

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PERMIAN GLOBAL INC., AND

MANTICORE FUELS, LLC

Petitioners,

v.

FUEL AUTOMATION STATION, LLC,

Patent Owner.

Case IPR2023-01236

Patent No. 10,815,118

REMOTE ZOOM DEPOSITION

DEPONENT: ROBERT ALLAN DURHAM, Ph.D., P.E.
DATE: Wednesday, September 25, 2024
TIME: 10:00 a.m. CST
LOCATION: Via Remote Zoom
REPORTER: Jeanette M. Fallon, CRR/RMR/CSR-3267
JOB NUMBER: 33550

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Via Remote Zoom

Wednesday, September 25, 2024

10:00 a.m. CST

* * *

ROBERT ALLAN DURHAM, Ph.D., P.E.

having first been duly sworn, was examined and testified as follows:

CROSS-EXAMINATION

BY MR. SZYPA:

Q. Good morning, Dr. Durham.

A. Good morning.

Q. Can you state your name for the record?

A. Dr. Robert Allan, A-L-L-A-N, Durham.

Q. And where are you located today?

A. Baker Botts office in Houston.

Q. And you understand I'm conducting your deposition today remotely via Zoom?

A. Yes.

Q. And you've been deposed once in these IPR matters already; is that correct?

A. That's my recollection, yes.

MS. FLANNERY: I just want to make sure, Dr. Durham, can you hear okay now? Alex, maybe you can say something to make sure he can hear.

MR. SZYPA: Sure, test.

1 MS. FLANNERY: Okay, we just turned up the
2 volume a little bit. Thanks.

3 BY MR. SZYPA:

4 Q. Dr. Durham, is there any reason you can't give full
5 and truthful testimony today?

6 A. Not that I know of.

7 Q. Do you have any materials in front of you today?

8 A. Yes, I have a clean copy of my supplemental
9 declaration.

10 Q. And when you say clean, there's no markings or
11 annotations in there; is that correct?

12 A. Yes, that's correct, none that were not in the
13 original.

14 Q. Okay, so you have an as filed Kathy (ph), we'll say,
15 of your supplemental declaration in front of you?

16 A. Yes.

17 Q. Anything else?

18 A. No.

19 Q. You have a computer in front of you; is that right?

20 A. Well, yes, for the depo, yes.

21 Q. Sure. Do you have anything open on that computer
22 other than the Zoom platform that we're using to
23 conduct today's deposition?

24 A. No, sir.

25 Q. Ground rules, if you will, and I'd just ask that if

1 you ever don't understand a question to please let me
2 know and I'll do my best to clarify or rephrase it.
3 Is that acceptable to you?

4 A. Yes.

5 Q. And if you need a break, also please let me know. If
6 there's a question pending, though, I just ask that
7 you answer the question before we take that break. Is
8 that acceptable to you?

9 A. Sure.

10 Q. What did you do to prepare for today's deposition?

11 A. I reviewed my declaration, some other documents in the
12 case, I met with counsel yesterday for a couple hours.

13 Q. Anything else?

14 A. Nope.

15 Q. When you say other documents in the case, those would
16 be documents that were part of the filings in this
17 case?

18 A. Yes, sir. I think everything I read had been filed,
19 yes.

20 MR. SZYPA: Share Exhibit 1 on my screen.
21 (Marked for identification
22 Deposition Exhibit 1.)

23 BY MR. SZYPA:

24 Q. I'll represent to you that this is the supplemental
25 declaration that you submitted in support of the

1 petitions for IPR -- the three IPR petitions: The
2 1236, 1237, and 1238 IPRs.

3 MS. FLANNERY: And counsel, if you don't
4 mind, I mean, typically the way I understand this is
5 done and the easiest if you've got a copy of an
6 exhibit you're sharing and we don't have a paper copy,
7 that's fine, but if it can be dropped into the chat so
8 that we can go back and confirm, that would be
9 helpful, thank you.

10 MR. SZYPA: Sure. I'm having difficulty
11 doing that since I don't have permission.

12 THE COURT REPORTER: Okay, I'll go off the
13 record.

14 (Discussion off the record.)

15 BY MR. SZYPA:

16 Q. Okay, Dr. Durham, this supplemental declaration that
17 you prepared, is it the same for all three of the IPR
18 matters: 1236, 1237, and 1238?

19 A. Yes, sir.

20 Q. And did you write this supplemental declaration?

21 A. I did.

22 Q. Did counsel assist you?

23 A. I'm sure they reviewed it.

24 Q. You don't know if they reviewed it?

25 A. Well, I'm sure they did. I don't have a specific

1 recollection, but I'm sure they did.

2 Q. Did you receive any edits from counsel during the
3 review process?

4 A. Likely.

5 Q. Likely?

6 A. Yes.

7 Q. You can't recall?

8 A. Yeah. I don't have a specific recollection of it, but
9 it's likely that there were some.

10 Q. When did that take place?

11 A. In the days prior to August 26th, 2024.

12 Q. But you can't recall if counsel made any review or
13 edits of your declaration around that time?

14 A. Correct, I don't have a specific recollection, but I'm
15 sure there were.

16 Q. I'm going to direct you to paragraph 40. I'll put it
17 on the screen, but I know you have a copy in front of
18 you, too, so let me know when you get there.

19 A. Okay, I'm there.

20 Q. I'm sorry, I actually wanted paragraph 34. Same
21 thing, let me know when you get there.

22 A. Okay, I'm there.

23 Q. Okay, and the penultimate sentence of that paragraph,
24 which is on page 19, it says, "Van Vliet also already
25 included other safeguards such as override valves and

1 containment pans to mitigate problems associated with
2 spills or leaks."

3 Do you see that?

4 A. Yes, sir.

5 Q. And that's your testimony?

6 A. Yes.

7 Q. Are there any other safeguards other than the override
8 valves and containment pans in Van Vliet to mitigate
9 problems associated with spills or leaks?

10 A. Oh, I'd have to look at Van Vliet. I know -- I
11 remember those two examples, but I would have to study
12 Van Vliet to be able to answer that.

13 MR. SZYPA: Let me mark Van Vliet as
14 Exhibit 2.

15 (Marked for identification
16 Deposition Exhibit 2.)

17 MS. FLANNERY: So counsel, and I'm sorry,
18 again, I'm not trying to be --

19 MR. SZYPA: I will send this to you.

20 MS. FLANNERY: Well, and it's to me, but
21 it's also the witness. The witness needs to be able
22 to have a full copy of it. This is why -- this is why
23 the chat is usually used. I do -- I do have a copy of
24 Van Vliet, a paper copy, a clean copy. If you are
25 okay with me giving that to him, I'm okay for that

1 being the solution for this. I don't know how many we
2 can solve this way, but we can keep it moving at
3 least.

4 MR. SZYPA: That's fine. We can also give
5 him control on the screen, too, but I'm fine with
6 either.

7 MS. FLANNERY: Okay, I'm -- just let the
8 record reflect I'm handing the witness a clean copy of
9 what I understand to be Exhibit 2, Van Vliet.

10 BY MR. SZYPA:

11 Q. Dr. Durham, can you review Van Vliet and let me know
12 if there are other safeguards that you can identify?

13 A. I can.

14 THE WITNESS: Can I ask counsel for a pen
15 or a highlighter?

16 MR. SZYPA: Sure.

17 (Document review.)

18 THE WITNESS: Okay, I've completed a quick
19 review and I likely have not caught them all, but I've
20 identified several.

21 BY MR. SZYPA:

22 Q. Okay, which did you identify?

23 A. In addition to the override valves and the containment
24 pans identified in my declaration, paragraph 12
25 identifies "A fuel tank fill riser and overfill

1 protection valve are also included in the image." An
2 overfill protection valve would deal with leaks,
3 prevent them.

4 Similarly, in paragraph 15, "The tanks
5 18, 20 should be provided with anti-siphon
6 protection," which is a form of dealing with spills
7 and preventing them.

8 Further down in paragraph 15, "Hose covers,
9 such as aluminum covers (not shown), may be provided
10 for capping hoses 24 that are not connected to fuel
11 tanks 12, as a precaution in the event of a leak from
12 a hose 24 or to prevent leakage in the event fuel is
13 mistakenly sent through a hose 24 not connected to a
14 respective fuel tank 12."

15 Paragraph 17, maybe the middle of the
16 paragraph or so, "A pail (not shown) may be provided
17 at the end of line 52 in order to catch any overfill."

18 And in addition to that, the next sentence,
19 "A one-way valve may be added to the breather port,
20 for example to reduce the chance of fuel being spilled
21 through the breather port during filling of fuel tanks
22 12 on equipment such as pumpers that vibrate
23 violently."

24 In addition to that, the next sentence
25 talks about "fuel tanks 12 on violently vibrating

1 equipment may simply be restricted from filling past a
2 level relatively lower from non-vibrating equipment in
3 order to reduce spilling." That's another form of
4 dealing with spills and leaks.

5 And then additionally, the next sentence,
6 "The cap 26," identified in Figure 2, "preferably
7 seals the inlet on the fuel tank 12 except for the
8 vapor relief line." It's also a form of dealing with
9 spills and leaks.

10 Let's see. Paragraph 19, looks like the
11 second sentence, talking about the drop tube or the
12 conduit -- fill conduit that drops into the tanks 12.
13 "The conduit 27 should extend nearly to the bottom of
14 the fuel tank 12 to allow for bottom to top filling,
15 which tends to reduce splashing or mist generation."
16 And that's both to prevent and deal with spills or
17 leaks and also to reduce the possibility of static
18 electricity -- static electricity caused ignition.

19 Towards the end of paragraph 19, looks like
20 there's three more. "A pressure relief nozzle may be
21 provided on hoses 24, or at any suitable part of the
22 system in order to reduce the chance of pressure
23 release upon disconnect or connection." And that's a
24 form of dealing with spills as well.

25 "A drain --" the next sentence, additional

1 one, "A drain cock (not shown) may also be used to
2 ensure that all pipes/hoses can be drained before
3 removal." And that's a method to deal with spills and
4 leaks.

5 As is the final sentence, "Each manifold
6 may have a low-level drain."

7 Jumping to paragraph 22, first sentence,
8 "In the preferred embodiment, each hose 24 is
9 connected to a fuel outlet 22 by a dry connection 60
10 and to a cap 26 by a dry connection 62." So there's
11 dry connections on each end of the hose are a method
12 of dealing with or preventing spills and leaks. That
13 paragraph also contains spill containment pans I
14 identified in my declaration.

15 Paragraph 23 talks about a method to deal
16 with fuel spills, prevent them. Middle of the
17 paragraph or so, "Fuel spills at each fuel tank 12 are
18 prevented by providing fuel flow to each fuel tank 12
19 through the fuel caps 26 on the fuel tanks 12." So
20 specifically the ceiling cap 26 prevents spills.

21 And the final paragraph in that sentence,
22 "The emergency shut down may be provided for example
23 to shut all equipment including valves and pumps, and
24 may activate the positive air shutoff on the
25 generator." And that's a matter of dealing with

1 spills and leaks once they occur to shut down
2 equipment to stop them from continuing to leak.

3 Paragraph 24, looks like the third
4 sentence, "Using more than one manifold permits
5 redundancy in case one manifold develops a leak." So
6 that's a solution to deal with leaks.

7 Paragraph 25, looks like maybe two-thirds
8 of the way down, talks about the failsafe system. "If
9 the failsafe is set to 'close,' all systems may need
10 to be functioning in order for this system to give a
11 reading. The operator can then tell immediately
12 whether the system is functioning or not and take
13 proactive steps to resolve any issue. No fuel may
14 flow unless all systems are operating properly." And
15 that's another method to deal with preventing leaks
16 that have occurred from continuing to leak if things
17 are not functioning properly, i.e., leaking, then the
18 system will not pump.

19 Paragraph 26, similarly, about the second
20 to the last full sentence on page 3, an automated --
21 "An automatic system may be used to close the valves
22 58 automatically in the case of a high fluid level
23 detection or the operator may close the valves 58
24 using the console (not shown)." In closing the valves
25 automatically when a high fluid level is detected is a

1 method of dealing with or preventing spills and leaks.

2 So the next sentence begins another type.

3 "In the case of solenoid valves being used for the
4 valves 58, either cutting or providing power to the
5 valves 58 may be used to cause the closing of the
6 valves 58, depending on operator preference. A
7 screen --" oh, I'm sorry, no, that's -- that's
8 incorrect. Scratch that last sentence. I misread my
9 notes.

10 Paragraph 28, middle of the paragraph or
11 so, Van Vliet teaches, "For example, the system may be
12 pressured up and left overnight to check for leakage."
13 It's a method of dealing with or preventing leaks of
14 fuel.

15 And further, "A compressor (not shown) or
16 source of compressed fluid such as inert gas may be
17 provided for clearing the lines and the system of fuel
18 before transport," which is a method of preventing
19 leaks and spills.

20 Paragraph 29 talks about rotatable
21 connections in general, and then the top of the second
22 column, maybe three sentences down, "Such a rotatable
23 connection between portion 61 and top end 46 may be
24 adapted to channel pressurized fluids under seal,
25 which may be achieved with one or more bearings and

1 dynamic seals (not shown)," and the sentence goes on,
2 and conveying or channeling pressurized fluids under
3 seal with rotatable seals is a method of dealing with
4 leaks and preventing spills.

5 Similarly, in paragraph 30, "An O-ring 65
6 may be present in bottom end 57 for sealing against
7 intermediate portion 61 upon locking of camlock 53."
8 Paragraph 30 is talking about a quick connect coupling
9 to the tank of the pumping unit and that O-ring is a
10 method of preventing or dealing with spills or leaks.

11 Paragraph 31, "Valve 71 may comprise a
12 float-operated overfill shut off system, for example
13 using one or more floats 75 connected to release one
14 or more flaps 77 to block input fuel flow through drop
15 tube 73 after fuel in tank 12 has reached a
16 predetermined level or levels."

17 Paragraph 31 then goes on to say, "Other
18 overfill valve systems may be used for example time
19 domain reflectometry or contact sensors to ensure that
20 fuel tank 12 is not overfilled." Preventing the tank
21 from being overfilled is a method of preventing or
22 dealing with spills.

23 Paragraph 32 talks about, three sentences
24 in, "A gas detection system (not shown) may be used to
25 detect the presence of leaking gas." And leaking gas

1 is a method of dealing with leaks, spills.

2 Further, paragraph 10 -- I'm sorry, not
3 paragraph 10, claim 10, "The fuel delivery system of
4 claim 1 in which each hose is connected to a fuel
5 outlet by a dry connection and to a cap by a dry
6 connection," further emphasizes that method of
7 preventing spills and leaks.

8 Claim 13, "The method of claim 11 further
9 comprising preventing spills at each fuel tank by
10 providing fuel flow to each fuel tank through a fuel
11 cap on the fuel tank."

12 Twenty-three -- claim 23 again talks about
13 the overfill prevention valves that were discussed
14 earlier.

15 So in a very quick and limited review,
16 those are the ones I could identify that are
17 responsive to your question.

18 Q. Now, in your experience on a well site where the
19 system of Van Vliet would be used, what other safety
20 precautions could be taken there?

21 A. You said what -- yes, other safety precautions would
22 be taken?

23 Q. Can you give some examples?

24 A. Sure. There's tons of safety precautions at a well
25 site. There's, of course, the red zone. People are

1 not -- personnel are not allowed into the red zone
2 during pressurized pumping. There's electric safety
3 protections, there's explosion-proof equipment that's
4 used, trip hazard identification, fall hazard
5 protection, particularly for the folks operating the
6 lubricator and latching it into place. I could
7 probably go on for quite a bit, but those are some
8 examples.

9 Q. Is there usually a person in charge of safety on a
10 well site?

11 A. Often --

12 MS. FLANNERY: Object to form. Sorry, just
13 give me a second.

14 THE WITNESS: Sure.

15 A. Often there is a dedicated safety person, not all the
16 times, and I would say your -- to answer your question
17 is as with any oil and gas location, each person is
18 responsible for safety at the site.

19 BY MR. SZYPA:

20 Q. Why would one want to prevent leaks or spills at a
21 well site?

22 MS. FLANNERY: Object to form.

23 A. I can identify a few of the reasons, I probably can't
24 come up with them all off the top of my head, but the
25 first two come to mind are it's a safety hazard,

1 creates a slippery surface and/or an ignition hazard,
2 and the other would be it's expensive to remediate
3 spills or it can be.

4 BY MR. SZYPA:

5 Q. If there was a fuel spill on a well site, what are the
6 potential outcomes of that fuel spill?

7 MS. FLANNERY: Object to form.

8 A. I think it's basically the same answer I gave before,
9 I can identify some, it's a safety risk, so potential
10 outcome is someone could slip on a slippery surface,
11 there's an ignition hazard, there's a potential of
12 ignition, and there's a high likelihood that you would
13 have to remediate that spill, remediate the soil that
14 was affected by a spill and cleaning the equipment
15 that was contaminated.

16 THE WITNESS: And with that, my water glass
17 says we've been going maybe about 50 minutes, so when
18 you get a chance, it would be a good chance for a
19 break.

20 MR. SZYPA: Okay, I just have a few
21 follow-up questions.

22 BY MR. SZYPA:

23 Q. Could the operation be shut down in response to a fuel
24 spill?

25 MS. FLANNERY: Object to form.

1 A. It's a possibility.

2 BY MR. SZYPA:

3 Q. Could there be monetary fines?

4 MS. FLANNERY: Object to form.

5 A. I guess that's a possibility. I would expect that the
6 remediation would prevent the fines, that's been my
7 experience, but it's a possibility, I guess.

8 BY MR. SZYPA:

9 Q. What about ejection of the person or company
10 responsible for the spill?

11 MS. FLANNERY: Object to form.

12 A. What about it?

13 BY MR. SZYPA:

14 Q. Is that a possible outcome of a fuel spill?

15 A. If you're asking if it's possible, the answer is going
16 to be yes, possibly.

17 Q. Would you agree that safety is a chief concern on a
18 well site?

19 A. I would agree.

20 Q. Do you agree that a safety incident on a well site
21 could result in life-threatening or fatal injuries?

22 MS. FLANNERY: Object to form.

23 A. It could.

24 MR. SZYPA: I think -- if you want to take
25 a break, I think this is a good point to do so.

1 THE WITNESS: Okay.

2 MS. FLANNERY: Go off the record.

3 (A brief recess was taken;

4 10:51 a.m. to 10:58 a.m.)

5 BY MR. SZYPA:

6 Q. Okay, Dr. Durham, what is a safety factor?

7 MS. FLANNERY: Object to form.

8 A. In what -- in what regard? I can think of a couple
9 different definitions for safety factor.

10 BY MR. SZYPA:

11 Q. Sure. How about this. In footnote 41 of Exhibit 1,
12 you mention a safety margin. What's a safety margin?

13 A. A safety margin, in the way I used it in this
14 footnote, is a margin below a limit that you would
15 choose to operate in order to avoid reaching or
16 exceeding that limit. In this case, the example I
17 gave was fracturing iron with 15,000 psi rating is
18 very often operated about 13,000, 13,500, which is a
19 10 percent safety margin below the rating of 15,000.

20 Q. Now, is that -- are you using that differently than
21 the way you know the term safety factor to be commonly
22 used?

23 MS. FLANNERY: Object to form.

24 A. I think safety factor and safety margin have very
25 similar definitions when used in this context.

1 BY MR. SZYPA:

2 Q. Would there be any differences?

3 MS. FLANNERY: Object to form.

4 A. Well, safety factor sometimes is a multiplier -- well,
5 that's still a percentage. So I think in this
6 context, I think they have very similar meanings, very
7 similar meanings to a POSITA.

8 BY MR. SZYPA:

9 Q. Are there other context in which the term safety
10 factor is used differently to your knowledge?

11 A. Certainly.

12 MS. FLANNERY: Object to form.

13 A. Yeah, certainly.

14 BY MR. SZYPA:

15 Q. And what are those?

16 A. When you're examining, for example, the hierarchy of
17 safety, a safety factor is a method that you put in
18 place, an engineering control, for example, in order
19 to prevent or reduce the chance of an injury, so
20 that's a very certain and different definition. There
21 may be others. Those are two I can think of right off
22 the top of my head.

23 Q. So would a designer of a refueling system like
24 Van Vliet's account for a certain safety factor or
25 safety margin in order to design a safe system?

1 MS. FLANNERY: Object to form.

2 A. I would expect that the designer would take that into
3 account, yes.

4 BY MR. SZYPA:

5 Q. Direct you to paragraph 16 of Exhibit 1, which is your
6 supplemental declaration. Please let me know when you
7 get there.

8 A. Okay, I'm there.

9 Q. The first full sentence on page 9, you testified that
10 "Both now and before the Challenged Patents were
11 filed, many service companies would focus their
12 operations in particular regions of the country in
13 order to control their business costs."

14 Do you see that?

15 A. Yes.

16 Q. And that's your testimony?

17 A. Yes, that's my experience.

18 Q. How would that control their business costs?

19 A. How would -- can you rephrase the question?

20 Q. Sure. How would focusing operations in particular
21 regions of the country control business costs?

22 A. Okay, I think the most readily apparent is you have
23 fewer pieces of equipment, fewer pieces of redundant
24 equipment you have to invest capitally and maintain,
25 you have lower personnel costs, you have easier

1 oversight and management, lower administrative costs
2 more likely than not. Those are some examples I can
3 think of.

4 Q. Anything else?

5 A. Well, that's what I can think of off the top of my
6 head.

7 Q. And this statement that you make about controlling
8 business costs is supported by what?

9 MS. FLANNERY: Object to form.

10 A. Well, that's -- not sure how to answer your question.
11 That's my experience in the oil and gas industry is
12 that statement is accurate.

13 BY MR. SZYPA:

14 Q. So based on your personal experience?

15 A. Well, I would say my professional experience -- well,
16 both personal and professional.

17 Q. What professional experience do you have with
18 controlling business costs for service companies in
19 the oil and gas industry?

20 A. Well, for example, our well operations that we operate
21 are limited to three counties in Oklahoma in order to
22 control those business costs. The same concept would
23 apply to a service company. I've also seen and been
24 very experienced with service companies that are only
25 located in certain regions or certain portions of

1 certain states so that they don't have those
2 additional administrative costs and overhead and
3 duplication of equipment, travel costs, things like
4 that.

5 Q. And so you know that those companies are only
6 operating regionally to control administrative costs
7 and overhead and duplication of equipment?

8 MS. FLANNERY: Object to form.

9 A. Well, I'm not sure that's the only reason, but I do
10 know that is a result of that decision.

11 BY MR. SZYPA:

12 Q. So that's a result of a decision, but it's not
13 necessarily the reason that they're operating
14 regionally?

15 MS. FLANNERY: Object to form.

16 A. Well, I can't answer for every service company that
17 only chooses to operate regionally, but I know that
18 operating regionally does control business costs.
19 It's really not that hard.

20 BY MR. SZYPA:

21 Q. Can you give me an example of service providers that
22 focus their operations regionally?

23 A. Could you repeat the question? I missed the front
24 end.

25 Q. Sure. Could you name any example of service providers

1 related to the industry of the Van Vliet system that
2 focus their operations regionally?

3 A. Sure. Any variety of electric service companies, for
4 example, like Max Electric that works in the oil and
5 gas industry out of, I believe, Midland, they focus
6 regionally, they're not willing to travel to different
7 parts of the country, Oklahoma in particular I know
8 for sure. BJ Hot Oil Service only operates regionally
9 in the Anadarko Basin area. Cud Pressure Control, at
10 least the last time I was involved with them maybe
11 four, five, six years ago, only operated in the
12 Mid-Continent region. Those are some that come to
13 mind off the top of my head. Certainly not an
14 exhaustive list.

15 Q. And those companies offer fuel delivery systems
16 similar to those disclosed in the Van Vliet reference?

17 MS. FLANNERY: Object to form.

18 A. Well, that was not your question. Your question was
19 involved with the industry of Van Vliet, which would
20 be the oil and gas industry.

21 BY MR. SZYPA:

22 Q. Okay, how about fuel delivery system providers?

23 A. I would have to study that question to be able to
24 answer that better. I'm not -- I haven't prepared for
25 that question.

1 Q. So sitting here today, you're not aware of any?

2 A. No, I would -- I don't know whether I am or not. I've
3 never studied that question.

4 Q. So when you say many service companies would focus
5 their operations in particular regions of the country
6 in order to control their business costs, you're not
7 saying that in regard to a specific fuel delivery
8 system provider that you're aware of that does that?

9 MS. FLANNERY: Object to form.

10 A. That's a general statement and a POSITA will
11 understand service company to include service
12 companies in the oil and gas industry and so that's a
13 general statement regarding that.

14 BY MR. SZYPA:

15 Q. But based on that general statement, you don't have
16 any specific examples of fuel delivery system
17 providers that operate in a particular region of the
18 country in order to control their business costs?

19 MS. FLANNERY: Object to form.

20 A. No, I couldn't name one off the top of my head without
21 studying that question.

22 BY MR. SZYPA:

23 Q. That's not something you studied before preparing your
24 report?

25 A. Correct.

1 Q. Some of the examples of other service providers that
2 you gave before, what regions did you say they would
3 focus on?

4 A. It varies from provider to provider. Some are limited
5 to a particular area like the Anadarko Basin, some
6 are -- a larger area, the Mid-Continent area, some are
7 the Permian itself.

8 Q. And those would include Texas; right?

9 A. Well, the Permian includes Texas, the Mid-Continent
10 region includes Texas, Anadarko does not of the
11 examples I gave.

12 Q. Has it ever snowed in Texas to your knowledge?

13 A. Yes, Texas is a big place.

14 Q. What about in any of those regions that you previously
15 mentioned, has it ever snowed there?

16 A. Yes.

17 Q. So the temperature would have fallen below freezing in
18 those regions?

19 A. Well, that's certainly not a predicate for snow, so
20 no, I can't say that based on your statement, based on
21 your question.

22 Q. Okay, you're not aware of the temperature in any of
23 those regions ever falling below zero?

24 A. Oh, in any of those regions ever falling below zero?
25 Yes.

1 Q. Are you familiar with the company Halliburton?

2 A. Yes, I am.

3 Q. Do they limit their services only to warm locations?

4 A. No.

5 MS. FLANNERY: Object to form.

6 A. No, they do not.

7 BY MR. SZYPA:

8 Q. How about Schlumberger?

9 MS. FLANNERY: Same objection.

10 A. I don't have as much experience with Schlumberger, but
11 I would expect not.

12 BY MR. SZYPA:

13 Q. Baker Hughes?

14 MS. FLANNERY: Same objection.

15 A. No, definitely not.

16 BY MR. SZYPA:

17 Q. ConocoPhillips?

18 MS. FLANNERY: Same objection.

19 A. Well, ConocoPhillips is not a service company, so I
20 can't answer that question.

21 BY MR. SZYPA:

22 Q. What does ConocoPhillips do?

23 A. They're an oil and gas operator, refining,
24 distributor.

25 Q. Do they only operate in warm climates?

1 A. I don't know the answer to that. I don't know of all
2 of ConocoPhillips' operating regions.

3 Q. How about Nabors Industries?

4 A. I've never -- I've never looked at Nabors to see
5 whether they're only regionally or whether they
6 operate in cold regions.

7 Q. How about EOG Resources?

8 A. Sitting here today, I'm not familiar with that
9 company. I may be, I just don't recall it.

10 Q. Direct you to paragraph 19 of your declaration in
11 Exhibit 1, and please let me know when you get there.

12 A. Okay. I'm there.

13 Q. See where -- well, I guess it's just one sentence, but
14 you say, "It would have been well within the skill of
15 a POSITA to replace the AFLAS seal with a commercially
16 available alternative seal made of a material that
17 could withstand the temperatures such as the nitrile
18 alternative disclosed in Coxreels."

19 Do you see that?

20 A. Yes, sir.

21 Q. And that's your testimony?

22 A. It is.

23 Q. What's the useful temperature range of a nitrile seal?

24 A. I don't have that at my fingertips.

25 Q. You didn't include that in your report; right?

1 A. I did not, no.

2 Q. And what did you cite as support for this statement in
3 your report?

4 A. The statement that it's well within the scope of a
5 POSITA? My experience as a POSITA.

6 Q. Based on your experience as a POSITA?

7 A. Sure, yeah.

8 Q. And you are a POSITA?

9 A. Of course.

10 Q. Are you more than a POSITA?

11 A. I'm sorry, could you repeat that?

12 Q. Do you have more skill than a POSITA?

13 A. I would say my experience exceeds the limits of what a
14 POSITA would have; the lower limit, not the upper
15 limit.

16 Q. So this statement was based on your experience as a
17 POSITA, but you didn't include any useful temperature
18 range for nitrile in your declaration?

19 MS. FLANNERY: Object to form.

20 A. I did not include a nitrile temperature range, no.
21 And my statement's not intended to be limited to
22 nitrile, it's just an example. It would be well
23 within the scope of a POSITA to replace any seal that
24 had undesirable operating characteristics with another
25 seal that had desirable operating characteristics may

1 be a better way to say paragraph 19.

2 BY MR. SZYPA:

3 Q. But that's not what you said; right?

4 MS. FLANNERY: Object to form.

5 A. That was my intent. Maybe I didn't get the right
6 words on the page, but that was my thoughts when I
7 wrote the paragraph.

8 BY MR. SZYPA:

9 Q. The only specific example you gave was the nitrile
10 alternative; correct?

11 A. Yeah, that's one example.

12 MR. SZYPA: I would like to mark the
13 Coxreels reference as Exhibit 3.

14 (Marked for identification
15 Deposition Exhibit 3.)

16 MR. SZYPA: Matt, if you're on, I still
17 can't drop exhibits into the chat, maybe you can. I
18 labeled it in the exhibit folder. Liz, I don't know
19 if you guys have a copy of Coxreels in front of you.
20 I can put it on the screen, I can let Dr. Durham
21 scroll through it.

22 MS. FLANNERY: It looks like Matt has
23 backed you up. It looks like he put it in the chat so
24 if that's good for you, Dr. Durham. You may need to
25 give him a second to download it.

1 MR. SZYPA: Sure.

2 THE WITNESS: It's not letting me open that
3 file. I don't know if it's corrupted maybe or what
4 the deal is, but --

5 THE COURT REPORTER: May I go off for just
6 a moment?

7 MS. FLANNERY: Yes, off the record.

8 (Discussion off the record.)

9 BY MR. SZYPA:

10 Q. Dr. Durham, so you have Coxreels reference in front of
11 you?

12 A. I do.

13 THE COURT REPORTER: This one is 1005 on
14 the screen. Same document?

15 MS. FLANNERY: The one he has is marked
16 1008.

17 THE WITNESS: It's probably from a
18 different IPR.

19 MS. FLANNERY: I mean, I defer to you on
20 what you want to do there.

21 THE WITNESS: It appears to be the same
22 document to me.

23 BY MR. SZYPA:

24 Q. You use the same Coxreels reference throughout the
25 three IPRs; correct?

1 A. Yes, that's my recollection, it was the same.

2 MR. SZYPA: So I'm fine, I have 1005 on the
3 screen, he has 1008 in front of him, I don't see any
4 issue to that. I guess, Liz, if you have an issue.

5 MS. FLANNERY: I don't have any objection
6 to proceeding on this basis presuming that they are
7 both the same.

8 MR. SZYPA: Okay.

9 BY MR. SZYPA:

10 Q. So Dr. Durham, which models of the Coxreels 1125
11 series reel have nitrile seals?

12 A. Those models that are not 1 inch I.D.

13 Q. And 1 inch I.D. would be -- if you look at the list of
14 the model numbers in Coxreels, when you say 1 inch
15 I.D., you're referring to the measurement listed in
16 the fourth column there?

17 A. Yes, sir, the one marked I.D.

18 Q. Well, there's another I.D. --

19 A. Oh, well --

20 Q. I just want to make sure that --

21 A. Well, the same. I mean, the optional capacity --
22 well, okay, you're talking about model numbers, yes,
23 it's the model numbers from that fourth column
24 capacity, not the optional capacity.

25 Q. So anything that doesn't have 1 inch in the fourth

1 column here would have a nitrile seal?

2 A. Yes, that's the way I understand a POSITA would
3 understand Coxreels to state. It's a bad way to put
4 it. It's how a POSITA would read Coxreels.

5 Q. Now, in your testimony in these IPRs, you haven't
6 identified a specific Coxreels reel that you are
7 proposing would be combined with the Van Vliet
8 reference; correct?

9 A. Correct, it's the teachings of Coxreels that I'm
10 relying on, not a particular model, just the overall
11 teachings, particularly the teachings of a fluid flow
12 path going through the spindle of the reel and then
13 onto the hose.

14 Q. Okay, so you're not proposing in this matter that a
15 specific Coxreels reel would be incorporated into
16 Van Vliet's mobile fuel delivery system?

17 A. Correct. It's the teachings of Coxreels that are
18 important.

19 Q. Okay, it's not your position that it would have been
20 obvious for a POSITA to incorporate a specific
21 Coxreels reel into Van Vliet's mobile fuel delivery
22 system?

23 A. Right.

24 MS. FLANNERY: Form.

25 A. Although they certainly could, but that's not -- that

1 was not the goal of my testimony.

2 THE COURT REPORTER: Ms. Flannery, if you
3 could just be a little louder when you object.

4 MS. FLANNERY: Will do.

5 (Discussion off the record.)

6 BY MR. SZYPA:

7 Q. Do any of the Coxreels 1125 series models have a seal
8 other than nitrile or AFLAS?

9 A. Based on what's stated in Coxreels, I don't believe
10 so. At least not these that are covered on this
11 document.

12 Q. I would like to direct your attention now to
13 paragraphs 17 and 18 of Exhibit 1. Please read them
14 to yourself and then let me know when you've finished.

15 A. Okay, I've read 17 and 18.

16 Q. In paragraph 18 you refer to something that you called
17 a cloud point. Can you explain what that is?

18 A. Sure, cloud point of diesel is the temperature at
19 which small paraffin crystals begin to form in the
20 diesel.

21 Q. Okay, and what is the pour point, which is another
22 term that you utilize in this paragraph?

23 A. Pour point is the temperature below which the diesel
24 will not flow, so the idea it won't even pour out of a
25 container because the paraffin crystals have gotten so

1 dense that it's no longer liquid.

2 Q. That also sometimes referred to as the gel point?

3 A. Gel point can refer to either one depending on who's
4 using it, but yes, when we say -- when it's gotten
5 below the pour point, we see the diesel has gelled, as
6 opposed to the cloud point where the diesel is
7 gelling, but colloquially gel is used for either one.

8 Q. And when you say either one, I guess to be clear,
9 you're saying that gel point can be used to describe
10 either one of the cloud point or the pour point?

11 A. Yes, and that's why I chose the terms that I did,
12 which are more precise.

13 Q. Is there a relationship between the cloud point and
14 the pour point?

15 A. Yes, it depends on the specific mix, but they're
16 usually about 10 degrees C apart.

17 Q. You meaning that the pour point would be, I guess,
18 10 degrees Celsius less than the cloud point
19 typically?

20 A. Typically that's the case. Like I said, it depends on
21 the blend and what additives are in, but as a rule of
22 thumb kind of measure, that's pretty good.

23 Q. Their blend and additives can affect the pour points
24 and/or cloud point of the fuel?

25 A. Yes, you can put additives in that would lower the

1 cloud point and lower the pour point, just like you
2 can add additives that will prevent degradation from
3 brass or copper fittings. So the same concept
4 applies, it depends on what additives you want to add
5 to the fuel. This minus 3 C and minus 12 C are
6 examples of a standard diesel blend. Just diesel by
7 itself, just diesel by itself unblended I should say.

8 Q. Is that common practice in the oil and gas industry in
9 your experience to put additives into the fuel to
10 lower the cloud point and the pour point?

11 A. I would say it's common in the oil and gas industry to
12 use what additives are necessary to use whatever
13 materials you want to use. So in some cases that may
14 be involved using additives, additives are more
15 expensive, so you certainly don't want to use them
16 when you can take other measures, but it's done, sure.

17 Q. Sorry, so you said use what additives are necessary to
18 use whatever materials you want to use. Can you
19 clarify that? I don't really understand that.

20 A. Yeah, several examples. For example, if you want to
21 use water for fracturing below about zero degrees C,
22 then you're going to want to add glycols or other
23 additives to lower the freezing point of water, maybe
24 even a saline solution to lower the freezing point of
25 water some. If you're going to use diesel and know

1 it's going to be exposed to temperatures below about
2 10 degrees C or so or even 3 degrees C, then you'll
3 probably want to add some additives to lower those
4 points. You know, if you want to use a fuel in a
5 storage -- long-term storage or extreme temperatures
6 where it's exposed to brass or copper fittings and
7 you're concerned about that accelerated degradation of
8 fuel, you would add additives to prevent that. So the
9 concept in general, if there's a chemical solution,
10 sometimes you may want to use it; if there's a
11 mechanical solution, sometimes you may want to use
12 that.

13 Q. Sometimes you may want to use both?

14 A. Depends. That's a design choice. Sure.

15 Q. Now, specific to diesel -- the diesel example you
16 mentioned, is that common practice in the industry to
17 add additives to the diesel to lower the gel point?

18 A. That's one of the options that a designer would take
19 into account or an operator would take into account.
20 That's a chemical solution.

21 Q. Is that common practice in the industry in your
22 experience?

23 A. I don't know what you mean by common. I would say
24 that they are used when desired.

25 Q. Direct you to paragraph 17. And actually it will be

1 the final sentence of that paragraph, which is at the
2 top of page 10. Do you see where it says, "To the
3 contrary, with pumps and other equipment giving off
4 heat in the enclosed trailer, I would expect the
5 temperature in the area surrounding the reels to
6 remain above freezing."

7 Do you see that, sir?

8 A. Yes, sir.

9 Q. Okay, and that's your testimony?

10 A. Yes.

11 Q. What other equipment were you referring to?

12 A. Well, it depends. It's a mechanical solution, right?
13 So maybe it's an intrinsically safe heating element or
14 at least a heating element appropriate for the
15 environment that it's in with a diesel fuel
16 particularly down low, the diesel vapors, it would
17 just be a reasonable practice to expect the area
18 around the reels which have to spin and the areas
19 around the other mechanical equipment such as the
20 pumps that the designer would take that into account,
21 I mean, keep those above freezing, that would be my
22 expectation.

23 Q. A designer may use the pump to do that?

24 A. Well, there is heat that comes off from the pump --
25 well, more specifically, the motor of the pump, and

1 you would take that into account, sure.

2 Q. Would that be, I guess, heat that radiates from the
3 pump, is that what you're referring to?

4 A. From the motor primarily. There is a little bit of
5 heat on the pump, but there's more joules of energy
6 that are released from the motor.

7 Q. Okay, so here you're referring to heat that radiates
8 from the motor of the pump?

9 A. Right. There is some from the pump but more than the
10 motor. Usually, all things being equal, and
11 everything working properly.

12 Q. So in this sentence were you referring to --
13 specifically to equipment that is disclosed in
14 Van Vliet?

15 A. A portion of it, yes. There is heat that comes from
16 the pump and motors in a lot of cases that's going to
17 be enough. If it's not enough, you would expect the
18 designer to take that into account.

19 Q. And you have Van Vliet in front of you; correct?

20 A. I do.

21 Q. What other equipment other than the pump would radiate
22 heat within the trailer in Van Vliet?

23 A. Again, that's a study question, I have to reread
24 Van Vliet with that in mind.

25 Q. So you have to --

1 A. Certainly the pump and motor for the pump are
2 examples, but I -- there's probably other examples.

3 Q. How much heat would radiate from the pump used in
4 Van Vliet?

5 A. That would depend on the pump and motor selected.

6 Q. Not a calculus that you did in preparing your
7 declaration; right?

8 A. Correct. There's no specific pump. Although there's
9 some examples in Van Vliet, there's -- the teachings
10 of Van Vliet could not only apply to one pump or one
11 sides pump so that would depend on the -- depend on
12 the pump, depend on the motor, depend on the rest of
13 the equipment.

14 Q. Would a larger pump give off more heat?

15 A. All else being equal, a larger pump requires larger
16 motors so the package would release more heat, yes.

17 Q. Would a --

18 A. All else being equal.

19 Q. Would a designer choose a larger pump then to radiate
20 more heat within a trailer?

21 A. I can't speak to what any particular designer would
22 do. That's an option.

23 Q. You can't speak to what a designer would do?

24 A. What any --

25 MS. FLANNERY: Object to form. Sorry, just

1 give me --

2 A. What any particular designer may do.

3 BY MR. SZYPA:

4 Q. Okay. How much heat would the other equipment that
5 you mention radiate within the trailer of Van Vliet?

6 A. Well, I mentioned heating equipment, so the answer
7 would be whatever is necessary for the designer to
8 maintain appropriate temperature.

9 Q. You can't speak to what a particular designer may do;
10 right?

11 MS. FLANNERY: Object to form.

12 A. Right. That's not -- that's not my analysis what any
13 particular designer may do. There's lots of engineer
14 design options and I believe even Van Vliet talks
15 about implementation decisions, if not certainly a
16 POSITA would understand that there are various options
17 in how to apply the teachings of Van Vliet in any
18 particular environment. Van Vliet's not limited to
19 any particular -- it's not an arctic reference, for
20 example, it's not teaching only a reference that would
21 go into an arctic environment, so he leaves those
22 decisions to the designer.

23 BY MR. SZYPA:

24 Q. Here are you referring to equipment that isn't
25 disclosed in Van Vliet that a designer may choose to

1 incorporate into Van Vliet's trailer?

2 A. Under the right circumstances, yes, I would say that
3 there are equipment that is well-known to a POSITA
4 such as heating equipment for classified areas that
5 under any given circumstances would look to other
6 references to find out how to deal with cold, for
7 example. Van Vliet doesn't deal with cold, so a
8 POSITA would look to other references to see how to
9 deal with cold.

10 Q. What's the volume inside the trailer of Van Vliet?

11 A. Van Vliet's teachings are not limited to a particular
12 size.

13 Q. Not a calculation you made in preparing your
14 declaration?

15 A. Well, that would be an impossible calculation to make
16 since Van Vliet doesn't disclose a size. Van Vliet
17 gives some examples of some things that may be useful,
18 but it's not exhaustive.

19 Q. Is there heat loss through the trailer walls of
20 Van Vliet?

21 A. As a general engineering question, I can say the
22 answer is yes, there is some heat loss.

23 Q. And Van Vliet discloses openings, at least one
24 opening, in its trailer walls; correct?

25 A. Yes.

1 Q. And that's an area where there would likely be heat
2 loss; correct?

3 A. Sure, yeah, that's a standard calculation for that
4 heating calculation.

5 Q. How far is the hose reel from the pump in Van Vliet?

6 A. Again, I don't recall that Van Vliet makes any
7 measurements or gives any dimensions, and in fact, I
8 think he says the spacial orientation of all the
9 equipment is left up to the designer.

10 Q. How much would the interior temperature of the trailer
11 vary from the vicinity of the pumps, to the farthest
12 hose reel from the pumps?

13 A. Again, that's not a calculation that can be made
14 without the specific dimensions of the specific
15 environment that the designer's operating in. Spacial
16 orientation of equipment and size is left up to the
17 designer.

18 Q. It's not a calculation you've made in preparing your
19 declaration; right?

20 A. It's not a calculation that could possibly be made
21 based on the teachings of Van Vliet.

22 Q. It's an impossible calculation then?

23 MS. FLANNERY: Object to form.

24 A. Based solely on the teachings of Van Vliet, yes,
25 because Van Vliet does not provide dimensions, as an

1 example.

2 BY MR. SZYPA:

3 Q. What information would you need to have to make that
4 calculation?

5 A. All of the available data regarding the trailer, the
6 trailer walls, the openings, what options were added
7 by the designer, the size of the trailer, all of the
8 available data is the answer.

9 Q. What if there was a door on the trailer of Van Vliet,
10 how would that impact the inside temperature of the
11 trailer?

12 MS. FLANNERY: Object to form.

13 A. It depends. Depends on where and what the door was.

14 BY MR. SZYPA:

15 Q. What if there's a door at the front of the trailer,
16 how would that impact the temperature of the inside of
17 the trailer?

18 MS. FLANNERY: Object to form.

19 A. Again, it would depend on the composition of the door,
20 the size of the opening, the location of the door
21 relative to prevailing winds, a lot of questions like
22 that. But again, those are just standard heat loss
23 calculations.

24 BY MR. SZYPA:

25 Q. You would need that information to calculate the heat

1 loss caused by the door?

2 A. Yes --

3 Q. But at least there would be some --

4 A. -- at least --

5 MS. FLANNERY: Wait, let him finish his
6 answer, please.

7 A. At least that information. You know, there's other
8 seals, there's lots of things that would go into that
9 question.

10 BY MR. SZYPA:

11 Q. But you would agree there would be some heat loss
12 caused by incorporating a door into the trailer of
13 Van Vliet; correct?

14 MS. FLANNERY: Object to form.

15 A. Not necessarily any more heat loss than would be
16 through the wall material. It depends on, again, the
17 type and size of the door, its location, the seals,
18 etc. You can have a door that provides exactly the
19 same heat insulating factor that an unbroken wall
20 would.

21 BY MR. SZYPA:

22 Q. If that door were to remain closed; right?

23 A. Sure.

24 Q. What if the door is opened?

25 MS. FLANNERY: Object to form.

1 A. Well, if the door's open, you're going to have heat
2 transfer between the inside and the outside.

3 BY MR. SZYPA:

4 Q. And you would typically put a door in a structure so
5 that it can be opened at some point; correct?

6 MS. FLANNERY: Object to form.

7 A. I would say that's a typical use of a door, right,
8 and -- correct.

9 BY MR. SZYPA:

10 Q. Does Van Vliet disclose that its fuel is stored within
11 the trailer of its refueling system?

12 MS. FLANNERY: Object to form.

13 A. That's at least one example in Van Vliet, yes.

14 BY MR. SZYPA:

15 Q. Does it have to be stored on the trailer?

16 MS. FLANNERY: Same objection.

17 A. No.

18 BY MR. SZYPA:

19 Q. So it could be stored externally to the trailer?

20 A. Yes, Van Vliet teaches that.

21 Q. And in that example, if the fuel is first stored
22 external to the trailer and then routed into the
23 trailer, how long would that fuel have to stay within
24 the trailer to remain above its gel points?

25 MS. FLANNERY: Object to form.

1 A. Well, you would expect that fuel to be above its gel
2 point before it's pumped into the trailer of
3 Van Vliet.

4 BY MR. SZYPA:

5 Q. Why is that?

6 A. To prevent clogging of filters and other equipment
7 that would clog in the event of the paraffin crystals
8 being in the fuel.

9 Q. So how would you do that with an external fuel source
10 being used?

11 A. External heating or additives or keeping it in a warm
12 environment. Again, there's mechanical solutions,
13 there's chemical solutions.

14 THE WITNESS: And again, my water glass is
15 empty, so I'm thinking we're pretty close to an hour
16 or so.

17 MR. SZYPA: Okay, I think it makes sense to
18 take a break here. Should we --

19 MS. FLANNERY: Let's go off the record.

20 THE COURT REPORTER: Okay.

21 (Discussion off the record.)

22 (Luncheon recess between

23 11:51 a.m. and 12:30 p.m.)

24 (Mr. Rodgers not present.)

25 BY MR. SZYPA:

1 Q. Dr. Durham, I would like to direct you to again
2 Exhibit 1, your supplemental declaration, particularly
3 paragraph 17. Let me know when you get there.

4 A. Okay, I'm still there.

5 Q. First sentence, you testify, "Even in climates that
6 experience temperatures below negative 3 degrees
7 Celsius more regularly, a POSITA would not have
8 expected temperature inside the enclosed trailer of
9 Van Vliet (where the reels are located) would drop
10 below negative 3 degrees Celsius for sufficiently long
11 period of time to compromise the integrity of the
12 AFLAS seal."

13 Do you see that?

14 A. Yes.

15 Q. That's your testimony?

16 A. I wrote that, yes.

17 Q. What's a sufficiently long period of time?

18 A. A sufficiently long period of time where the AFLAS
19 itself is below negative 3 degrees C in order for it
20 to transition to a brittle -- a glass transition
21 state, a brittle state.

22 Q. Have you quantified that?

23 A. No, it would depend on what previous temperatures were
24 there. Of the point I'm making here, like we said
25 earlier, a POSITA would have expected the interior of

1 the trailer to stay above freezing and would expect
2 the designer of the trailer to maintain that
3 temperature above freezing for all the reasons I
4 talked about earlier.

5 Q. You didn't quantify or calculate that sufficiently
6 long period of time that you mentioned?

7 A. Yeah -- well, correct. Because the temperature's
8 above freezing, it's not going to be below negative 3
9 for a sufficiently long period of time to damage the
10 seal.

11 Q. Okay, and you don't know what that sufficiently long
12 period of time is, you just know that a POSITA would
13 not have expected the temperature to be below 3 --
14 negative 3 degrees Celsius for that period of time?

15 A. Well, right. I mean, you may have a momentary -- for
16 example, as you're opening the door or whatever where
17 the air temperature inside the trailer may drop below
18 negative 3 C, but that doesn't mean it's sufficiently
19 long for the seal to get below negative 3 C. The
20 temperature maintained above zero would prevent that
21 sentence from occurring.

22 Q. So again, you haven't quantified that amount of time
23 that you're stating would be sufficient?

24 MS. FLANNERY: Object to form.

25 A. It's -- no, I haven't quantified it. Qualitatively, I

1 would say it's the amount of time necessary for the
2 heat to dissipate from the seal into a below freezing
3 environment because the trailer's maintained above
4 freezing.

5 BY MR. SZYPA:

6 Q. Do frac jobs only operate during the daytime?

7 A. No, definitely not.

8 Q. Where exactly in the United States land market would
9 you expect to be able to ensure temperatures above
10 negative 3 degrees Celsius?

11 MS. FLANNERY: Object to form.

12 A. I think I identified the South Texas region in
13 paragraph 16 as an example.

14 BY MR. SZYPA:

15 Q. And you haven't --

16 A. So, I mean, that's -- I mean, you have a lot of
17 offshore stuff that's never going to see freezing
18 temperatures, but the point I'm making is, look,
19 you're not going to design the same trailer in South
20 Texas as you are in the Bakkan region. There are
21 going to be differences in the way you design the
22 equipment.

23 Q. I'm sorry, you said that's the point you're making.
24 Where are you making that point?

25 A. Paragraph 16.

1 Q. I'm talking about paragraph 17, though.

2 A. Well, you can't take 17 without 16.

3 Q. So besides South Texas, are there any other areas in
4 the US land market that you would expect to be able to
5 ensure temperatures above negative 3 degrees Celsius?

6 MS. FLANNERY: Object to form.

7 A. Oh, let me think. You said land. Portions of
8 New Mexico you can probably do that -- maybe not --
9 maybe not New Mexico because of the mountainous
10 regions, but certainly very, very rarely in certain
11 portions of New Mexico below freezing. The
12 Bakersfield fields, you expect those to stay above
13 freezing all the time. And off the top of my head,
14 those are some I can identify. I identified
15 South Texas as an example in paragraph 16.

16 BY MR. SZYPA:

17 Q. Anything else?

18 A. Anything else what?

19 Q. Can you identify any other examples?

20 A. Those are the ones I can identify off the top of my
21 head.

22 Q. Are there any examples of regions where a POSITA would
23 not expect to be able to ensure temperatures above
24 negative 3 degrees Celsius?

25 A. I think I maybe --

1 MS. FLANNERY: Object to form.

2 A. I may have got lost in that question. Could you
3 rephrase it?

4 BY MR. SZYPA:

5 Q. I previously asked you for examples of regions where a
6 POSITA would expect to be able to ensure temperatures
7 above negative 3 degrees Celsius; correct? Is that
8 correct?

9 A. That's the way I understood your question, yes.

10 Q. Okay, so now I'm asking you for examples where a
11 POSITA would not be able to expect to ensure those
12 temperatures above negative 3 degrees Celsius?

13 MS. FLANNERY: Object to form.

14 A. I'm going to answer your question with this
15 understanding of your question, that a POSITA would
16 expect to see temperatures below negative 3. Is that
17 a fair characterization of your question?

18 BY MR. SZYPA:

19 Q. Yes.

20 A. Okay, the Bakkan region is a good example, Colorado
21 Fields, the -- Pennsylvania and those shale regions up
22 there probably another good example. Those are some
23 examples of currently productive regions.

24 THE WITNESS: And for the reporter, Bakkan
25 is B-A-K-K-A-N.

1 THE COURT REPORTER: Thank you.

2 BY MR. SZYPA:

3 Q. So again, in paragraph 17 you talk about the
4 temperature inside the enclosed trailer of Van Vliet
5 would drop below negative 3 degrees Celsius for a
6 sufficiently long period of time to compromise the
7 integrity of the AFLAS seal. I want you to assume
8 that the AFLAS seal has in this example been exposed
9 to cold temperatures for a sufficiently long period of
10 time to compromise its integrity. What would happen?

11 MS. FLANNERY: Object to form.

12 A. What would happen is it would depend on a lot of
13 things, but one of the possibilities is the seal could
14 become brittle enough that it could fracture and cause
15 a leak.

16 BY MR. SZYPA:

17 Q. How would that affect the performance of the seal?

18 MS. FLANNERY: Same objection.

19 A. Well, it's leaking, it's not sealing.

20 BY MR. SZYPA:

21 Q. Are there other properties of the seal material that
22 would be affected by cold temperatures?

23 A. I'm sure there are.

24 Q. Are there any that you can name sitting here today?

25 A. No, I mean, your glass transition temperatures is what

1 we're talking about and what other may be affected
2 below that point is really meaningless because glass
3 once -- glass transition temperature is kind of end of
4 life for the material. If it's moved. Again, if it's
5 moved in that circumstance. If it's not moved, not
6 necessarily.

7 Q. What about compression set? Would a compression set
8 differ over a certain temperature range?

9 MS. FLANNERY: Object to form.

10 A. Are you asking if compression set is dependent on
11 temperature? Yes, it is.

12 BY MR. SZYPA:

13 Q. Would a POSITA implement a safety margin on
14 temperature exposure for these seals?

15 MS. FLANNERY: Object to form.

16 A. On straight temperature exposure? That's not really
17 how that works. It's not a problem if it's exposed to
18 the temperature, it's only a problem if the material
19 itself drops to that temperature; so again, that's the
20 period of time we've talked about. Just like you can
21 take a glass of water, you put it in the freezer at
22 minus 4 degrees C, it's not instantly ice. There has
23 to be a time period for that water to reach zero
24 degrees C.

25 BY MR. SZYPA:

1 Q. So are you saying that a POSITA would not implement a
2 safety margin on temperature exposure for these seals?

3 MS. FLANNERY: Object to form.

4 A. Temperature exposure is not the concern is my point.
5 The temperature of the material is the concern.

6 BY MR. SZYPA:

7 Q. So would a POSITA implement a safety margin with
8 regard to the expected temperature of the material for
9 these seals?

10 MS. FLANNERY: Object to form.

11 A. It could.

12 BY MR. SZYPA:

13 Q. If you were designing one of these systems, would you
14 implement a safety margin for that?

15 MS. FLANNERY: Object to form. Sorry,
16 object to form.

17 A. It would depend on a lot of circumstances.

18 (Mr. Rodgers enters Zoom room.)

19 BY MR. SZYPA:

20 Q. You can't say definitively?

21 A. Not definitively, no.

22 Q. What kind of circumstances would it depend on?

23 A. What you're doing with the material, what you're --
24 where you're moving those temperatures, what pressure
25 is exposed to those temperatures. A lot of things go

1 into it. Glass transition temperatures are pretty
2 well-known temperatures, so maybe you would, maybe you
3 wouldn't.

4 Q. You could say there are certain circumstances then
5 where you would not implement a safety margin for the
6 expected temperature of the material for these seals?

7 MS. FLANNERY: Object to form.

8 A. That mischaracterizes what I said. What I said is it
9 would depend.

10 BY MR. SZYPA:

11 Q. Okay, so when I asked you if a POSITA was designing
12 one of these systems, would they implement a safety
13 margin for the expected temperature of the material
14 for the seals, and you answered it would depend on a
15 lot of circumstances; correct?

16 A. That's correct.

17 Q. So your answer was not yes?

18 A. My answer is not yes. My answer is it would depend.

19 Q. So if your answer was not yes, then you are
20 contemplating certain scenarios where the answer would
21 and could be no; correct?

22 MS. FLANNERY: Object to form.

23 A. Where it could be no? Yes. There are certain
24 scenarios where it could be no. It would be up to
25 that designer and what that designer would want to do.

1 Which it's just like any design consideration, it's a
2 trade-off. It's like any engineering problem is a
3 trade-off.

4 BY MR. SZYPA:

5 Q. You think it would be good practice to not have a
6 safety factor in the design for that parameter?

7 A. It depends. If there were -- may be circumstances
8 where the designer is willing to take that risk and
9 trade-off for some other benefit.

10 Q. Do you recall earlier when we talked about other
11 equipment in the trailer of Van Vliet to radiate heat?

12 A. Yes.

13 Q. Would that equipment have to be on to radiate that
14 heat?

15 A. Generally speaking, there has to be some energy
16 source, yes.

17 Q. I would like to direct you to paragraph 11 of
18 Exhibit 1. And please let me know when you get there.

19 A. Okay, I see it.

20 Q. Do you see the first sentence where you say,
21 "Initially the references that Dr. Rodgers refers to
22 deal with 'long-term storage' and high temperature and
23 severe duty applications of diesel."

24 A. Correct.

25 Q. That's your testimony?

1 A. Yes.

2 Q. Now, only a portion of that -- or I'm sorry, footnote
3 10 provides the source for that?

4 A. Yes, it references those -- I'm sorry, yes, it
5 references those exhibits from the various IPRs.

6 Q. But that sentence isn't an exact quote of -- or from
7 those exhibits; correct?

8 A. No, that -- if it were an exact quote, it would have
9 quotation marks around it. The long-term storage is
10 an exact quote, as I recall.

11 Q. And the rest of it is not?

12 A. Correct, that's why it's not in quotation marks.

13 MR. SZYPA: Liz, you don't have that
14 exhibits -- or either of those exhibits in footnote 10
15 printed out in front of you; do you?

16 MS. FLANNERY: I -- you know what, I don't
17 know. That's a good question. I -- no, I don't
18 appear to have a clean copy of any of that. I mean, I
19 might have my work copies, but I don't think that's
20 what you want to do.

21 MR. SZYPA: So I would like to mark -- I'll
22 take documents 2024 from the 118 IPR, I would like to
23 mark that as Exhibit 4.

24 (Marked for identification
25 Deposition Exhibit 4.)

1 MR. SZYPA: I'm going to drop it in the
2 chat. I'm not optimistic. Yeah, it's not working, so
3 I could put it on the screen and I can email a copy.
4 I guess that's the best we can do.

5 MS. FLANNERY: Yeah, I mean, I'm going to
6 object to lines of questioning that don't allow the
7 witness to explore the full document to the extent he
8 needs to so, I mean, I can make that note and object
9 to form every time, you know, but you can ask your
10 questions, but that's going to be the objection.
11 Sorry, Alex, I'm not trying to make it difficult, I
12 don't have any other solution.

13 MR. SZYPA: Does Dr. Durham have like a
14 mouse in front of him? Is his computer functional if
15 I give him control?

16 MS. FLANNERY: Oh.

17 MR. SZYPA: Can you scroll?

18 MS. FLANNERY: If you can give him control,
19 that might -- that might do it.

20 MR. SZYPA: Okay. That's what I just did.

21 THE WITNESS: Yeah.

22 MS. FLANNERY: I don't know, does it allow
23 you to scroll, Dr. Durham?

24 THE WITNESS: It does.

25 MS. FLANNERY: Okay.

1 THE WITNESS: I don't have eyeglasses for
2 that.

3 MS. FLANNERY: Okay.

4 THE WITNESS: But I can go at it, if we
5 can, see what we can do, okay. I'll see if we can
6 make this work.

7 BY MR. SZYPA:

8 Q. Can you go to 3.1.1, which is on page 9?

9 A. I -- I see -- are you talking about X3.1.1?

10 Q. I'm sorry, X3.1.1.

11 A. Okay, yeah.

12 Q. Can you read that first sentence into the record
13 slowly, please?

14 A. Sure. "This appendix provides guidance for customers
15 (sic) of diesel fuels who may wish to store quantities
16 of fuels for extended periods or use the fuel in
17 severe service or high temperature applications."

18 Q. Now, in paragraph 11 of your declaration, do you
19 see -- I'm sorry, do you see an X 3.1.1 where it says,
20 "Or use the fuel in severe service or high temperature
21 applications."

22 A. Yes.

23 Q. That's not how you stated it in paragraph 11 of your
24 declaration; right?

25 MS. FLANNERY: Object to form.

1 A. When I read it, that was my intent, but no, it has an
2 "and" there. But I did not intend to say long-term
3 storage under high temperature or long-term
4 temperature under severe-duty application. My intent
5 was high temperature and severe-duty modify
6 applications and long-term storage is standalone.
7 Probably needed a comma there or something.

8 BY MR. SZYPA:

9 Q. So it was your intent that it could be any one of
10 those three?

11 A. Yes, correct, long-term storage or extended periods or
12 long-term fuel storage or high temperature
13 applications or severe-duty applications.

14 Q. What is your understanding of severe service?

15 A. I don't have one. It's not defined. Certainly we
16 don't have any evidence to say that fuel to a
17 fracturing pump is. See if it's defined in the
18 document. Hold on.

19 Q. Okay. Take a look at X3.2.5. You can look wherever
20 you want, but I -- X3.2.5, I think it's page 10.

21 A. Okay, here we go. Okay.

22 Q. That provides a definition of --

23 A. Yeah, it does, I agree.

24 Q. And that definition includes the term high-load
25 conditions?

1 A. That's part of what it says.

2 Q. Are there high-load conditions in a frac pump?

3 A. Well, you have to read the entire description.

4 "High-load conditions that can cause the fuel to be
5 exposed to excessive heat," and so I would disagree
6 with that.

7 Q. I'm sorry, so you would disagree with what?

8 A. That fracturing is high-load conditions that can cause
9 the fuel to be exposed to excessive heat. You can't
10 take the high-load standalone. That's not what it
11 says.

12 Q. So in your -- your position, a frac pump does not
13 include an engine operating under high-load conditions
14 that can cause the fuel to be exposed to excessive
15 heat?

16 A. Well, as I said in my declaration, there is no
17 evidence to support that the application of fueling
18 system meets any of these criteria. That's my
19 testimony.

20 Q. So if I understand, you're talking about evidence, but
21 that's not my question. My question is in your
22 position, does a frac pump include an engine operating
23 under high-load conditions that can cause the fuel to
24 be exposed to excessive heat?

25 MS. FLANNERY: Object to form.

1 A. I would say that would depend, and I would say it's
2 also meaningless to the discussion at hand whether
3 that exists or not, because this section is dealing
4 with fuel degradation, and one of the things it talks
5 about is the use of brass materials, and certainly
6 even if that were the case, I'm not admitting that it
7 is, that high heat does not exist at the location of
8 the brass, so it's kind of meaningless whether at the
9 engine it is.

10 BY MR. SZYPA:

11 Q. Okay, but I didn't ask you whether you think the
12 question has meaning or not --

13 A. Well --

14 MS. FLANNERY: Object to form.

15 Q. -- what I asked you was in your position, does a frac
16 pump include an engine operating under high-load
17 conditions that can cause the fuel to be exposed to
18 excessive heat?

19 MS. FLANNERY: Object to form.

20 A. And I answered that question. I said that would
21 depend. I would certainly want to see evidence of
22 that before I agreed to it.

23 BY MR. SZYPA:

24 Q. And what would it depend on?

25 A. It would depend on the operation of the engine, the

1 cooling products, the environment it's in, depend on
2 an awful lot of things. Can't just say offhand, yep,
3 that's it.

4 Q. Is it possible that a frac pump could have an engine
5 operating under high-load conditions that can cause
6 the fuel to be exposed to excessive heat?

7 MS. FLANNERY: Object to form.

8 A. That's the same answer I gave earlier. If you're
9 asking if something is possible, my answer is almost
10 always going to be yes. So I would say, yeah, it's
11 possible.

12 BY MR. SZYPA:

13 Q. What's the red zone? That was something that you
14 mentioned earlier.

15 MS. FLANNERY: Object to form.

16 A. I'm sorry, I didn't hear a question, counsel.

17 BY MR. SZYPA:

18 Q. Oh. You mentioned something called the red zone
19 earlier; do you recall that?

20 A. I do.

21 Q. What is the red zone?

22 A. A red zone's an area around the high pressure pumping
23 equipment and well heads, frac iron, things that
24 contain high pressure where personnel are generally
25 excluded during high pressure pumping operations at a

1 fraction site. Kind of a colloquial term.

2 Q. Are there frac pumps in the red zone?

3 A. Yes, the operating frac pumps would be located inside
4 the red zone.

5 Q. Are there high temperatures in the red zone?

6 A. I --

7 MS. FLANNERY: Object to form.

8 A. High temperatures regard -- with regard to what
9 standard?

10 BY MR. SZYPA:

11 Q. What's -- what is the temperature like in the red
12 zone?

13 A. Well, that depends on how the pads have weighed out.
14 Mostly depends on the ambient temperature.

15 Q. Is it higher than the ambient temperature?

16 A. In some areas, it could be, yes. Some areas, no.

17 Q. How about the areas where the frac pumps are located,
18 could it be -- could the temperature there be higher
19 than the ambient temperature?

20 A. I would say generally close to -- close proximity to
21 the engines, the temperatures can be higher than the
22 ambient temperature.

23 Q. Why is that?

24 A. Because engines release heat. Mostly releases through
25 the cooling system, but some still around on the

1 ground level.

2 Q. I'd like to now direct you to Exhibit 1, section Roman
3 numeral III, which starts with paragraph 5. Please
4 let me know when you get there.

5 A. Yes, I'm there.

6 THE WITNESS: I hate to do this early, but
7 it looks like we're going into a wholly new direction
8 and I need to change -- make flight plans, so if we
9 could take a 10-minute break early, I would appreciate
10 it.

11 MR. SZYPA: Sure, no problem.

12 THE WITNESS: Thanks.

13 MS. FLANNERY: All right, go off the
14 record.

15 (A brief recess was taken;
16 1:05 p.m. to 1:11 p.m.)

17 BY MR. SZYPA:

18 Q. So before our break, I think I directed you to section
19 Roman numeral III of Exhibit 1.

20 A. Yes, sir.

21 Q. And are you there now?

22 A. I am.

23 Q. This section is related to secondary indicia of
24 non-obviousness; correct?

25 A. Yes, sir, that's the title.

1 Q. And did you review Dr. Rodgers's declaration on this
2 topic as well?

3 A. I did.

4 Q. And he had performed an inspection of a fuel
5 automation station unit; correct?

6 MS. FLANNERY: Object to form.

7 A. Generally I remember some reference to that, I don't
8 remember any details of that section.

9 BY MR. SZYPA:

10 Q. Did you also perform an inspection of a fuel
11 automation station?

12 A. Yes.

13 Q. Did you take photographs of a fuel automation station
14 unit during that inspection?

15 A. I did.

16 Q. Did you walk around the inside of a fuel automation
17 station unit during that inspection?

18 A. Yes.

19 Q. Did you see a test operation of the fuel automation
20 station unit during your inspection?

21 MS. FLANNERY: Object to form.

22 A. The way you asked the question, no, it was a different
23 unit.

24 BY MR. SZYPA:

25 Q. You walked around the inside of and took photographs

1 of one fuel automation station unit; is that correct?

2 A. Yes, that's correct.

3 MS. FLANNERY: Object to form and scope.

4 Sorry.

5 A. Yes, sir, that's correct.

6 BY MR. SZYPA:

7 Q. And then you observed a test operation of a second,
8 different fuel automation station unit; is that
9 correct?

10 MS. FLANNERY: Object to form and scope.

11 A. Yes, that's generally correct.

12 BY MR. SZYPA:

13 Q. That was in Victoria, Texas?

14 MS. FLANNERY: Object to form and scope.

15 A. That's my recollection, yes. I don't have the address
16 in front of me, but I recall it's in that area at
17 least.

18 BY MR. SZYPA:

19 Q. And that was before you submitted this supplemental
20 declaration in Exhibit 1; right?

21 MS. FLANNERY: Object to form and scope.

22 A. I don't recall the exact timing. That's certainly a
23 possibility.

24 BY MR. SZYPA:

25 Q. If I said I believe that inspection took place on July

1 25th, does that refresh your recollection?

2 MS. FLANNERY: Object to form and scope.

3 A. I -- not really, but I'm willing to accept your
4 representations if that's the case.

5 BY MR. SZYPA:

6 Q. Do you have any reason to believe that that's not
7 true?

8 A. No, I don't. Neither believe it is or it's not true.
9 A lot of water under the bridge in the last month.

10 Q. Turn to paragraph 30 of Exhibit 1 now, please, and let
11 me know when you're there.

12 A. Okay, I'm there.

13 Q. In I guess the sentence -- there's an image in line
14 with the text of this paragraph. First sentence after
15 that image.

16 A. Okay.

17 Q. Says, "As such, a single operator could easily monitor
18 and take action, as necessary, for as many as 23
19 systems at a time."

20 Do you see that?

21 A. Yes.

22 Q. And that's your testimony?

23 A. Yes.

24 Q. I guess can you explain the significance of that
25 statement to me?

1 A. Sure. Dr. Rodgers's presumption I understand was that
2 you could only have three hoses operating at the same
3 time so that the operator could stay on top of what
4 was going on. His presumption, I guess, was that more
5 than three would be too many for a single operator to
6 handle, and I'm just showing from the references that
7 I don't agree with that opinion, and I believe that
8 it's much more likely and I've seen an operator
9 handle, for example, 23 at a time, and certainly the
10 five or seven that I ran calculations using
11 Dr. Rodgers's model.

12 Q. You're envisioning -- well, first of all, is this
13 screen that you showed here, is it your understanding
14 this is located on the trailer somewhere?

15 A. Yes, that's my understanding. From AFD reference.

16 Q. Your position is that you would have a single operator
17 sitting in front of that screen monitoring it?

18 A. My position is it shows a screen that a single
19 operator could easily monitor and take action.
20 Doesn't mean to say there's only one there or that
21 that operator's always there.

22 Q. The operator could be somewhere else?

23 A. Possible, sure.

24 Q. There could be more than one operator there?

25 A. Possible.

1 Q. If the operator did notice a problem, what would you
2 expect would happen at that point?

3 MS. FLANNERY: Object to form.

4 A. I think the action he would take would depend on the
5 problem he found. Maybe as simple as turning off a
6 single fueling system to a single fracturing pump or
7 it may be as drastic as Van Vliet, just shutting down
8 the entire system with an emergency stop.

9 BY MR. SZYPA:

10 Q. What if fuel was spilling or spewing into the air,
11 what would you imagine the operator would do in that
12 scenario?

13 MS. FLANNERY: Object to form.

14 A. I can't speak for what every operator would do, but he
15 would take some action to stop pressurized fluid flow
16 to the spill -- to the leak location, I would expect.

17 BY MR. SZYPA:

18 Q. Maybe activate a manual shut-off valve somewhere?

19 MS. FLANNERY: Object to form.

20 A. That's one option. Van Vliet certainly teaches that.

21 BY MR. SZYPA:

22 Q. They'd probably do more than just sit there and
23 monitor the screen, though; right?

24 MS. FLANNERY: Object to form.

25 A. Correct.

1 THE WITNESS: Sorry.

2 A. They would monitor and take action as necessary.

3 BY MR. SZYPA:

4 Q. I would like to direct you to paragraph 27 of Exhibit
5 1. Please let me know when you're there.

6 A. Okay, I'm there.

7 Q. See where you say, quote, "A 50 percent duty cycle for
8 the system of Van Vliet (with 10 hoses) would be at
9 least 5 hoses running simultaneously."

10 Do you see that?

11 A. Yes.

12 Q. And that's your testimony?

13 A. Yes, 50 percent of 10 is 5.

14 Q. And now, is that your understanding of the way
15 Dr. Rodgers is using the term duty cycle?

16 A. Well, as I go on to say, that's one interpretation of
17 duty cycle, and then there's another interpretation of
18 duty cycle as well that I address later on and that's
19 the pumps running 50 percent of the time.

20 Q. But here you're not utilizing the, I guess, pump
21 running duty cycle in this paragraph?

22 A. Correct.

23 Q. Why did you choose to use a different definition of
24 duty cycle in this paragraph?

25 MS. FLANNERY: Object to form.

1 A. To cover both definitions of duty cycle.

2 BY MR. SZYPA:

3 Q. Have you ever seen a Frac Shack unit in the field?

4 A. Yes, I have seen Frac Shack units in the field. Seen
5 other brands as well, but I definitely remember seeing
6 Frac Shacks.

7 Q. Were they in operation at the time?

8 A. Yes. Well, presumably so. It was connected to
9 running hydraulic fracturing equipment.

10 Q. Do you recall how many hoses it had?

11 A. No.

12 Q. Do you know whether it had any operational limits?

13 MS. FLANNERY: Object to form.

14 A. Well, I would expect it would have operational limits.

15 BY MR. SZYPA:

16 Q. What operational limits would you expect it to have?

17 MS. FLANNERY: Object to form.

18 A. I wouldn't know. That was not my -- my purpose on
19 being on the frac site where I recall seeing the
20 Frac Shack was certainly not to investigate the
21 Frac Shack.

22 BY MR. SZYPA:

23 Q. You said I don't recall how many hoses it had?

24 A. No.

25 MS. FLANNERY: Object to form.

1 THE WITNESS: Sorry.

2 MS. FLANNERY: You're good.

3 A. No, I don't recall. I don't recall. I was out for an
4 entirely different purpose, noticed they weren't
5 pulling trucks out to refuel them and saw the
6 Frac Shack, said that's cool, and went on about my
7 business.

8 BY MR. SZYPA:

9 Q. Do you understand any relationship between the
10 Frac Shack unit and the Van Vliet reference?

11 MS. FLANNERY: Object to form.

12 A. Could you repeat that, rephrase that?

13 BY MR. SZYPA:

14 Q. Sure. Do you know of any relationship between the
15 Frac Shack commercial unit and the system disclosed in
16 the Van Vliet reference?

17 MS. FLANNERY: Object to form, scope.

18 A. Vaguely I have some recollection that they are
19 related. I don't recall studying that to develop an
20 opinion.

21 BY MR. SZYPA:

22 Q. You have the Van Vliet reference in front of you;
23 right?

24 A. Yes.

25 Q. And the embodiments shown in that reference --

1 utilizes 10 hoses; is that correct?

2 A. Yes, that's correct. That's stated in my declaration,
3 10, yes.

4 Q. In implementing that system, would a POSITA expect
5 that there would be some limit to the number of hoses
6 that were used at once?

7 A. There could be. I think that would depend on, again,
8 the engineering trade-offs that were made and designed
9 in operating the system. There possibly could be.
10 There's certainly nothing in Van Vliet that teaches
11 that.

12 Q. And I guess by used at once, I mean, you know, having
13 fuel pumped through all hoses --

14 A. Sure.

15 Q. -- at once. Was that your understanding of my
16 question?

17 A. Yeah, that was, and I don't see anything in Van Vliet
18 that would limit that, and in my opinion I think a
19 POSITA would understand an optimally designed system
20 was one using 10 hoses and just kept up with
21 consumption, that way you have less wear and tear on
22 equipment. That would be one optimal design that
23 would not have limits, but there may be other
24 trade-offs where the designer or operator would want
25 limits.

1 Q. So when you say using 10 hoses and just kept up with
2 consumption, are you contemplating that that system
3 likely would not have fuel being pumped through all 10
4 hoses at once?

5 MS. FLANNERY: Object to form.

6 A. No, quite the opposite. A system that had 10 hoses
7 running continuous with the pumping continuously and
8 just kept up with fuel consumption would have 10 hoses
9 running simultaneously 100 percent of the time.
10 That's one optimal design.

11 BY MR. SZYPA:

12 Q. Van Vliet discloses, you know, sensors at the end of
13 its hoses that detect a high level and then that hose
14 would be shut off to prevent -- or I'm sorry, that
15 valve would be shut to prevent fluid flow through that
16 hose, you know, to that equipment having the high fuel
17 level; right?

18 MS. FLANNERY: Object to form.

19 A. It does generally have what you described. It's not
20 quite the way he describes it, but yes, generally.

21 BY MR. SZYPA:

22 Q. Okay, what -- let's be clear then. What is different
23 from how I described it?

24 A. Well, generally I would say that's correct. That's
25 not the exact words that Van Vliet uses to describe it

1 but generally that's the concept.

2 Q. So you have a high level sensor at the end of the hose
3 that detects when the fuel level is too high within
4 the equipment that the hose is fueling, sends a signal
5 back to the system instructing, you know, that hose to
6 be shut off; right?

7 MS. FLANNERY: Object to form.

8 A. Generally speaking, yes.

9 BY MR. SZYPA:

10 Q. So it contemplates that that hose then would not be
11 used at that time?

12 A. Correct. If the tank level reaches the high limit,
13 then it would not be used for a period of time.

14 Q. How would running all 10 hoses at once affect system
15 pressure?

16 MS. FLANNERY: Object to form.

17 A. Running all 10 hoses at once affect system pressure?
18 Generally speaking, the pressure required to flow the
19 same amount of fuel would be less than in a system
20 where only part of the hoses are operating.

21 BY MR. SZYPA:

22 Q. I'm sorry, your testimony then is that the pressure
23 required to flow the same amount of fuel through 10
24 hoses at once would be less than if only 3 of the
25 hoses were in operation, for example?

1 A. And flowing the same amount of fuel.

2 Q. And why is that?

3 A. Because the overall system impedance is lower.

4 Q. So you're assuming that the same amount of fuel would
5 be flow -- would be flowing through 3 hoses or 10
6 hoses in that scenario?

7 A. Correct, that's what I said, yes. Well, no, the
8 answer to the question is no, it's not an assumption;
9 that's a determination, yes, not an assumption.

10 Q. Image we looked at earlier from the AFD system, you
11 indicated that it had 23 valve hose fuel tank systems.
12 In your position would it be safe to pump fuel through
13 all 23 of those hoses at the same time?

14 MS. FLANNERY: Object to form.

15 A. Yes, that would be one optimal design. To pump
16 continuously through 23 hoses allows for optimal
17 sizing of the pump, less startup, stop, less wear of
18 the equipment, so that would be the benefit. There's
19 trade-offs like that like there is for any engineering
20 decision, but that would be one optimal design.

21 BY MR. SZYPA:

22 Q. The frac equipment was consuming fuel at different
23 rates?

24 A. I didn't follow that question, I'm sorry.

25 Q. If the frac equipment was consuming fuel at different

1 rates, how could you pump fuel through all hoses 100
2 percent of the time?

3 A. Well, I said that would be one optimal design. I
4 didn't say it was necessarily achievable at any given
5 location, so that's why there's high and low pressure;
6 for example, high and low flow fill levels, but yes,
7 there's no difference in pumping through 23 fuel lines
8 at the same time as there is pumping through 23 15,000
9 psi fracture flow lines at the same time. There's
10 benefits and trade-offs to each.

11 Q. I guess you keep using the term optimal design. What
12 do you mean by that?

13 A. Well, one -- it gives you one -- if you've optimized
14 the system where your pump output matches the fuel
15 consumption, then you don't have to start and stop the
16 pump, you don't have to deadhead the pump, you don't
17 have to open and close valves, are all of which cause
18 wear and give rise to potential malfunction, so that's
19 one optimal design where you've minimized wear on your
20 equipment and you minimized capital costs and
21 operational costs because your pump is sized
22 perfectly. That could be a design goal.

23 Q. In the system of Van Vliet, if the pumps were running
24 continuously and all the valves were closed, what
25 would you expect to happen to the pressure in the

1 system?

2 MS. FLANNERY: Object to form.

3 A. It would reach deadhead pressure and stop.

4 BY MR. SZYPA:

5 Q. And how would it stop?

6 A. Because it's reached deadhead pressure. There's
7 actually several things that could happen in
8 Van Vliet. Van Vliet also has pressure switches that
9 would turn off the pump, but it would also reach a
10 deadhead pressure if those pressure switches did not
11 operate.

12 Q. How would a POSITA prevent that from happening?

13 A. Prevent what from happening?

14 Q. The system reaching deadhead pressure.

15 A. The way Van Vliet teaches is there's a pressure switch
16 that turns off the pump.

17 Q. But I guess can you prevent deadhead pressure from
18 occurring in the first place?

19 A. Yes.

20 MS. FLANNERY: Object to form.

21 A. Yes.

22 BY MR. SZYPA:

23 Q. How?

24 A. By setting the pressure switch of Van Vliet to the
25 point that it does not reach deadhead pressure. You

1 shut off the pump before you reach deadhead pressure.

2 Q. Paragraph 35 of your report, near the end, you state
3 that you "would expect the pump to operate nearly
4 continuously perhaps at varying loads as valves are
5 opened or closed."

6 A. Yes.

7 Q. And that's your testimony; right?

8 A. Yes.

9 Q. If you're varying loads on the pump, would you expect
10 there to be varying pressure in the system?

11 A. Yes, pressure's going to vary.

12 Q. Would varying the pressure in a system produce stress
13 on the valves?

14 MS. FLANNERY: Object to form.

15 A. No, not -- not as long as you're below the rating on
16 the valves. No, varying the pressure doesn't have any
17 impact on the valves below their pressure rating.

18 Q. So the downside pressure limits over which they can be
19 used?

20 A. Yes, of course they do.

21 Q. So then if those valves were to achieve a pressure
22 above their pressure limit, would they fail or
23 malfunction?

24 MS. FLANNERY: Object to form.

25 A. You would expect at some point they would. You would

1 not expect it to be instantaneously necessarily if it
2 was a small deviation above the rating, but you would
3 expect something would occur eventually.

4 BY MR. SZYPA:

5 Q. What would be the outcome of valve malfunctioning or
6 failing?

7 A. Variety of outcomes. It could not close, not open, it
8 could leak through the stem, it could leak through the
9 body, the flap or the gate could malfunction, allow
10 leakage through. There's a lot of things that could
11 happen.

12 Q. Point you now to paragraph 37 of Exhibit 1.

13 A. Okay.

14 Q. Here you point to a couple of Coxreels's models at the
15 450 C and the 500 C. Do you see that?

16 A. Yes, 1125-4-450 C and 500 C, yes, sir.

17 Q. At the top heading there, do you see there's, I guess,
18 a heading above three of the columns called OPT
19 capacity?

20 A. Yes, sir.

21 Q. What's your understanding of what that means?

22 A. My understanding is that's optional capacity. In
23 other words, it's a 1/2 inch reel and then a 1/2 inch
24 hose you could put 450 feet on or if you choose to run
25 a smaller hose, you could run 625 feet of a 3/8 hose

1 on the 450 C model.

2 Q. Then after the 700 feet of hose option, what would the
3 inner diameter be?

4 A. Reel identified there, 3/8 inch.

5 Q. In paragraph 41, I would like to direct your attention
6 there now, please. Let me know when you're there.

7 A. Okay.

8 Q. The second sentence you mention that "fracturing jobs
9 requiring even less fuel were routinely performed
10 before the priority dates --"

11 A. Correct.

12 Q. "-- of the Challenged Patents, and I have witnessed
13 such smaller fracturing jobs in my experience in the
14 field."

15 Is that correct?

16 A. Yes.

17 Q. That's your testimony?

18 A. Yes.

19 Q. Where were those jobs being performed?

20 A. Well, for example, the first half of the sentence, we
21 know that Van Vliet teaches that 9,000 liters would be
22 sufficient for some fracture jobs, so 9,000 liters is
23 somewhere 3,800 -- I'm sorry, 9,000 liters is
24 somewhere around 2,500, maybe 3000 gallons, so that's
25 much less than the 7,500, and I've seen a small

1 fracturing job with just a couple hundred gallons of
2 diesel or less that were used, just the two 50-gallon
3 saddle tanks on two trucks and they were never
4 refueled.

5 Q. Right, my question is where were those jobs?

6 MS. FLANNERY: Object to form.

7 A. The specific one I just referenced -- the specific one
8 referenced are on our wells.

9 BY MR. SZYPA:

10 Q. "On our wells?"

11 A. Yes, on principal of Pedocs, operates more or less 50
12 wells -- stripper wells in Oklahoma. We've talked
13 about that before.

14 Q. What companies perform those jobs?

15 A. I don't recall. I would have to go back and look at
16 the books.

17 Q. What capacity did you witness these jobs?

18 A. Could you repeat the question? I think I missed the
19 front end.

20 Q. Yeah. In what capacity did you witness these
21 fracturing jobs that you mention in the second
22 sentence of paragraph 41 of Exhibit 1?

23 A. As the owner/operator of the wells and the designer of
24 the pumping schedule and the frac design.

25 Q. Was refueling a part of your responsibility in that

1 capacity?

2 A. Well, as I just said, I know it was less than 200
3 gallons because they never refueled the two -- or the
4 four 50-gallon tanks, so no, we didn't refuel.

5 Q. So no refueling was conducted at all?

6 A. Correct. There was no necessity.

7 Q. And how many of these jobs were there?

8 A. Oh, we've done that maybe three times or four in that
9 particular example.

10 Q. Are those three times the fracturing jobs that you're
11 referring to in the second sentence of paragraph 41
12 here?

13 A. That's the ones I've witnessed. The ones that I know
14 that were less than 7,500 gallons. But the first half
15 of that sentence was based largely on the teachings of
16 Van Vliet, where 9,000 liters was plenty, 3,000
17 gallons or less, less than 3,000, less than 2,500.

18 Q. But the ones that you personally witnessed were the
19 three jobs that we just talked about?

20 A. Well, the ones that I know the fuel consumption was
21 less than 200 gallons.

22 Q. Okay, but you talk about jobs that you have witnessed.
23 You say, "I have witnessed such smaller fracturing
24 jobs in my experience in the field."

25 Correct?

1 A. Correct.

2 Q. So which jobs have you witnessed?

3 A. That's what we've just been --

4 MS. FLANNERY: Object to form.

5 A. That's what we've just been discussing.

6 BY MR. SZYPA:

7 Q. Okay, those three that you mentioned earlier; right?

8 A. Those three that I know were less than 200 gallons.

9 Q. Okay.

10 A. There's others that I witnessed that I don't know what
11 the fuel consumption was. My point being 7,500 is not
12 an all-encompassing minimum size for a frac job.

13 Q. And those three jobs that you witnessed, just to be
14 clear, no refueling was conducted at all; correct?

15 A. Correct.

16 Q. How did you know how much fuel was being used?

17 A. I know that it was less than 200 gallons, because
18 there was two 50-gallon saddle tanks on each pump
19 truck, that's 200 gallons total, and they never
20 refueled.

21 Q. Two 50-gallon saddle tanks on two pump trucks?

22 A. On two pump trucks, yes.

23 Q. You say that fracturing jobs required even less fuel
24 were routinely performed. What is your basis for
25 using the term routinely?

1 A. Largely the teachings of Van Vliet that his system is
2 designed for; for example, 9,000 liters, two
3 4,500-liter tanks. If Van Vliet is designing the
4 system as an example for that, then those jobs would
5 have been routinely performed.

6 Q. Does anything else support your use of the word
7 routinely in that sentence?

8 A. I think that's the best support I have right now,
9 considering most of the time I'm on a fracking job,
10 I'm not concerned about the amount of fuel being used.

11 Q. Do you recall describing an optimal design earlier in
12 your testimony?

13 A. I believe I said one optimal design, yes, an optimal
14 design.

15 Q. In that -- in that one optimal design, would safety be
16 a consideration?

17 MS. FLANNERY: Object to form.

18 A. Of course.

19 MR. SZYPA: Mind if we go off the record
20 for 10 minutes?

21 THE WITNESS: That time anyway.

22 MR. SZYPA: Okay, thank you.

23 (A brief recess was taken;

24 1:54 p.m. to 2:04 p.m.)

25 BY MR. SZYPA:

1 Q. I would like to direct you to paragraph 34 of
2 Exhibit 1. Please let me know when you're there.

3 A. Okay, I'm there.

4 Q. You talk about various psi ranges here; right?

5 A. Yeah, there's a couple different -- well, two
6 different ranges.

7 Q. I have a hypothetical for you. If there were a leak
8 in a hose where fuel was spraying from the leak for a
9 given amount of time, would you expect more fuel to
10 leak out at a hose pressure of 60 psi or 80 psi?

11 MS. FLANNERY: Object to form.

12 A. All else being equal, more fuel would leak out of an
13 80 psi than would be a 60; more in 60 than 30; more in
14 30 than 3.

15 BY MR. SZYPA:

16 Q. So all else being equal, the greater the pressure, the
17 more fuel that would leak out?

18 A. Sure.

19 MR. SZYPA: I pass the witness.

20 MS. FLANNERY: Okay. Let's take a short
21 break. Go off the record.

22 (A brief recess was taken;

23 2:05 p.m. to 2:11 p.m.)

24 REDIRECT EXAMINATION

25 BY MS. FLANNERY:

1 Q. Dr. Durham, first, if I may, I would like to direct
2 you to Exhibit 1 to this deposition, which is your
3 supplemental declaration. Just for the record I think
4 in the IPR01237 it's Exhibit 1055, and if you could
5 just go to paragraph 38.

6 A. Okay, I'm there.

7 Q. Okay. And if you could just read that first
8 sentence -- that first sentence aloud.

9 A. "As I testified in my deposition, any of the Coxreels
10 reels would have been acceptable in the system of
11 Van Vliet."

12 Q. And so how does that relate to your obviousness
13 analysis in this case?

14 A. Well, what I'm trying to capture here is that the
15 teachings of Van Vliet, the flat, non-crimping
16 connection, the fluid flow path, those features, those
17 teachings of Van Vliet, which are common to all of the
18 1125 series reels in Van Vliet -- I'm sorry, in
19 Coxreels, would have been -- did I say Van Vliet?
20 Anyway, any -- the teachings of Coxreels that are
21 captured in any of the models of 1125 series are
22 similar and that teaches what I've relied on largely.
23 They could also be dropped in as needs dictate.

24 Q. Okay. I would like to hand you -- I have a clean copy
25 of what is Exhibit 1003 to IPR2023-01236. For the

1 record this is Dr. Durham's original declaration in
2 support of the '118 IPR.

3 MS. FLANNERY: Alex, I can certainly try to
4 email you a copy of this if you would like it, but it
5 is a clean copy of that document as filed. Are you
6 okay with me proceeding with this?

7 MR. SZYPA: Well, we'll mark it as -- are
8 you going to mark it as an exhibit?

9 MS. FLANNERY: I -- I don't need to mark it
10 as an exhibit in the deposition, I mean, it's already
11 an exhibit in the record for the IPRs, but if you had
12 like me to email it and mark it as an exhibit, I can
13 certainly do that. If that would make it easier for
14 you, then that's fine.

15 MR. SZYPA: Let's just mark it as an
16 exhibit. I can pull it up on my own.

17 MS. FLANNERY: Okay. What I will do is I
18 will email it to the court reporter and to you once
19 we're done, and I'm representing that it is the same
20 document that I'm handing him a clean copy of.

21 MR. SZYPA: Okay.

22 MS. FLANNERY: Okay.

23 (Marked for identification
24 Deposition Exhibit 5.)

25 BY MS. FLANNERY:

1 Q. So this will be Exhibit 5 to your deposition,
2 Dr. Durham.

3 Do you recognize that as the declaration --
4 the original declaration that you prepared in support
5 of the IPR petition of the '118 patent?

6 A. Yes, it appears to be.

7 Q. Okay. And if you could, just go to paragraph -- I've
8 opened it to paragraph 149. The heading of this
9 section deals with what?

10 A. This is the rationale and motivation for combining
11 Van Vliet with Coxreels.

12 Q. And at a high level, how does the content of that
13 paragraph relate to your discussion earlier of using
14 the teachings of Coxreels -- of combining the
15 teachings of Coxreels and Van Vliet?

16 MR. SZYPA: Objection, beyond the scope.

17 A. As I say in the middle of the paragraph, "A POSITA,
18 based on the teachings of Van Vliet ... would have
19 been motivated to reference information on
20 commercially available hose reels, such as the ones
21 disclosed in Coxreels when designing the layout of a
22 fuel distribution station ... and when evaluating for
23 size, layout, location, and spacial orientation on
24 location of the mobile distribution site."

25 That's what's in that paragraph. So that's

1 the teachings of -- teachings of commercially
2 available reels in general, it's Coxreels as an
3 example.

4 BY MS. FLANNERY:

5 Q. Are there any other features of Coxreels that you
6 discussed using in the Van Vliet system?

7 A. Yes, the internal fluid paths running through the
8 reel, through the center of the reel to the spindle,
9 the strong A-frame design, the non-crimping flat hose
10 connection. Those kind of things are -- the teachings
11 of Coxreels would have been valuable to a POSITA --

12 Q. Okay.

13 A. -- and trying to implement, if you will, the system of
14 Van Vliet.

15 Q. Now, directing you to the next paragraph, paragraph
16 150 of that document we're looking at, if you could
17 just read the first sentence there. Read it slowly so
18 the court reporter can get it. Sorry.

19 THE COURT REPORTER: I'm sorry, I missed
20 your objection.

21 MR. SZYPA: Objection, outside the scope.

22 THE COURT REPORTER: Thank you.

23 A. "It would have been obvious to a POSITA to use the
24 specific reel described in Coxreels and the system of
25 Van Vliet."

1 BY MS. FLANNERY:

2 Q. Is that your testimony in these proceedings?

3 A. Yes, a POSITA could have taken any of the 1125 series
4 reels and, depending on the particular application,
5 use those with the system of Van Vliet.

6 Q. Do you recall your testimony earlier today when patent
7 owner's counsel was asking you and asked that you're
8 not proposing in this matter that a specific Coxreels
9 reel would be incorporated into Van Vliet's mobile
10 fuel delivery system. Do you recall that testimony?

11 A. Yes.

12 Q. And how does that relate to what you said here in your
13 declaration?

14 A. Well, I -- I understood counsel's question to be
15 asking is there any specific model of the 1125 series
16 that would be uniquely applicable to Van Vliet; in
17 other words, only this one model, are you picking one
18 model out of the 20 or so in Coxreels, and my answer
19 is, no, any of these could have been valuable and
20 could have been dropped in.

21 Q. So your testimony, as stated there in paragraph 150,
22 do you stand by that testimony?

23 A. Yes, of course.

24 Q. In the declaration -- in your declaration submitted in
25 the '805 patent IPR, do you recall giving similar

1 opinions about the -- specifically about the -- about
2 motivating to combine Van Vliet with Coxreels as well
3 as other references?

4 A. Yes, yes.

5 Q. And would your testimony here today apply to those
6 rationales given to the extent that they're similar
7 testimony?

8 MR. SZYPA: Objection.

9 A. Yes, to the extent that I wrote the testimony the
10 same, it would still be applicable, yes.

11 MS. FLANNERY: Dr. Durham, I don't have any
12 further questions for you. I pass the witness.

13 MR. SZYPA: I just want to make sure I got
14 my objection in on that last question.

15 THE COURT REPORTER: No, I did not hear
16 you. So I will put it in.

17 MR. SZYPA: Okay.

18 (Discussion off the record.)

19 MS. FLANNERY: Was there anything else,
20 Alex, or are we done?

21 RE CROSS-EXAMINATION

22 BY MR. SZYPA:

23 Q. Yeah, Dr. Durham, did you speak to counsel at all
24 today about the substance of your testimony?

25 A. Yes, during the last break.

1 Q. During the last break. Did you speak about the
2 Coxreels reference with counsel during the last break?

3 A. Yes.

4 Q. Did you rehearse any questions for Ms. Flannery's
5 redirect here today during the last break?

6 A. No.

7 Q. Did Ms. Flannery ask you any of the questions that she
8 asked during her redirect during the last break?

9 A. We talked about Coxreels and those paragraphs, but I
10 don't recall if the questions were identical or not.

11 Q. Did she ask you similar questions during the last
12 break to the questions that she asked you during
13 redirect?

14 A. We discussed those paragraphs 149, 150, 151, 152, but
15 I don't -- as far as what questions she asked or may
16 have asked, I don't know, I don't recall exactly. We
17 talked about those paragraphs for sure.

18 Q. Did you discuss your answers to those questions during
19 the last break?

20 A. I discussed the substance of my -- what my answers
21 were, yes, the substance of what my answers that I
22 gave Ms. Flannery were part of the discussion of what
23 we talked about at the break, yes.

24 Q. Other than the last break, did you talk to
25 Ms. Flannery about the substance of your testimony

1 during any of the other breaks during today's
2 deposition?

3 A. No.

4 MR. SZYPA: Okay, again, I'll just state my
5 objection on the record, like I did last time. I
6 think that's improper, we will be moving to strike
7 Dr. Durham's testimony on redirect in both this
8 deposition and the one based on his original
9 declaration. And I --

10 MS. FLANNERY: We understand your -- oh,
11 I'm sorry, I didn't mean to interrupt you.

12 MR. SZYPA: And I don't have any further
13 questions.

14 MS. FLANNERY: Okay. We obviously disagree
15 with your view on that, but understand your objection
16 and that it is noted and we have no further questions
17 either.

18 MR. SZYPA: Okay. Thank you for your time,
19 Dr. Durham. I'm sorry --

20 MS. FLANNERY: Let's go -- wait, let's go
21 off the record so she doesn't have to -- off the
22 record.

23 (Discussion off the record.)

24 (Deposition concluded at 2:22 p.m. CST.)

25 * * *

1 State of Michigan)

2 County of Oakland)

3 Certificate of Notary Public

4 I do hereby certify that the witness, whose testimony
5 was taken in the above-entitled matter, was first duly sworn
6 to tell the truth; the testimony contained herein was
7 reduced to writing by means of stenography; afterwards
8 transcribed; and is a true and complete transcript of the
9 testimony given by the witness.

10 I further certify that I am not connected by blood or
11 marriage with any of the parties; their attorneys or agents;
12 and that I am not interested, directly, indirectly or
13 financially, in the matter of controversy.

14 In witness whereof, I have hereunto set my
15 hand this 2nd day of October, 2024.

16
17
18 *Jeanette M. Fallon*
19

20 Jeanette M. Fallon, CRR/RMR/CLR/CSR-3267

21 Certified Realtime Reporter

22 Registered Merit Reporter

23 Certified Shorthand Reporter

24 Notary Public, Oakland, Michigan

25 My Commission Expires: 9-19-30

DEPOSITION ERRATA SHEET

Our Job No. 33550
Case No: Case IPR2023-01236
Patent No: 10,815,118
Case Name: PERMIAN GLOBAL INC., AND MANTICORE FUELS,
LLC v. FUEL AUTOMATION STATION, LLC
Witness: ROBERT ALLAN DURHAM, Ph.D., P.E.

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read
the entire transcript of my Deposition taken in the
captioned matter or the same has been read to me, and the
same is true and accurate, save and except for changes
and/or corrections, if any, as indicated by me on the
DEPOSITION ERRATA SHEET hereof, with the understanding that
I offer these changes as if still under oath.

Signed on the _____ day of _____, 20____.

ROBERT ALLAN DURHAM, Ph.D., P.E.

DEPOSITION ERRATA SHEET

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SIGNATURE: _____ DATE: _____

ROBERT ALLAN DURHAM, Ph.D., P.E.

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|---|--|---|
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