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Transcript of Robert Allan Durham, Ph.D.

Date: September 11, 2025

Case: Liberty Energy, Inc., et al. -v- U.S. Well Services, LLC (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 LIBERTY ENERGY, INC. AND LIBERTY OILFIELD SERVICES

6 LLC,

7 Petitioners,

8 v.

9 U.S. WELL SERVICES, LLC,

10 Patent Owner.

11
12 IPR2025-00139

13 U.S. Patent No. 11,208,878 B2

14
15 VIDEO-TELECONFERENCE DEPOSITION OF

16 ROBERT ALLAN DURHAM, Ph.D.

17 Thursday, September 11, 2025

18 10:37 a.m. EDT

19
20 Job No.: 599362

21 Pages: 1 - 59

22 Reported by: Cassidy Western, RPR, CRR, CA CSR, WA CCR

1 Deposition of ROBERT ALLAN DURHAM, Ph.D.,
2 conducted virtually.

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10 Pursuant to notice, before Cassidy Western, RPR,
11 CRR, CA CSR #14722, WA CCR #24000046, Notary Public in
12 and for the Commonwealth of Pennsylvania.

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1 ROBERT ALLAN DURHAM, Ph.D.,
2 of lawful age, being first duly sworn or affirmed
3 to testify to the truth, the whole truth, and
4 nothing but the truth, was examined and testified
5 as follows:

6 EXAMINATION BY COUNSEL FOR PATENT OWNER
7 BY MR. QUARLES:

8 Q Good morning, Dr. Durham.

9 A Good morning, Mr. Quarles.

10 Q I'll be asking you some questions today
11 about your declaration in IPR 2025-00139 regarding
12 US Patent Number 11,208,878. I'll be referring to
13 this patent today as the '878 patent.

14 Would you please state your full name
15 for the record?

16 A Sure. Robert Allan Durham. A-l-l-a-n.

17 Q And where are you today?

18 A I'm at Baker Botts office in Dallas.

19 Q Have you ever been deposed before?

20 A Yes, sir.

21 Q How many times?

22 A Oh, northwards of about 120 or so.

1 Q If you need a break today at any time,
2 please let me know. I'll do my best to take
3 breaks shortly after you ask for one. I will,
4 however, ask that you answer any pending question.
5 Do you understand?

6 A Yes.

7 Q If at any point you don't understand my
8 question, will you ask me to restate it or repeat
9 it so that we can assume that if you've answered a
10 question, you've understood it?

11 A Yes.

12 Q To help the court reporter, I just want
13 to take extra care that we both don't talk over
14 each other.

15 Do you have any documents in front of
16 you?

17 A I do have an errata sheet and the Zoom
18 meeting instructions. That's all I have in front
19 of me.

20 Q And you said you had an errata sheet?

21 A Yes. Items I had found in preparation
22 for my deposition that were typos in the

1 declaration.

2 Q Would you like to read those into the
3 record?

4 A Certainly. Paragraph 190, I start with:
5 Premset discloses that switch gear on
6 switch gear transport 200.

7 Should read:

8 Morris discloses that switch gear on
9 switch gear transport 200.

10 And for the court reporter, Premset is
11 P-r-e-m-s-e-t.

12 Paragraph 218, I start:

13 Oehring discloses an isolating ground
14 switch."

15 And it should read:

16 Premset catalog discloses an isolating
17 ground switch.

18 Paragraph 221 currently reads:

19 In addition to the disclosure of Claim 1
20 discussed above, Oehring 4 teaches the additional
21 limitations of Claim 8.

22 And it should read:

1 In addition to the disclosure of Claim 1
2 discussed above, Morris and Oehring 4 teaches the
3 additional limitations of Claim 8.

4 And that's all I noticed through my
5 review.

6 Q Okay. Do you have any other documents
7 in front of you?

8 A No. Just the Zoom meeting information
9 that I used to log in. That's it.

10 Q And you have a computer in front of you.
11 Is that right?

12 A Yes.

13 Q Is there anything open other than
14 applications open with the Zoom window on that?

15 A No. Just the Zoom stuff.

16 Q Okay. So no other applications are
17 open, then?

18 A Right.

19 Q How many times have you offered your
20 expert opinions in a patent case?

21 A I would actually guess it's about 30 or
22 40. Somewhere in that range. Different matters.

1 30 or 40 different matters I would say.

2 Q This is where you've done some sort of
3 report or given some sort of testimony in a patent
4 case?

5 A Yes, sir.

6 Q What is your pay rate for this case?

7 A 350 an hour for my analysis, and 485 for
8 deposition or -- well, there won't be court
9 testimony. That's it. 485 for deposition.

10 Q Do you have any patents?

11 A No.

12 Q Have you ever applied to get a patent?

13 A No.

14 Q Do you have any financial interest in
15 Liberty or the outcome of this IPR?

16 A No, sir.

17 Q Did you submit a declaration in
18 connection with this IPR proceeding?

19 A Yes, sir, I did.

20 MR. QUARLES: Kylan, would you please
21 bring up the file name EX-1003.

22 THE WITNESS: And if you could drop that

1 in the chat so I can reference it in context, I'd
2 appreciate it as well.

3 MR. QUARLES: This has previously been
4 marked as Exhibit 1003.

5 (Exhibit 1003, previously marked for
6 identification, is attached to the transcript.)

7 BY MR. QUARLES:

8 Q And Dr. Durham, let me know when you're
9 able to access the document.

10 A Certainly.

11 Okay. It looks like I can access it
12 now.

13 Q Is this your declaration?

14 A It appears to be, yes.

15 Q Is this your signature on page 253?

16 A Yes, sir.

17 Q Other than the errata that you mentioned
18 earlier, is there anything that you'd like to
19 change in your declaration after your preparation
20 for today's deposition?

21 A No, sir. Not at this time.

22 Q What did you do to prepare for your

1 deposition?

2 A I reviewed my declaration, reviewed the
3 art that I relied on in my analysis grounds. I
4 think, yes, I reviewed the Patent Owner's
5 preliminary response and the intuition decision by
6 the patent board. Met with counsel. And I
7 reviewed some of the other references as well as
8 they came up. Some of the other premarked
9 exhibits.

10 I think that encompasses what I did.

11 Q How many hours did you spend preparing
12 for your deposition?

13 A All said, probably around 20, 25.

14 Q You mentioned that you met with counsel.
15 Did you meet with anyone else to prepare for
16 today's deposition?

17 A No, sir.

18 Q Who exactly did you meet with?

19 A Mr. McDonald.

20 Q Anyone else?

21 A I think Mr. Walters came in the room for
22 a couple minutes, but we mostly discussed a

1 different matter. But he was in the room for some
2 of it.

3 Q In Sections 2 and 3 of your declaration,
4 you list multiple materials that you considered in
5 drafting this declaration. Is that right?

6 A Yes, sir. Yes, sir. And 3, it looks
7 like.

8 Q Did you consider any other documents
9 besides those listed in Sections 2 and 3 in
10 writing your declaration?

11 A In authoring it? No, I did not.

12 MR. QUARLES: Let's turn to what's been
13 previously identified as Exhibit 1004.

14 Kylan, would you please bring up the
15 file name EX-1004.

16 (Exhibit 1004, previously marked for
17 identification, is attached to the transcript.)

18 BY MR. QUARLES:

19 Q And Dr. Durham, if you could let me know
20 when you have access to that.

21 A Certainly.

22 Okay. I've got that.

1 Q I'll be referring to this reference as
2 Morris. Fair?

3 A Yes, sir.

4 Q Let's turn to paragraph 0027.

5 A Okay. I've got that.

6 Q In paragraph 0027, it says, about the
7 fifth line down, starting there:

8 Figure 1 depicts that the switch gear
9 transport 108 generates a total of seven medium
10 voltage, for example, 13.8 kilovolt cable
11 connections 44, 45 where each fracturing pump
12 transport 104 is directly connected to the switch
13 gear transport 108 with a single medium voltage,
14 for example, 13.8 kilovolt cable connection 44.

15 Do you see that?

16 A Yes, sir.

17 Q So Morris discloses that switch gear
18 transport 108 is a separate transport from
19 fracturing transport pump 104. Right?

20 A Yes, that's correct.

21 Q So the switch gear that are on switch
22 gear transport 108 are not on the same transport

1 as the pumps on fracturing pump 104. Right?

2 A Correct. In this embodiment, that's
3 correct.

4 Q And the switch gear that are on switch
5 gear transport 108 are not on the same transport
6 as the transformers 110. Right?

7 A Yes. That's correct in this embodiment.

8 Q Would it have been obvious based on the
9 Morris disclosures that a POSITA could put the
10 transformers 110 on switch gear transport 108?

11 A Based strictly on Morris, I think the
12 placement of electrical equipment in general would
13 have been obvious. Certainly not explicit in
14 Morris. It doesn't use those words, but I think
15 it would have been obvious to move them over
16 there, particularly in light of other teaching in
17 the art that has transformers and switch gear on
18 the same trailer.

19 Q Would it have been obvious based on the
20 Morris disclosures that a POSITA could put the
21 switch gear and transformer on one transport and
22 put the drive and pump on a separate transport?

1 A Yes. Based on the disclosure of Morris
2 and the POSITA's general knowledge of electrical
3 systems, yes.

4 Q Would it have been obvious based on the
5 Morris disclosures that a POSITA could put the
6 switch gear, transformers, and drive on one
7 transport and put the pump on a different
8 transport?

9 A Yes. Well, just on Morris, perhaps not.
10 I would really want to dig into that one and see
11 what Morris says more about that. But I --
12 typically, you would want to see the drive close
13 to the motor in a properly engineered system. So
14 I think the answer to that question is I'm not
15 sure, just based on Morris alone.

16 MR. QUARLES: Let's turn to what's been
17 previously identified as Exhibit 1006.

18 Kylan, would you please bring up file
19 name EX-1006.

20 (Exhibit 1006, previously marked for
21 identification, is attached to the transcript.)
22

1 BY MR. QUARLES:

2 Q And Dr. Durham, if you would let me know
3 when you can access that.

4 A Okay. I've accessed it here.

5 Q I'll be referring to this reference as
6 Oehring 4. Fair?

7 A Yeah. Let me make sure the numbers
8 matched.

9 Yes, sir, that's fair.

10 Q In paragraph 49, Oehring describes
11 switch gear trailer 325 as shown in Figure 3A.
12 Right?

13 A Yeah. Let me get to 49 there first.
14 Could you ask that question again?

15 Q Sure.

16 In paragraph 0049, Oehring 4 describes
17 switch gear trailer 325 as shown in Figure 3A.
18 Right?

19 A Yes, I can agree with that.

20 Q In paragraph 0051, Oehring 4 describes
21 switch gear trailer 325 and says that it "can
22 house large breakers and fault protection

1 equipment." Right?

2 A Yes, sir. That's what it says.

3 Q In paragraph 52, it also describes how a
4 "600-volt power connection panel 401 contains
5 power connections for two fracturing pumps."
6 Right?

7 A Yes, sir.

8 Q So Oehring 4 discloses that the
9 fracturing pumps on fracturing pump trailer 425
10 are not on the same trailer as the switch gear
11 that is located on switch gear trailer 325.
12 Right?

13 A Yes. I could agree with that.

14 Q Looking back at paragraph 0053, Oehring
15 4 says:

16 In the illustrated example, the upper
17 row of plugs 402-a includes six single-phase cable
18 connections, and the lower row of plugs 402-b
19 includes six single-phase cable connections,
20 allowing for two cables per phase.

21 Do you see that?

22 A Yes, sir.

1 Q At the last sentence in the paragraph,
2 Oehring 4 further says:

3 Additional cables can span between the
4 13.8-kilovolt to 600-volt transformer and the
5 fracturing pump trailer 425.

6 Do you see that?

7 A Yes.

8 Q So a POSITA would understand that
9 Oehring 4 discloses that its 13.8-kilovolt to
10 600-volt transformer described in paragraph 0053
11 is not on the same trailer as fracturing pump
12 trailer 425. Right?

13 A Correct.

14 Q Based on Oehring 4's disclosures in
15 paragraph 0053, would it be obvious that the
16 13.8-kilovolt to 600-volt transformer described in
17 paragraph 0053 could be on the same trailer as
18 switch gear located on switch gear trailer 325,
19 but on a different trailer than fracturing pump
20 trailer 425?

21 MR. McDONALD: Objection; form.

22 THE WITNESS: Are you asking strictly

1 about that one paragraph or are you asking
2 generally about Oehring 4 and the knowledge of a
3 POSITA?

4 BY MR. QUARLES:

5 Q Based on the disclosures of Oehring 4
6 and the knowledge of a POSITA, would it be obvious
7 that the 13.8-kilovolt to 600-volt transformer
8 described in paragraph 0053 could be on the same
9 trailer as switch gear located on switch gear
10 trailer 325 but on a different trailer than
11 fracturing pump trailer 425?

12 A Yes.

13 MR. McDONALD: Same objection.

14 MR. QUARLES: Let's turn to what's been
15 previously marked as Exhibit 1013.

16 Kylan, would you please bring up file
17 name EX-1013.

18 (Exhibit 1013, previously marked for
19 identification, is attached to the transcript.)

20 BY MR. QUARLES:

21 Q And Dr. Durham, if you could let me know
22 when you can see that.

1 A Sure.

2 Okay. I've got that pulled up.

3 Q In paragraph 0043, Payne describes
4 fracturing pump unit trailers 20a through 20h that
5 are positioned around a well head 10. Right?

6 A Yes. You're referring to that first
7 line? Or sentence, I mean?

8 Q That's right.

9 About nine lines down from the beginning
10 of the paragraph, paragraph 0043 also describes
11 transformers, transformer trailers 70a through 70d
12 as adjacent to fracturing pump unit trailers 20a
13 through 20h. Right?

14 A Yes.

15 Q And each of the transformer trailers
16 includes a pair of eight fracturing transformer
17 units 300a through 300h. Right?

18 A Yes.

19 Q So the transformer units on transformer
20 trailers 70a through 70d are on a separate trailer
21 from fracturing pump unit trailers 20a through
22 20h. Right?

1 MR. McDONALD: Objection; form.

2 THE WITNESS: Yes, they are.

3 BY MR. QUARLES:

4 Q Paragraph 0044 describes switch gear
5 trailers 80a and 80b. Right?

6 A Yes.

7 Q And switch gear trailers 80a and 80b
8 include two switch gear modules 200a and 200b that
9 are electrically connected to four turbine
10 generators 100a through 100d. Right?

11 A Yes, sir.

12 Q So switch gear module 200a on switch
13 gear trailer 80a is on a different trailer than
14 fracturing pump trailer 20a. Right?

15 A Yes.

16 Q And switch gear module 200a on switch
17 gear trailer 80a is on a different trailer than
18 transformer 300a on transformer trailer 70a.
19 Right?

20 A Yes, I agree with that.

21 Q Based on Payne's disclosures and the
22 knowledge of a POSITA, would it have been obvious

1 that Payne's switch gear module 200a could be on
2 the same trailer as Payne's transformer, but on a
3 different trailer than Payne's fracturing pumps?

4 MR. McDONALD: Objection; form.

5 THE WITNESS: Yes, I believe that based
6 on the knowledge of a POSITA and the disclosure of
7 Payne, that would be obvious.

8 MR. QUARLES: Let's look at what's been
9 previously marked as Exhibit 1003.

10 Kylan, would you please bring up file
11 name EX-1003.

12 Actually, let's scratch that. Let's
13 turn to what's been previously marked as
14 Exhibit 1004.

15 Kylan, would you please bring up
16 EX-1004.

17 BY MR. QUARLES:

18 Q Dr. Durham, if you could let me know
19 when you have access to that.

20 A Okay. Yeah, I've got that. All the
21 ones we've already looked at are easy to get to.

22 Q In paragraph 0019, it says:

1 Unless otherwise specified within the
2 disclosure, the term "electrical connection"
3 refers to connecting one transport to another
4 transport using one or more electrical cables.

5 Do you see that?

6 A Yes, sir.

7 Q So here in paragraph 0019, it's
8 describing electrical cables from one transport to
9 another transport. Right?

10 A Well, it's referring to that as an
11 electrical connection. I don't think it describes
12 it, per se. But it does refer -- that electrical
13 connection term refers to that, connecting one
14 transport to another transport using one or more
15 electrical cables.

16 Q Let's look at paragraph 0027. In
17 paragraph 0027, Morris says that:

18 The switch gear transport 108 outputs
19 and supplies medium voltage, for example,
20 13.8-kilovolt, with cable connections 45, 44
21 directly to the hydration-blender transport 106
22 and the fracturing pump transport 104 without

1 connecting to any intermediate transports.

2 Do you see that?

3 A Yes.

4 Q So here in paragraph 0027, Morris is
5 describing cable connections between the switch
6 gear transport 108 and the fracturing pump
7 transport 104. Right?

8 A Yes, sir, along with the blender. But
9 yes.

10 Q Let's look at paragraph 0028. In
11 paragraph 0028, it says:

12 The medium voltage power distribution
13 system shown in Figure 1 is able to reduce the
14 number of electrical cables used to supply
15 electrical power to the fracturing pump transport
16 104 and hydration-blender transport 106 when
17 compared to other power distribution systems that
18 provide power to the different transports at lower
19 voltage levels, for example, 4.2 kilovolts,
20 600 volts, and 480 volts.

21 Do you see that?

22 A Yes, sir.

1 Q So here in paragraph 0028, Morris is
2 explaining how it reduces the number of electrical
3 cables to fracturing pump transport 104. Right?

4 A Yes.

5 Q So here in Morris paragraph 0028, Morris
6 is not expressly discussing electrical cables
7 between components that are all located on the
8 same fracturing pump transport 104. Right?

9 MR. McDONALD: Objection; form.

10 THE WITNESS: I would agree with that.

11 BY MR. QUARLES:

12 Q Let's look at paragraph 0029. In
13 paragraph 0029, it says:

14 One reason the medium voltage power
15 distribution system is able to utilize less
16 electrical cables is that each electrical cable
17 44, 45 does not need to supply a relatively high
18 current, for example, equal to or more than
19 600 amps, to each fracturing pump transport 104
20 and hydration-blender transport 106.

21 Do you see that?

22 A Yes, sir.

1 Q So here in paragraph 0029, Morris is
2 discussing electrical cables to fracturing pump
3 transport 104. Right?

4 A Yes. He does discuss that in that
5 paragraph.

6 Q Let's turn to paragraph 0031. In
7 paragraph 0031, it says:

8 For example, the fracturing pump
9 transport 104 may mount a three phase or three
10 winding transformer 110 to step down the voltage
11 to two different voltage levels. The 4.2-kilovolt
12 or 2.1-kilovolt voltage level supplies electric
13 power to one or more electric prime movers, not
14 shown, that drive one or more pumps, not shown,
15 and the 480-volt, 240-volt, and 110-volt supplies
16 electric power to the drives and/or other control
17 instrumentation mounted on the fracturing pump
18 transport 104.

19 Do you see that?

20 A Yes, sir.

21 Q Morris references the term "drive."
22 Right?

1 A Yes.

2 Q Could this be a fixed frequency drive?

3 A Could be, yep, as I say in my
4 declaration.

5 Q Morris does not expressly describe his
6 drive as a variable frequency drive. Right?

7 A I would agree with that.

8 Q And Morris does not expressly use the
9 term "variable" in describing his drive. Right?

10 A Yes, I can agree with that.

11 Q Does Morris expressly use the term "VFD"
12 anywhere in its specification?

13 A No. It does not use that term.

14 MR. QUARLES: Let's look at what's been
15 previously identified as Exhibit 2001.

16 Kylan, if you would please bring up file
17 name EX-2001.

18 (Exhibit 2001, previously marked for
19 identification, is attached to the transcript.)

20 BY MR. QUARLES:

21 Q Dr. Durham, if you could let me know
22 when you can access that.

1 A Okay.

2 Okay. I'm there.

3 Q This is U.S. Patent 9,945,365 to
4 Hernandez. Do you see that?

5 A Yes, sir.

6 Q The title of Hernandez is "Fixed
7 Frequency High-Pressure High Reliability Pump
8 Drive." Do you see that?

9 A I do.

10 Q In Column 1 around Row 27, it says
11 disclosed --

12 A Let me -- let me get there.

13 All right. I'm there. Go ahead.

14 Q It says:

15 Disclosed is an apparatus configured to
16 hydraulically fracture an earth formation.

17 Do you see that?

18 A Yes, sir.

19 Q So Hernandez is directed to hydraulic
20 fracturing. Right?

21 A Yes, I agree with that.

22 Q Starting around Row 28, Hernandez says:

1 The apparatus includes a pump configured
2 to hydraulically fracture the earth formation by
3 pumping a fracturing liquid into a borehole,
4 penetrating the earth formation, an electric motor
5 having a rotor coupled to the pump and a stator
6 and a motor control center configured to apply an
7 alternating electrical voltage having a fixed
8 frequency to the stator in order to power the
9 electric motor, wherein the apparatus and the
10 motor control center do not have a variable
11 frequency drive.

12 Do you see that?

13 A Yes, sir.

14 Q So a POSITA would recognize that, for
15 example, fixed frequency drives were known in the
16 art at the time of the '878 patent invention.
17 Right?

18 A Oh, certainly. I can agree with that
19 for sure.

20 Q And fixed frequency drives for use in
21 hydraulic fracturing were known in the art at the
22 time of the '878 patent invention. Right?

1 A Yes, I agree with that.

2 Q Looking at Hernandez Column 4, starting
3 at Line 9. Let me know when you're there.

4 A Hernandez doesn't have the columns
5 marked. Is that the column that contains brief
6 descriptions of the drawings?

7 Q It's displayed on the screen there.

8 A Oh, here we go.

9 Oh, I'm sorry. I've got the wrong
10 document open. I apologize.

11 Q No problem.

12 A Okay. Column 4. I'm at Column 4.

13 Q Starting at Line 9, it says:

14 It can be appreciated that use of the
15 fixed-frequency electric motor provides many
16 advantages.

17 Do you see that?

18 A That's what it says, yes.

19 Q Based on the Hernandez disclosure, a
20 POSITA would recognize that fixed-frequency
21 electric motors do provide some advantages when
22 compared to variable frequency drives. Right?

1 A Yes, sir. I can agree with that. Like
2 most engineering systems, it's a tradeoff.

3 Q At Row-- at Column 4, Row 10, it says:

4 A first advantage is that by not using a
5 variable frequency drive, VFD, equipment
6 reliability is increased due to less equipment
7 requirements.

8 Do you see that?

9 A Yes, sir, that's what it says.

10 Q Based on the Hernandez disclosure, a
11 POSITA would recognize that one of the benefits of
12 using a fixed frequency drive instead of a VFD is
13 that there may be less equipment requirements.
14 Right?

15 A That's what Hernandez teaches, yes. I
16 don't know if I agree with that, but that's at
17 least what Hernandez teaches.

18 Q Around Column 4, Row 13, it says:

19 A second advantage is that not using a
20 VFD -- 15 -- eliminates electrical current
21 harmonics due to semiconductor switching and their
22 potentially damaging effects in the electric

1 motor.

2 Do you see that?

3 A Yes.

4 Q Based on the Hernandez disclosures, a
5 POSITA would recognize that one of the benefits of
6 using a fixed frequency drive instead of a VFD is
7 that not using a VFD eliminates electrical current
8 harmonics due to semiconductor switching that may
9 occur in the VFD. Right?

10 A Yes.

11 Q And a POSITA would recognize that such
12 electrical current harmonics may have potentially
13 damaging effects in the electric motor. Right?

14 A Yes. It can.

15 Q At Column 4, Line 20, it says:

16 A fourth advantage is that by not having
17 a VFD and associated cooling components, the
18 weight loading on a trailer carrying the
19 pump-motor combination is reduced, enabling the
20 trailer to carry more pump and motor weight, thus
21 providing increased pumping capacity while at
22 the -- 25 -- at the same time being light enough

1 to be below the legal weight limit for transport
2 over public roads.

3 Do you see that?

4 A Yes.

5 Q Based on the Hernandez disclosures, a
6 POSITA would recognize that one advantage of a
7 fixed frequency drive over a variable frequency
8 drive is that a variable frequency drive may have
9 more cooling requirement than a fixed frequency
10 drive. Right?

11 A Yeah, I can agree with that. It may
12 have more cooling requirements.

13 MR. QUARLES: Let's turn to what's been
14 previously marked as Exhibit 1006.

15 Kylan, if you could display file name
16 EX-1006.

17 BY MR. QUARLES:

18 Q And Dr. Durham, if you could let me know
19 when you can access that.

20 A Okay. I've got 1006. I think I've got
21 the right document this time.

22 Q Let's turn to paragraph 0053. If you

1 could let me know when you're there.

2 A Okay. I've got it pulled up.

3 Q In paragraph 0053, it says:

4 The power connection panel 401 can also
5 include a control power cable 404 and a system
6 ground cable 406. The system ground cable 406 can
7 act as a ground between the fracturing pump
8 trailer 425 and a 13.8-kilovolt to 600-volt
9 transformer, not shown, providing power to the
10 fracturing pump trailer 425.

11 Do you see that?

12 A Yes, sir.

13 Q Paragraph 0053 does not expressly
14 describe ground cable 406 being connected to
15 switch gear on switch gear trailer 325. Right?

16 MR. McDONALD: Objection; form.

17 THE WITNESS: That's correct. I agree
18 with that.

19 MR. QUARLES: Let's turn back to what's
20 previously been marked as Exhibit 1004.

21 THE WITNESS: Okay. I've got that
22 pulled up.

1 BY MR. QUARLES:

2 Q Specifically let's look paragraph 0037.

3 Morris paragraph 0037 says:

4 The switch gear transport 108 could also
5 be set up to act as a hub for receiving control
6 and monitoring information for fracturing fleet
7 103.

8 Do you see that?

9 A Yes, sir.

10 Q What would be the advantages of the
11 switch gear transport being set up to act as a
12 hub?

13 A Well, I think it goes on in that
14 paragraph to explain those advantages. It would
15 allow the switch gear transport 108 to
16 communicate, monitor and provide control signals
17 to other transports, such as fracturing pump
18 transport 104 and hydration-blender transport 106.

19 And it also says that switch gear
20 transport 108 could house control of monitoring
21 equipment to communicate with other transports.
22 And then goes on to list different data or control

1 functions. I guess data that would be -- could be
2 monitored from transport 108, including power
3 measurements, power management equipment, safety
4 circuits, safety logic, and communicate those back
5 to data van 114.

6 Q In paragraph 0038, it says:

7 Although not explicitly shown in
8 Figure 1, the switch gear transport 108 may also
9 be able to power a second fracturing fleet located
10 at an adjacent well site or for the purpose of
11 fracturing multiple well heads 101.

12 Do you see that?

13 A Yes, sir.

14 Q What would a POSITA understand to be the
15 advantages of the switch gear transport being able
16 to power a second fracturing fleet?

17 A Oh, I can think of maybe -- it may
18 eliminate a second switch gear transport. It also
19 may allow for one generator to fracture two -- or
20 to power two different fracturing fleets. Perhaps
21 the fracturing fleets could be used alternately so
22 you could have the generating system running more

1 constantly and make more use of the generator from
2 a time standpoint.

3 Those are at least some of the
4 advantages I can think of.

5 MR. QUARLES: Let's turn to what's
6 previously been marked as Exhibit 1011.

7 Kylan, if you could put that up.

8 (Exhibit 1011, previously marked for
9 identification, is attached to the transcript.)

10 BY MR. QUARLES:

11 Q And Dr. Durham, if you could let me know
12 when you can access that.

13 A Sure.

14 Okay. I've got Pratt -- or 1011 up.

15 Q Let's look at Column 1, Lines 14 through
16 18.

17 A Okay.

18 Q Pratt discloses usage of cable trays in
19 a building, plant, or refinery. Right?

20 A A building, plant, refinery or other
21 facility, if you're looking at Line 18.

22 Q That's correct.

1 Pratt does not expressly discuss usage
2 of cable trays in fracking operations. Right?

3 A I agree with that.

4 Q Pratt does not expressly discuss usage
5 of cable trays on a transport trailer. Right?

6 MR. McDONALD: Objection; form.

7 THE WITNESS: I don't know the answer to
8 that question without reviewing Pratt again with
9 that in mind.

10 BY MR. QUARLES:

11 Q Please take a few moments and review.

12 A Sure.

13 Yes, I can agree that Pratt does not
14 mention transport trailers.

15 MR. QUARLES: Let's turn to what's been
16 previously marked as Exhibit 1002.

17 Kylan, if you would please display file
18 name EX-1002.

19 (Exhibit 1002, previously marked for
20 identification, is attached to the transcript.)

21 BY MR. QUARLES:

22 Q Dr. Durham, we'll specifically be

1 discussing what's been marked as EX-1002, part 5.

2 A Okay.

3 Q If you could let me know when you're
4 there.

5 A Okay.

6 Q On page --

7 A All right. I've got that up.

8 Q On page 2128. Let me know when you're
9 there.

10 A Sure. 28. Okay.

11 Q On page 2128, there is an office
12 communication from the Patent Office regarding
13 application 16/597,014. Right?

14 A Yes, sir.

15 Q Application 16/597,014 is the
16 application that led to the '878 patent. Right?

17 A Yes, that's correct.

18 Q Let's look at page 2129.

19 A Okay.

20 Q The office action summary indicates
21 Claims 1 through 20 are rejected. Right?

22 A Yes.

1 Q Let's look at page 2131.

2 A Okay.

3 Q The Office action indicates a
4 Section 103 obviousness rejection. Right?

5 A Yes.

6 Q The Office action further indicates an
7 obviousness rejection as being unpatentable over
8 Morris, et al. US Patent [sic]
9 Number 2019/0203572. Right?

10 A I believe it's U.S. Publication
11 Number 2019/0203572.

12 Q That's right. U.S. Patent Publication
13 Number 2019/0203572.

14 A Yes, sir, that's correct.

15 Q For our purposes, we'll call this
16 Morris 572. Fair?

17 A Okay.

18 Q Further down in this same rejection on
19 page 2136 -- let me know when you're there.

20 A 2136. Okay.

21 Q It says:

22 Claims 7 and 14 is/are rejected under

1 35 U.S.C. 103 as being unpatentable over Morris,
2 et al., U.S. Publication 2019/0203572, as applied
3 to Claims 1 and 9 above, and in further view of
4 Oehring, et al., US Patent Number 2016/0105022.

5 Do you see that?

6 A Yes, sir.

7 Q I'll refer to U.S. Patent Publication
8 Number 2016/0105022 as Oehring 3 for consistency
9 with your report. Is that fair?

10 A Consistency with what my -- I missed the
11 last word.

12 Q U.S. Patent Publication
13 Number 2016/0105022 is referred to as Oehring 3 in
14 paragraph 40 of your declaration. Right?

15 A It lists that in the list of exhibits.
16 Yes, I did call that Oehring 3.

17 Q So for consistency, I'll refer to
18 U.S. Patent Publication Number 2016/0105022 as
19 Oehring 3. Fair?

20 A That's fair.

21 Q We'll come back to Oehring 3 in a bit,
22 but let's first discuss Morris 572.

1 MR. QUARLES: Kylan, would you please
2 bring up file name EX-2010, and let's mark this as
3 Exhibit 2010.

4 (DURHAM Exhibit 2010 was marked for
5 identification and is attached to the transcript.)

6 Q And Dr. Durham, if you could let me know
7 when you can access this.

8 A Sure.

9 Okay. I've got 2010 open.

10 Q This is U.S. Patent Publication
11 Number 2019/0203572, which we're referring to as
12 Morris 572. Right?

13 A Yes, sir.

14 Q Let's look at paragraph 0078.

15 A Okay. I've got 0078.

16 Q In Morris 572, paragraph 0078, at the
17 top of page 8, it says:

18 The fracturing pump trailer power and
19 control system 708 may comprise one or more
20 electric drives, transformers, controls, for
21 example, a programmable logic controller, PLC,
22 located on the fracturing pump transport 700.

1 Do you see that?

2 A Yes, sir.

3 Q So Morris 572 discloses its fracturing
4 pump trailer may include transformers. Right?

5 A Yes.

6 Q Morris 572 discloses its fracturing pump
7 trailer may include electric drives. Right?

8 A Yes, sir.

9 MR. QUARLES: Let's look at
10 Exhibit 1001.

11 Kylan, if you could please bring up file
12 name EX-1001.

13 (Exhibit 1001, previously marked for
14 identification, is attached to the transcript.)

15 THE WITNESS: Okay. I've got 1001 open.

16 BY MR. QUARLES:

17 Q Let's look at page 5.

18 A Okay.

19 Okay.

20 Q On or about the 40th patent publication
21 listed in the left column, there is U.S. Patent
22 Publication Number 2019/0003329 to Morris. Do you

1 see that?

2 A Yes. I do see that.

3 Q So let's turn to U.S. Patent Publication
4 Number 2019/0003329, which for our discussion, I
5 will refer to as Morris 329.

6 MR. QUARLES: Kylan, would you please
7 Bring up file name EX-2011. And please mark this
8 as Exhibit 2011.

9 (DURHAM Exhibit 2011 was marked for
10 identification and is attached to the transcript.)

11 THE WITNESS: All right. I've got
12 Exhibit 2011 pulled up.

13 BY MR. QUARLES:

14 Q This is U.S. Patent Publication
15 Number 2019/0003329, which we're referring to as
16 Morris 329. Right?

17 A Yes, sir.

18 Q Let's look at paragraph 0056.

19 A Okay. I'm there.

20 Q About 11 lines from the bottom of the
21 paragraph, it says:

22 For example, the fracturing pump

1 transport 304 may mount a three phase or three
2 winding transformer to step down the voltage to
3 two different voltage levels. Recall that the
4 4.2-kilovolt voltage level supplies electric power
5 to one or more electric prime movers that drive
6 one or more pumps and the 480-volt supplies
7 electric power to the drives and/or other control
8 instrumentation mounted on the fracturing pump
9 transport 304.

10 Do you see that?

11 A Yes, sir.

12 Q So a POSITA would understand that Morris
13 329 discloses drives mounted on the fracturing
14 pump transport 304. Right?

15 A Yes, sir.

16 Q A POSITA would understand that Morris
17 329 discloses fracturing pump transport 304 may
18 include a transformer. Right?

19 A Yes.

20 Q Let's look at the last sentence of
21 paragraph 0058. Scratch that.

22 Let's look at the last sentence in

1 paragraph 0056.

2 A Okay.

3 Q It says:

4 Transformers 310 and 312 are configured
5 to supply enough electric current to power the
6 prime movers, drivers, and/or other control
7 instrumentation.

8 Do you see that?

9 A Yes, sir.

10 Q So a POSITA would understand that
11 Morris 329 discloses its transformer supplies
12 power to its prime movers. Right?

13 A Yes, sir.

14 Q A POSITA would understand that
15 Morris 329 discloses its transformer supplies
16 power to its drives. Right?

17 A Yes.

18 Q Let's look at paragraph 0058.

19 A Okay.

20 Q Around the seventh line down in
21 paragraph 0058, it says:

22 Having autonomous trailers allows the

1 mobile fracturing system 302 to become scalable
2 and flexible where each fracturing pump transport
3 may be interchangeable with each other.

4 Do you see that?

5 A Yes.

6 Q So a POSITA would understand that
7 Morris 329 discloses that having autonomous
8 trailers allows the mobile fracturing system to
9 become scalable and flexible. Right?

10 A Yes. It says that.

11 It looks like we've been going about an
12 hour, so when you're ready to move to a new
13 document, I'd like a break.

14 Q Okay. Fair enough.

15 MR. QUARLES: We've been going a little
16 bit longer on this one, so I think now is a fine
17 time to take a break.

18 (Break held off the record from
19 11:39 a.m. to 11:49 a.m.)

20 BY MR. QUARLES:

21 Q Let's continue with Morris 329. Towards
22 the bottom of the paragraph, paragraph 0058, it

1 says:

2 Conversely, if the well is large and/or
3 the well site is located at high elevations and/or
4 high temperatures, more fracturing pump transports
5 304 can be stacked to increase pumping capacity
6 without utilizing additional support base
7 transports, for example, drive power transports
8 104, shown in Figures 1 and 2.

9 Do you see that?

10 A Yes, sir.

11 Q So a POSITA would understand that Morris
12 329 discloses more fracturing pump transports can
13 be stacked to increase pumping capacity without
14 utilizing additional support base transports such
15 as drive power transports 104. Right?

16 A Yes, sir.

17 Q Let's look at paragraph 0054.

18 A Okay.

19 Q In paragraph 0054, starting about six
20 lines up from the bottom of the paragraph, it
21 says:

22 Each fracturing pump transport 304 is

1 directly connected to the switch gear transport
2 308 with a single medium voltage, for example,
3 13.8-kilovolt, cable connection.

4 Do you see that?

5 A Yes, sir.

6 Q So a POSITA would understand that Morris
7 329 discloses that each of its fracturing pump
8 transport 304 is directly connected to the switch
9 gear transport 308 with a single medium voltage,
10 for example, 13.8-kilovolt cable connection.
11 Right?

12 A Yes.

13 Q Let's look at paragraph 0055. At the
14 beginning of paragraph 0055, it says:

15 The medium voltage power distribution
16 system shown in Figure 3 is able to reduce the
17 number of electrical cables used to supply
18 electric power to the fracturing pump transport
19 304.

20 Do you see that?

21 A Yes.

22 Q And let's look at Figure 3.

1 A Okay.

2 Q In Figure 3 there's a connection between
3 switch gear 308 and transformer 310. Right?

4 MR. McDONALD: Objection; form.

5 THE WITNESS: There would be.

6 BY MR. QUARLES:

7 Q So Morris 329 discloses the medium
8 voltage power distribution system is able to
9 reduce the number of electrical cables used to
10 supply power to the pump transport. Right?

11 A That's what it says, yes, sir. As
12 compared to the medium low power distribution
13 system shown in Figure 2, to complete the
14 sentence.

15 Q Starting around the third line from the
16 top of page 7, still in paragraph 0055, it says:

17 Supplying electric power at relatively
18 lower current levels avoids the safety concerns
19 and/or connection/disconnection issues associated
20 with using a single electrical cable that supplies
21 relatively high current, for example, 600A.

22 Do you see that?

1 A Yes.

2 Q So Morris 329 discloses a benefit of
3 supplying electric power at relatively lower
4 current levels avoids the safety concerns
5 associated with using a single electrical cable
6 that supplies relatively high current. Right?

7 A Correct, it says that.

8 Q And Morris 329 discloses a benefit of
9 supplying electric power at relatively lower
10 current levels avoids connection issues relative
11 to using a single electrical cable that supplies
12 relatively high current. Right?

13 A Correct. Safety concerns and/or
14 connection/disconnection issues.

15 MR. QUARLES: Let's look at what's been
16 previously marked as Exhibit 1014.

17 Kylan, if you would please bring up the
18 file name marked EX-1014.

19 (Exhibit 1014, previously marked for
20 identification, is attached to the transcript.)

21 BY MR. QUARLES:

22 Q And Dr. Durham, if you could let me know

1 when you can see that.

2 A Sure.

3 Okay. I've got 1014 up.

4 Q Let's look at paragraph 0021.

5 A Okay.

6 Q And around the fourth row from the
7 bottom of the paragraph, it says:

8 In addition, each electric motor 14 can
9 be equipped with a variable frequency drive, VFD,
10 and an A/C console, that controls the speed of the
11 electric motor 14, and hence the speed of the
12 pump 10.

13 Do you see that?

14 A Yes.

15 Q So in paragraph 0021, it discloses
16 electric motor 14 can be equipped with a variable
17 frequency drive, for example, a VFD. Right?

18 A Correct. It -- yeah, uses the VFD
19 acronym for variable frequency drive.

20 Q And in paragraph 0021, it discloses a
21 VFD that controls the speed of the electric motor
22 14. Right?

1 A Yes, sir.

2 MR. QUARLES: Let's look at what's been
3 previously marked as Exhibit 1003.

4 Kylan if you would please display file
5 name EX-1003.

6 BY MR. QUARLES:

7 Q And Dr. Durham, if you would let me know
8 when you have access to that.

9 A Okay. I've got that one pulled up.

10 Q This is your declaration. Right?

11 A Yes, sir.

12 Q Let's turn to paragraph 199.

13 A Okay.

14 Q In paragraph 199, about six lines down
15 from the start of the paragraph, you say:

16 To Morris, as to a POSITA, the use of
17 drives to control the speed of motors, including
18 fracturing pump motors, was so prevalent that it
19 required little teaching of how to implement the
20 drives other than to state that they are located
21 on the pump transport and would allow the
22 transports to "become individually autonomous by

1 removing the need for other separate support
2 trailers."

3 Do you see that?

4 A Yes.

5 Q Are you saying that Morris's fracturing
6 pump transport 104, as disclosed, is autonomous to
7 the degree that switch gear transport 108 is not
8 required?

9 MR. McDONALD: Objection; form.

10 THE WITNESS: No.

11 BY MR. QUARLES:

12 Q Does Morris's system, as disclosed,
13 require additional support base transports?

14 A Not necessarily.

15 Q Is Morris's system, as disclosed,
16 individually autonomous?

17 A Yes.

18 Q And did I understand correctly that you
19 said that Morris's system, as disclosed, requires
20 additional support base transports?

21 A No, it does not. That's correct, it
22 does not. Your question -- anyway, it does not

1 require additional support base trailers.

2 MR. QUARLES: All right. At this point
3 it's about noon here, so maybe let's take an early
4 lunch.

5 MR. McDONALD: I'm not sure our lunch is
6 here yet.

7 THE WITNESS: If we don't have lunch,
8 it's kind of hard to take it.

9 MR. McDONALD: If we could go for a
10 little longer, that'd be good. We can keep an eye
11 out for lunch.

12 MR. QUARLES: I don't have a whole lot
13 more, but let's take about a 30-minute break and
14 I'll come back. But I probably won't have a whole
15 lot more.

16 (Break held off the record from
17 12:03 p.m. to 12:35 p.m.)

18 MR. QUARLES: I have no further
19 questions. So at this time I'll pass the witness.

20 MR. McDONALD: No further questions.
21 We'll reserve the right to read and sign.

22 (Off the record at 12:35 p.m.)

ACKNOWLEDGMENT OF DEPONENT

I, ROBERT ALLAN DURHAM, PH.D., do hereby
acknowledge that I have read and examined the foregoing
testimony, and the same is a true, correct, and complete
transcription of the testimony given by me, and any
corrections appear on the attached Errata sheet signed
by me.

(DATE)

(SIGNATURE)

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CERTIFICATE OF SHORTHAND REPORTER

I, Cassidy Western, Registered Professional
Reporter, Certified Realtime Reporter, Certified
Shorthand Reporter, do hereby certify:

That ROBERT ALLAN DURHAM, Ph.D., the witness
whose deposition is hereinbefore set forth was duly
sworn by me before the commencement of such deposition
and that such deposition was taken before me and is a
true record of the testimony given by such witness.

I further certify that the adverse party,
LIBERTY ENERGY, INC. AND LIBERTY OILFIELD SERVICES LLC,
was represented by counsel at the deposition.

I further certify that the deposition of
ROBERT ALLAN DURHAM, Ph.D. occurred remotely via Zoom on
Thursday, September 11, 2025, commencing at
10:37 a.m. EDT to 12:35 p.m. EDT.

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

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1
2 IN WITNESS WHEREOF, I have hereunto set my
3 hand this 16th day of September, 2025.
4

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6 
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8 _____
9 Cassidy Western, RPR, CRR, CA CSR, WA CCR
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ACKNOWLEDGMENT OF DEPONENT

I, Robert Allan Durham, Ph.D., do hereby
acknowledge that I have read and examined the
foregoing testimony, and the same is a true, correct
and complete transcription of the testimony given by
me and any corrections appear on the attached Errata
sheet signed by me.

2025-09-26

(Date)



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