2, 7,12 7:6,18 8:3,23 9:2 10:11,20 12:8,25	load 10:21 12:10	mean 9:20 11:18 14:14,19 15:24 17:14 19:21 20:1, 15 22:20,21 26:9,21 34:22 35:23, 25 36:18
individual 13:4,24 14:14 15:5	L2 5:21,23 6:3 8:10,19,24 10:13,20 12:8 13:1	located 30:7 34:1	meaningless 19:9
induction 11:11,16,24			
inductive 8:22 9:24 10:9,18			

means 19:9 30:18 34:5	needed 5:5	36:7 37:4 38:12,22	opposed 18:23
meant 26:24 28:18 31:2,15,25	never 19:7,19	one 16:5 27:20 30:2 35:19	opposite 32:15
measure 22:18,20,24 23:10,14,18, 21	Nicholas 3:19	Onishi 4:23 5:13,20 6:1,13,20,25 10:24,25 11:6,9,22 15:16,19 16:11,12,16, 21 17:7,16, 18 21:1,11, 16,21 22:7, 9,17,23 23:9,11,13, 14,20,24 24:5,17 25:17 26:7	order 14:11 26:3, 16,25
measured 37:10,12	non-zero 25:14		original 15:12
meet 18:1,20 19:5,17 20:9	normal 16:3,14 17:11		oscillating 18:12 22:16
mention 24:5	number 22:22 27:10 35:20 36:17		output 25:5,6,9,11, 19
mentions 24:10,18	O		overhead 5:6
mode 16:3,7,20 21:22 22:4, 10 24:2	oath 3:8	Onishi's 11:15 22:4 25:8	P
model 36:3	Objection 11:17 24:25 25:21 27:13		page 28:25 29:9 38:13
modes 15:22	objections 3:13	open 5:2,4,8 27:20	paragraph 10:25 11:6, 22 12:3,23 15:15 16:21, 23 17:1,5,15 20:18,22 21:7,18 22:6,14 24:2,3 27:25 28:2 29:1,2, 7,8,17 30:23 33:21,23 38:12
modulated 15:5	occur 29:24	opening 20:21	part 29:19
moments 38:8	off-the- record 34:11	operable 18:11	participating 3:2
morning 3:1 4:8,9	offhand 24:9	operate 15:21	particular 28:16
mountain 12:13 13:2	okay 5:3 6:12,25 7:16 11:3,8 14:5 15:17, 18 16:24 17:1,3,6 18:7 19:24 20:19,24 21:9,17,20 22:8 23:8 24:14 26:1, 13 27:22 28:1,25 29:10,11,12, 21 30:25 31:17 34:16	operated 30:1	parties 3:11
N		operates 17:24 18:18 19:3,15 20:7	patent 18:2,5,20 19:7,11,19, 25 20:3 23:3
name 3:15		operating 28:10 29:23, 25 31:24 32:19,23 33:6	
narrower 24:22		operation 28:3	
necessarily 19:23 34:22		opinion 28:9 33:12	
need 26:8 27:20			

24:10 peak 13:14 17:10 23:6 32:15 penalty 3:10 percent 38:1 percentage 37:17,19 perform 6:11 25:4 35:3,14 36:9,15 performance 36:1,5 perjury 3:10 person 3:9 petitioner 3:20 phenomenon 14:17 physically 3:4 piecewise 30:6 32:13, 17 33:25 34:4,14,18 35:3,15 36:10 place 3:9 places 23:25 please 3:14,22 10:5 11:4 15:17 27:21 29:11 35:11 38:8 plug 37:21 Pluta 3:17 4:7 point 20:17 21:18	24:10 points 27:11 36:9, 11 portable 12:9 POSITA 17:19 18:24, 25 19:21 power 5:17,24 6:4 7:1,9,18,21 8:4,12 12:11 15:20,21 16:4,9,14,18 17:7,11 21:24 22:1, 12 24:4 26:3,9,11,17 27:1 29:23 30:5,19,20 31:8 32:13 33:24 34:17 35:20 36:17, 20 37:1,7,9, 12,14,20 38:11,14,16, 20 power-saving 16:7,20 21:21,25 22:4,10 24:2 preceding 32:6 precise 31:5 prefer 5:1,3 present 3:4 33:7 pretty 30:22 34:24 primary 5:14,17 6:2, 6,12 7:5 8:3,23 9:2 10:11 12:7,	25 38:15,17 principal 15:21 probably 4:12 17:4 28:18 34:20 37:18 problem 4:12 produce 18:12 provide 22:17,23 23:9,14,21 29:15 36:25 put 9:18 putting 4:22 Q quantify 32:18,20,23 33:5,7 quantitative 22:18,20,24 23:2,9,12, 14,17,21 35:20 36:17, 20 question 10:6 18:17 19:10 20:11 24:19,22 35:11 37:11 questions 38:23,25 quote 29:1,13,21 R raise 3:23 range 28:4 32:2	rapidly 29:20 read 29:2,13,16, 20 30:3,24 reading 12:23 reason 4:19 31:21 35:19 36:14 reasons 35:5,16 recall 38:2 receiver 9:7 13:23 22:12 25:12 receiving 5:24 reception 8:13 9:14 10:4 16:4 recharging 21:23 recollection 15:23 record 3:16 reducing 21:24 refer 20:16 reference 4:23 27:16 referencing 37:5 referring 12:3 14:20 region 21:2,12 22:11 34:24 regulate 25:19,22 26:9,21,22 regulation 25:4
---	--	--	--

related 9:20	resonant 6:7,14,17,24	saying 19:24 20:3 26:1	separate 9:16 14:22, 23
relative 13:18 22:25 23:10,22	8:5,25 9:2, 12,13,17,23, 25 10:10,11, 12,17 11:20	says 11:23 12:1, 24 13:15 19:12,19 24:3 29:21 31:6 32:7,9 33:18 38:13	separately 10:4
relevant 28:20 29:19 31:4	12:18 13:18, 24 14:1,3,6 18:14,19 19:5,17 20:9	scale 36:20	series 34:9
remember 24:9 37:13 38:5	23:22 28:6, 19 30:16,21 31:3,9,16 32:1,3,5,11 33:14,15 36:23	scope 28:12	set 4:5 17:8
remote 4:13	respect 12:11	scroll 13:9	several 23:25
remotely 3:6	response 21:2,12	scrolling 16:24 21:4	shape 12:13 13:2
repeat 10:5 35:11	rest 12:2	sec 13:10	showed 34:24
report 24:15 28:23, 25 30:10	resulting 14:7	second 11:4 15:17 27:21	showing 11:1,10,23 37:7
REPORTER 3:1,22 4:4	right 3:23 7:16 8:8 9:16,20 13:8 15:19 16:3 20:14 21:6 24:3 26:7 29:12, 15 30:12,18 31:21 34:6 37:23	secondary 5:21,23 6:3 8:10,18,24 10:12 12:8 13:1 38:15, 18	shown 6:23 7:13 8:4 12:13 13:2
reporting 3:5,14	Rob 3:17	section 7:9,22 8:4, 13 9:6	shows 15:25
representativ e 12:17,20	room 3:5	see 7:5,8,17,21 8:9,12 12:14 16:16 17:12, 13 18:16 21:14 26:19 28:7,24 31:22 38:9	side 5:18,24 7:1, 2 8:9 9:14 10:3,4 25:12 32:15
represented 37:6	roughly 14:13	segments 34:10	signal 25:25
requires 16:9	Rule 14:11	sentence 12:1,6 28:16 29:14 30:2 31:22 32:7, 9,11	significant 29:23
resistance 10:21	saving 17:8		similar 33:22
resonance 6:11 8:20 9:5,18 10:8 11:1,10,23 12:5,7,24 13:14 14:12, 14 17:9,10 18:1 19:1,2 22:25 28:14 29:23,25 30:4 31:13, 20,24 32:21 33:1,18	S		similarly 9:10 23:13, 20
			simple 14:7,9
			simulate 36:11
			single 14:1
			situation 36:7

slightly 5:5	suggest 37:16	talking 12:4 18:7	transfer 26:9 29:24
slow 29:18	suggested 36:14	22:15 25:7	30:6,19,21
small 24:4	sum 14:8,9 15:3	31:23 37:20	32:13 33:24
sneeze 4:11	supplied 25:15	38:4,16	34:17,19
software 30:7 33:25	suppose 16:1 19:21	talks 38:10	35:20 36:17,
34:19	suppressing 21:25	telephone 12:9	21 37:1,8,9,
sort 36:12	sure 10:7 16:25	tell 27:8,14	12,14,21,22
speaking 14:13	21:5 25:23	term 19:22 26:23	38:4,11,14,
stand-alone 9:17 13:22	26:10 37:16	testified 13:16	17
14:3	swear 3:24	testify 4:20 30:13	transferring 31:8
stated 10:15	symmetrical 12:12 13:1	testimony 3:25 8:2	transformer 6:4
states 10:25 11:9	system 6:10,19 9:5,	thank 4:4 14:5	transition 18:13
16:1 33:22	11 10:9,18	38:22	transmission 5:18 6:4
stating 3:15	11:20 12:5,	things 10:14,16,23	7:1,9,18,22
Stephens 3:19,20	21 13:4,19	think 7:14 13:21	8:4 9:6 10:3
11:17 24:25	14:13 15:1	14:20 17:19	12:11 15:20,
25:21 27:13	17:24 18:18	24:14 27:14	22,25 16:14,
38:24	19:3,15 20:7	28:16,24,25	18 17:8,12
stop 29:4	22:15 25:5,	30:14,17,18	22:1 25:24
strength 10:19	8,20 26:12	35:5,16	38:21
strike 18:4	31:23 35:4	thought 30:13 37:25	transmitted 22:12 24:4
substantially 18:13 19:4,	36:2,3,4,22	three 15:25 25:17	transmitter 13:23
8,13,16,20,	38:20	26:14 27:2,5	transmitting 16:19
22 20:1,2,5,	table 30:7 32:14	thumb 14:11	treating 34:8
6,12,13	34:1,19	tightening 35:22,24	truth 4:1,2
28:13 33:14,	tacit 6:20	time 17:20 38:23	truthfully 4:20
19	take 4:24 8:8	today 4:20	try 24:22
sufficient 25:4,19	10:24 15:15	transcript 31:1	turn 4:11 16:21
26:15,20	22:6 27:15		two 7:11,24 9:15
27:3	taken 4:16		14:14,22,23,
			24 15:1,7,21
			16:1 29:14
			33:5 34:9

36:8	way 14:21,24 15:1 25:9 26:22,23	
U	witness 3:9 4:3 39:2	
understand 4:15 5:8 31:17	Woods 4:8	
understanding 5:15 22:3 34:3	word 17:14,19 20:11 38:10	
unit 37:11	words 16:17	
unnecessary 22:1	worse 27:11	
user 37:2		
V	Y	
value 13:14 22:18, 24 23:10,15, 18,22 31:12	yeah 22:14,21 25:14 27:3 31:14,21 37:18 38:12	
vertical 13:13	Z	
view 11:1,10,23 18:25	zero 16:19	
voltage 18:12 25:5, 6,9,15,19		
W		
waive 3:12		
wall 37:21		
want 20:16 24:17		
wanted 33:10		
wave 15:3		
waves 15:5		