

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIBERTY ENERGY, INC. AND LIBERTY OILFIELD SERVICES LLC,
Petitioner,

v.

U.S. WELL SERVICES, LLC,
Patent Owner

IPR2024-01274
Patent 11,091,992 B2

Record of Oral Hearing
Held: January 22, 2026

BEFORE: ANNETTE R. REIMERS, GEORGE R. HOSKINS, and
SEAN P. O'HANLON, Administrative Patent Judges.

IPR2024-01274
Patent 11,091,992 B2

APPEARANCES:

ON BEHALF OF THE PETITIONER:

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The above-entitled matter came on for hearing on January 22, 2026,
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P R O C E E D I N G S

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JUDGE O'HANLON: Good afternoon, everyone. I am Judge O'Hanlon. I am joined by Judges Reimers and Hoskins. This is a hearing in case number IPR2024-01274, Liberty Energy, Inc. and Liberty Oilfield Services LLC versus U.S. Well Services, LLC. This concerns U.S. Patent Number 11,091,992.

I'd like to start having Counsel for the parties introduce yourselves, beginning with Petitioner, please.

MR. WALTERS: Good afternoon, Your Honor. For Petitioners, this is Chad Walters from Baker Botts.

JUDGE O'HANLON: Welcome, Mr. Walters. And for Patent Owner?

MR. QUARLES: Good afternoon, Your Honor. This is Rick Quarles on behalf of U.S. Well Services, Patent Owner. With me is Scott Border.

MR. BORDER: Good afternoon, Your Honor.

JUDGE O'HANLON: Good afternoon. Welcome, both. As you can see Judge --

JUDGE HOSKINS: Judge O'Hanlon, sorry to interrupt. There's something wrong on the screen in front of my face.

JUDGE O'HANLON: Mr. Favor, can you change the -- there seems to be --

USHER: Yes, I'm working on that right now.

JUDGE O'HANLON: Okay, thank you.

1 JUDGE HOSKINS: Thank you.

2 JUDGE O'HANLON: As you can see, Judges Reimers and
3 Hoskins are joining us by video, and they will only be able to hear what the
4 microphones pick up, so please keep that in mind when making your
5 presentations today. I'd also ask you, when referencing demonstratives,
6 please state the slide number so we may follow along more easily and for
7 clarity of the record.

8 Recording of any PTAB hearing is prohibited. The Court Reporter
9 will provide a transcript of the hearing. That will become a record in this
10 proceeding. Now, our hearing order gave each side 60 minutes of argument
11 time; however, Patent Owner's Counsel, Mr. Quarles, is a LEAP
12 Practitioner, so Patent Owner is granted an additional 15 minutes of
13 argument time. Petitioner will argue first, followed by Patent Owner, and
14 each side may reserve time for rebuttal.

15 Please remember that your arguments should be limited to only
16 those arguments previously made in your briefs. Please make it clear which
17 challenges and claims you're addressing at all times, and we ask that the
18 parties hold any objections until it is your time to speak at the podium.

19 Finally, please note that this is a public hearing and people may be
20 remotely listening or viewing today's proceedings. I don't believe that's an
21 issue in this order. There's no confidential information, as I understand, in
22 this proceeding, so -- but just be aware that it is publicly accessible. Are
23 there any questions before we begin today?

24 MR. WALTERS: None from Petitioners.

25 MR. QUARLES: None from Patent Owner.

26 JUDGE O'HANLON: Thank you. With that, Mr. Walters, you

1 may begin. Would you like to reserve any time for rebuttal?

2 MR. WALTERS: Yes, Your Honor. I'd like to reserve 20 minutes
3 for rebuttal.

4 JUDGE O'HANLON: If you'd just give me just a moment to set
5 the clock here. All right. Mr. Walters, you may begin when you're ready.

6 MR. WALTERS: Thank you, Your Honor. May it please the
7 Board. I'm starting on Slide 8. In this IPR, Patent Owner initially filed a
8 non-contingent motion to amend, giving up on all its original claims in the
9 '992 patent in response to the Board's preliminary guidance, finding that all
10 substitute claims unpatentable, Patent Owner filed a revised motion to
11 amend with the proposed substitute claims at issue here. And Your Honors,
12 I'd like to focus on the issues and the limitations that Patent Owner has
13 actually disputed in the briefing on the revised motion to amend.

14 So, moving to Slide 12, first off, substitute claims 45 to 46 and 54
15 to 59 recite the term "substantially immediately" cut power to the generator.
16 Moving to Slide 14, this is a term of degree with no objective standard for its
17 scope. Namely, how quickly power must be cut for it to be considered
18 substantially immediately. There's also nothing in the specification to help.

19 Moving to Slide 15, this slide shows the Patent Owner's
20 specification cites, which are not helpful in determining the term scope.
21 And I'll note that in Patent Owner's reply on page 3, Patent Owner stated that
22 a POSITA would have understood the claim term based on the specification
23 disclosures, but Patent Owner did not support that position with any
24 testimony from a POSITA.

25 Moving to Slide 16, Patent Owner's expert also could not identify a
26 particular length of time that would qualify, stating that it would depend on

1 the engineering judgement and the configuration of the system itself. And if
2 you -- on this slide, if you look at the second question, he also could not
3 identify as to what "immediately" would mean, let alone the term
4 "substantially immediately."

5 Moving to Slide 17, Patent Owner notes that Dr. Durham provides
6 some examples that would qualify "substantially immediately." Those
7 examples were .016 and .16 seconds, and also, less than a second. But in the
8 same paragraph of Dr. Durham's initial declaration in the proceeding -- this
9 is Exhibit 1003 at paragraph 291 -- he also testified that the specification
10 provides no clarity as to the metes and bounds of "substantially
11 immediately."

12 Moving to Slide 18, the Ironburg case cited by Patent Owner does
13 not apply. It did not involve a term that was subject to engineering judgment
14 as Patent Owner's expert testified with respect to the term "substantially
15 immediately" and it also included specification support to help define the
16 term. We did not have that support here.

17 I'd like to now address the term "hydraulic system." Moving to
18 Slide 20. The term "hydraulic system" appears in substitute claim 44, which
19 depends from Claim 41, and if you read 44 in conjunction with 41, it recites
20 a system for hydraulic fracturing further comprises a hydraulic system.

21 Moving to Slide 21, the specification does not provide written description
22 support for a hydraulic system. Moving to Slide 22, Patent Owner's expert
23 --

24 JUDGE REIMERS: Counsel, I had a question there. Just want to
25 get your thoughts on looking at your Slide 21, paragraph 59 that's quoted
26 there. So, it does say, "In an embodiment, monitoring at the hydraulic motor

1 of the hydration unit can include hydraulic system monitoring, including an
2 operating characteristic, such as system pressure, charge pressure,
3 temperature, hydraulic oil level, and filter status." So, is your position
4 -- because it does say "can include hydraulic system monitoring" and then it
5 lists what these particular operating characteristics could be. Is your
6 position that the mentioning there of it being a hydraulic system -- the
7 hydraulic system is actually in there, and there is monitoring of these
8 particular characteristics, that that is not sufficient to meet the written
9 description for the term "hydraulic system?"

10 MR. WALTERS: Yes, Your Honor. That's our position. The
11 claim specifically recites a hydraulic system and the specification, even here,
12 does not tell us what is the hydraulic system, what's included in the
13 hydraulic system, what are the potential components of the hydraulic
14 system, or even what it is. And so, that's our position that there's no written
15 decision support, Your Honor. And I'll also --

16 JUDGE REIMERS: Thank you.

17 MR. WALTERS: I'll also note that -- well, I'll address this in
18 conjunction with Slide 23. Patent Owner actually cited the specification's
19 incorporation by reference of the '410 patent, which relates to a system for
20 hydraulic fracturing. So, Patent Owner's argument is that hydraulic system
21 is -- has written description support because it could be a hydraulic
22 fracturing system, which, Your Honor, is not in paragraph 59, shown on
23 Slide 21, but we also note that it can't be hydraulic fracturing system because
24 the hydraulic fracturing system is already recited in the preamble to
25 independent claim 41 as we previously addressed.

26 Now, Patent Owner argues that a POSITA would've understood

1 the term, but that's not the requirement. The requirement is whether the
2 specification discloses enough detail, such that a POSITA can clearly
3 conclude the inventor invented the claimed invention. And like I said, Your
4 Honor, the specification here does not tell us what the hydraulic system is or
5 what its components are.

6 JUDGE HOSKINS: So, Mr. Walters?

7 MR. WALTERS: Yes, Your Honor.

8 JUDGE HOSKINS: This is Judge Hoskins. That sounds more like
9 an indefiniteness argument rather than written description argument to me.
10 Doesn't paragraph 46 demonstrate possession of hydraulic system
11 monitoring?

12 MR. WALTERS: You mean paragraph 59?

13 JUDGE HOSKINS: Well, I'm looking -- I'm actually looking at
14 paragraph 46.

15 MR. WALTERS: Okay.

16 JUDGE HOSKINS: It says, "In an embodiment --" I'm on your
17 Slide 21.

18 MR. WALTERS: Sure.

19 JUDGE HOSKINS: Paragraph 46 says, in an embodiment the
20 electrically powered fracking fleet can include a hydraulic system
21 monitoring for the equipment. And then, you know, paragraph 59 kind of
22 flushes out some of the details that are also recited in Claim 44.

23 MR. WALTERS: Yes, Your Honor. Our position here is not that
24 -- necessary that hydraulic system monitoring -- the monitoring of operating
25 characteristics of hydraulic system is disclosed. It's that limitation 44B
26 separately recites that the system further comprises a hydraulic system. So,

1 the system actually has to have a hydraulic system in it.

2 JUDGE HOSKINS: I understand now. Thank you.

3 MR. WALTERS: Moving to Slide 24 and this term is "the
4 compression of liquified natural gas", substitute claim 50 recites controlling
5 compression of the liquified natural gas, and the specification only discloses
6 compressing natural gas in its gaseous state and only references liquified
7 natural gas in reference to vaporization and not compression, and there's no
8 written description support for this term, as well.

9 And Your Honors, I'd like to note another potential 112 issue. I
10 understand the limitations on not raising issues that are not raised in the
11 briefing, but I also understand in conjunction -- in connection with a motion
12 to amend, the Board has the obligation to determine patentability of the
13 claims on their own, and so this issue is not raised in the briefing, but I'd like
14 to raise it, if Your Honors might allow me to. It's another 112 issue.

15 JUDGE O'HANLON: Please proceed. We may or may not
16 consider this in the decision --

17 MR. WALTERS: All right.

18 JUDGE O'HANLON: -- but we'll let you make the argument
19 today.

20 MR. WALTERS: Understood, Your Honor.

21 So, this issue relates to lack of antecedent basis, and I'd like to start
22 at Slide 6. This is Claim 47. So, Claim 47 recites powering the electrically
23 powered pump with a generator and wherein the generator is a turbine
24 generator. That's limitations 47F and 47G.

25 Now, I'd like to turn to subsequent 48 and it's on my Slide 81. So,
26 Claim 48 depends from Claim 47 and it states further comprising powering

1 the electrically powered pump with a generator. So, this is another generator
2 and then the limitation right after says, wherein the generator is fueled by
3 liquified natural gas. So, in Claim 48, "the generator" -- we don't know
4 which generator it's referring to because there were previously two
5 generators introduced in the claim. And then at substitute Claim 50, and this
6 is on our Slide 93, this claim also depends from 48 -- so the claim we just
7 looked at -- it also, again, refers to "the generator" and again, there have
8 previously been recited two generators in Claims -- in connection with
9 Claims 47 and 48. So, it's a potential 112 indefiniteness issue based on lack
10 of antecedent basis for the term "the generator" in Claims 48 and 50.

11 Your Honors, I'd like to continue with the prior art analysis in our
12 opposition to the revised motion to amend. I'd like to turn to Slide 30. One
13 of Patent Owner's arguments is that Coli does not provide motivation to
14 monitor the various operating characteristics that are identified in the
15 substitute claims. As shown on Slide 30, Coli discloses controls and
16 computer monitoring for the entire fracturing operation.

17 Going back to Slide 28, Patent Owner attempts to limit Coli in its
18 arguments. It attempts to limit Coli to some type of single point slave
19 system, but Coli actually uses the term "slave" and the context of syncing
20 components together for centralized control across the entire system. And
21 Patent Owner's argument actually ignores the disclosure we just looked at,
22 which is Coli's disclosure of monitoring the entire fracturing operation. That
23 means all components. And it supports Petitioner's motivations to combine
24 the various operating -- the motivations to monitor the various operating
25 characteristics that are recited in the claims.

26 And notably, Patent Owner does not contest the motivations set

1 forth by Petitioners for monitoring each of the monitoring characteristics in
2 the substitute claims. So, for each of them, Petitioners set forth the specific
3 motivations as to why one of skill in the art would monitor that particular
4 characteristic and those motivations are unchallenged and undisputed in the
5 entire briefing.

6 I'd like to now turn to the various specific limitations that were
7 added, starting at Slide 40, for monitoring valve statuses. You know, Patent
8 Owner's reply only offered a single statement that Armstrong does not
9 expressly disclose monitoring valve statuses. We might've --

10 JUDGE O'HANLON: All right. Judge Reimers, are you -- there's
11 a problem with your display. Can you still hear us?

12 JUDGE REIMERS: Yes, I can. (INDISCERNIBLE -
13 TECHNICAL DIFFICULTIES).

14 JUDGE O'HANLON: Okay. I'm going to pause the timer for just
15 a moment.

16 JUDGE REIMERS: Okay.

17 JUDGE O'HANLON: We're having problems with your audio, as
18 well, Judge Reimers.

19 JUDGE REIMERS: Okay.

20 JUDGE O'HANLON: Thank you. I apologize for the delay.

21 MR. WALTERS: Sure, no problem.

22 JUDGE O'HANLON: Can you hear us, Judge Reimers? It looks
23 like it's back maybe.

24 JUDGE REIMERS: Can you see me now?

25 JUDGE O'HANLON: Yes. Are you able to hear us?

26 JUDGE REIMERS: Yes, um-hum.

1 JUDGE O'HANLON: Okay. I apologize, Mr. Walters. Please
2 continue.

3 MR. WALTERS: Thank you, Your Honor. So, we're discussing
4 the term "valve statuses." Patent Owner only offers a single statement that
5 Armstrong does not expressly disclose monitoring valve statuses. This
6 ignores Armstrong's monitoring and we show this on Slide 40. Valve 11
7 then closes and valve 13 opens to drain liquid. Armstrong monitors its valve
8 11 to determine when it closes so that valve 13 will open. And then in the
9 next paragraph, Armstrong also monitors valve statuses to open solenoid
10 valves 34 and 37 when valves 36, 38, and 41 are closed.

11 Moving to Slide 41, Patent Owner also does not dispute that the
12 combination with Clancy also rendered obvious monitoring valve statuses.
13 Moving to Slide 52, for enclosure exhaust fan run status, Clancy discloses a
14 cooler fan and a control system that control system that controls louvers,
15 which are used to maintain a set temperature. There's undisputed evidence
16 in the record that a POSITA would've been motivated to monitor the fan
17 status, to know the impact on temperature and whether it required service or
18 maintenance.

19 Moving to Slide 53, Patent Owner argues that it's not disclosed by
20 Clancy because it's a cooler fan, but Clancy because it's a cooler fan, but
21 Clancy's cooler fan is an enclosure exhaust fan because it directs air out of
22 the outlet louver. That is what an exhaust fan does, and that's supported by
23 testimony from our expert, Dr. Durham.

24 Moving to Slide 69, in addressing the term "signal is transmitted
25 over armored shielded CAT5E cabling." The Board's preliminary guidance
26 agreed that Thompson discloses the "signal is transmitted over armored

1 shielded CAT5E cabling" and Patent Owner does not dispute Thompspon's
2 disclosure, but argues there is no motivation to combine with Thompson,
3 and Patent Owner does not directly address Petitioner's motivation that a
4 POSITA would've looked at Thompson for details of ethernet cables to
5 protect the cable from damage and prevent interference.

6 Moving to Slide 70, Patent Owner's argument is that a POSITA
7 would not look to Thompson because of Hunt, but under Petitioner's
8 position, it is Coli that provided the motivation to look to Thompson when
9 Coli says that communication is sent over hardwired cable, and ethernet
10 hardwired cables were well known at the time. And I'll also note that the
11 Board has previously determined that it would've been obvious to use
12 ethernet cables in Coli's decision -- and this was in the final written decision
13 in the IPR of the '278 patent, which is the parent to this patent -- and that
14 decision was affirmed by the Federal Circuit, as well.

15 And Patent Owner also seems to argue that because ethernet cables
16 may be unshielded, that means that a POSITA would not look to Thompson,
17 but the availability of unshielded ethernet cabling does not teach away from
18 using armored shielded cabling, particularly for damage protection and to
19 prevent interference, and those were Petitioner's motivations, and those
20 motivations went unchallenged in the record. And there's no expert
21 testimony from Patent Owner to dispute this.

22 I'd like to turn to slide 76 to address monitoring turbine air inlet
23 filter transmitter failure. Petitioners contend that Ekanayake and Bliss
24 disclose this term. Ekanayake discloses wirelessly communicating the
25 degree of fouling in a turbine filter assembly. The preliminary guidance, I'll
26 note, found that this term preliminarily was not disclosed or entered obvious,

1 but it also suggested that the term "fouling" referred to a foul odor. Fouling
2 in this context actually refers to the filter being dirty. That's supported by
3 testimony from Petitioner's expert. Patent Owner's expert also testified that
4 fouling refers to deposits on the filter.

5 Moving to Slide 77, Ekanayake discloses that load cells determine
6 whether a filter is dirty and convert loads into electrical signals. The Bliss
7 reference discloses monitoring the health of load cells, including detecting
8 failure. So, as we set forth in our opposition, it would've been obvious for
9 Coli's system to monitor the status of Ekanayake case filter assembly and
10 wireless communication module using Bliss's technique of determining the
11 health of the load cells and detecting failure to ensure proper operation.

12 Moving to Slide 78, Patent Owner argues that Bliss is non-
13 analogous art, but it is directed to load cell failure prediction and so it's
14 related to monitoring industrial equipment, which is the field of endeavor
15 here. Patent Owner does not offer evidence to contradict Dr. Durham's
16 testimony that a POSITA would look to Bliss for technical details of
17 monitoring load cell failures to ensure proper operation. And Patent
18 Owner's expert also agreed that load cells were known to monitor turbine
19 filters. I'm going to read two questions and answers from the deposition. I
20 noticed that on our slide here, there's a slight misprint on the second
21 question, but these are at Exhibit 1053, page 80, lines 8 to 15.

22 "Q: Were load cells known to monitor filters and industrial
23 equipment in 2015?

24 A: Yes.

25 Q: Were load cells known to monitor filters in turbine generators
26 in 2015?

1 A: Yes."

2 Moving to Slide 79, Patent Owner argues that the claims require
3 using pressure sensors, but they do not. As Dr. Durham testified, which is
4 not rebutted by Patent Owner expert, turbine air inlet filter high also includes
5 filter weight, which is what a load cell measures. He said it means some
6 parameter associated with turbine air inlet filter is high, and he was asked
7 what some of those parameters might be, and he answered, temperature,
8 pressure, fouling level, weight. And this went unrebutted.

9 Moving to Slide 80 to conclude on this term, the prior art's load
10 cells are transmitters because they transmit the measured weight via
11 electrical signals. Patent Owner's expert agree.

12 "Q: The load cells would transmit in the electrical signal that's
13 indicative of the weight?

14 A: Yes."

15 I'd like to turn to Slide 85 and the term "monitoring gas fuel main
16 valve discharge pressure transmitter failure." Moving to Slide 86. Patent
17 Owner argues that Birch merely senses a pressure condition. I'll note that
18 the preliminary guidance found that Birch disclosed this term. And so, Slide
19 86, Patent Owner argues Birch merely senses a pressure condition, but
20 Birch's pressure sensors are transmitters because they would transmit a
21 pressure value. And Dr. Durham provided unrebutted testimony that Birch
22 renders obvious this term because it was well known for pressure sensors to
23 transmit failure codes, and Birch specifically discloses a controller shutting
24 down the system in response to error signals. Again, Patent Owner provided
25 no expert testimony to rebut, even though there was an opportunity for
26 Patent Owner to do so in connection with its reply.

1 I'd like to turn to Slide 100. Kohlenberger discloses monitoring
2 fuel system air supply pressure transmitter failure. Patent Owner's argument
3 appeared to require explicit disclosure of the term, but Patent Owner never
4 disputed that it was known for pressure transmitters, such as those in
5 Kohlenberger to transmit failure codes and that a POSITA would've been
6 motivated to monitor for fuel system air supply pressure transmitter failure.
7 Patent Owner's argument does not rebut the evidence of obvious provided by
8 Petitioners.

9 Similarly, on Slide 101, Birch discloses monitoring thermocouple
10 input module thermistor failure. Birch discloses a thermocouple 18 for
11 monitoring the discharge gas temperature. Petitioners provided expert
12 testimony that it was known for a thermocouple-based temperature
13 transmitter to transmit failure codes and that this limitation is obvious, and
14 again, that testimony went un rebutted.

15 Moving to Slide 105, Birch also discloses monitoring gas fuel
16 control pressure transmitter failure. Birch discloses a pressure sensor 17 to
17 control operation of the compressor, which dictates how much compressed
18 gas is provided to the generator. Now, in Patent Owner's reply on page 11,
19 Patent Owner made a statement about what a POSITA would understand,
20 but there was no support or backup for that statement from testimony from a
21 POSITA. And Patent Owner did not dispute or rebut the evidence that
22 pressure sensor 17 is a gas fueled control pressure transmitter, or that it was
23 well known in the art for pressure sensors to transmit failure codes.

24 Moving to Slide 115 to address the term "torque." The preliminary
25 guidance agreed that Rusnak discloses monitoring the torque. Patent Owner
26 argues that Rusnak does not expressly say it measures the torque value, but

1 actually, in paragraphs 2 and 3 shown on this slide, Rusnak states for some
2 systems that the VFD provides torque measurements and that motor torque
3 values are provided to a processor. And as Dr. Durham testified, there is
4 also monitoring by developing torque curves with torque and speed values.
5 Simply because Resnak does not say -- does not require generating unique
6 performance curves such as TDH or torque does not mean it teaches away
7 from monitoring all together.

8 Moving to Slide 130, Patent Owner makes an argument that one
9 would not have been motivated to combine Delaney with the other
10 references. Patent Owner does not dispute that Delaney discloses
11 monitoring pressure, temperature, hydraulic oil level, and filter status in
12 substitute claim 44, but it argues one would not have been motivated to
13 combine Delaney. Patent Owner does not support that argument with any
14 evidence from a POSITA and as Dr. Durham testified, Delaney monitors
15 several well-known aspects of the hydraulic system, including system
16 pressure, temperature, hydraulic oil level, and filter status. This was at
17 Exhibit 1052, paragraph 594. So, Delaney is in the same field of endeavor,
18 which is controlling and/or monitoring industrial equipment. Dr. Durham
19 also testified that a POSITA would've looked at Delaney for details about
20 monitoring the hydraulic system and recognize that his teachings are
21 applicable to Clancy's hydraulic system.

22 Moving to Slide 136. Patent Owner argues that Coli does not
23 specifically discuss monitoring transformers. Coli does disclose a
24 transformer and as Dr. Durham testified, which went unrebutted, because
25 Coli teaches a control system that monitors an entire fracturing operation, a
26 POSITA would've understood that the transformer, which is part of the

1 fracturing operation, would've been monitored by Coli's control system.
2 Your Honors, I'd like to also now address Petitioner's B Grounds, which rely
3 on -- that the various claim limitations were known and available to the
4 public. Slide 142.

5 JUDGE HOSKINS: Mr. Walters, I'm sorry.

6 MR. WALTERS: Yes, Your Honor.

7 JUDGE HOSKINS: Can you back up to your Slide 136? I
8 apologize for having you go back.

9 MR. WALTERS: Yes, Your Honor.

10 JUDGE HOSKINS: So, do you -- it sounds like you don't have a
11 reference -- any sort of reference that discloses monitoring a transformer
12 specifically. What you have is a disclosure in Coli of monitoring kind of an
13 overall system of which a transformer might be a part of that system. Do I
14 have what is disclosed in the prior art correct as indicated?

15 MR. WALTERS: Coli actually discloses a transformer.

16 JUDGE HOSKINS: Does it disclose monitoring the transformer?

17 MR. WALTERS: No. Well, it discloses --

18 JUDGE HOSKINS: Other than the --

19 MR. WALTERS: It discloses monitoring the entire fracturing
20 operation and because it --

21 JUDGE HOSKINS: Okay.

22 MR. WALTERS: -- discloses a transformer, that's what Dr.
23 Durham used to support his opinion that it rendered the claim obvious.

24 JUDGE HOSKINS: Understood. Thank you so much.

25 MR. WALTERS: Moving to Slide 142 in the B Grounds. So, our
26 opposition also included B Grounds, that each of the new limitations was

1 available to the public under 102(a)1. Patent Owner's arguments in its reply
2 focused solely and exclusively on the disclosure of the limitations in the
3 prior art patents, and did not challenge at all the public availability of the
4 new limitations set forth in the B Grounds or the motivations to implement
5 them. Dr. Durham testified as to each of these new limitations. Patent
6 Owner crossed Dr. Durham, but did not ask at all about public availability.
7 Patent Owner had an opportunity to dispute Dr. Durham's testimony with
8 evidence from its own expert, but chose not to even submit an expert
9 declaration with its reply. And Patent Owner's expert also admitted to the
10 public availability of almost all of the new limitations and all of them that
11 are actually contested by Patent Owner.

12 On Slide 143, 144, and 145, we identified Petitioner's evidence of
13 the public availability of the new limitations, and a POSITA's motivations
14 for implementing them. These slides also show some of the admissions
15 from Patent Owner's expert, and I'll note a couple of them. On Slide 143:

16 "Q: Was it common in 2015 for signals to switch gears to be
17 transmitted over armored shielded CAT5E cabling?

18 A: The technology was definitely available at the time, yes."

19 Slide 144:

20 "Q: Was it common to monitor for failure of a turbine air inlet
21 filter transmitter in 2015?

22 A: For turbines, yes. In general, yes.

23 Q: Was it known to monitor for failure of a turbine generator's gas
24 fuel main valve discharge pressure transmitter?

25 A: The technology for doing that was available at the time. That
26 is correct."

1 JUDGE O'HANLON: Mr. Walters, I have a question about this
2 line of arguments. You cited 102(a)(1). Are you relying on something other
3 than printed publications?

4 MR. WALTERS: Yes, Your Honor.

5 JUDGE O'HANLON: So, and it's -- and public use; is that what
6 you're --

7 MR. WALTERS: Public availability.

8 JUDGE O'HANLON: Is that appropriate for an IPR?

9 MR. WALTERS: It is in connection with a motion to amend,
10 Your Honor. Just like 112 issues are right for addressing by the Board in
11 response to a motion to amend, and there's Federal Circuit case law that
12 supports that. And it's because in connection with a motion to amend, the
13 Board is under the obligation to determine the patentability of the claims,
14 and that's been interpreted to mean not just some printed publications, but
15 it's also in other potential prior art -- system prior art, which is commonly
16 raised in connection with the motion to amend, and also 112 issues.

17 JUDGE O'HANLON: Thank you.

18 MR. WALTERS: With that, if there's no other questions, I'll yield
19 the rest of my -- or I'll reserve the rest of my time, Your Honor.

20 JUDGE O'HANLON: I don't believe there are any more questions.
21 Thank you. We'll now hear from Patent Owner, Mr. Quarles, which -- oh,
22 I'll give you a moment to step up to the podium.

23 MR. QUARLES: Thank you, Your Honor.

24 JUDGE O'HANLON: As you're getting set up, I'll ask you, would
25 you like to reserve any time for rebuttal?

26 MR. QUARLES: Yes, Your Honor. I'll reserve 35 minutes,

1 please.

2 JUDGE O'HANLON: Thirty-five minutes.

3 MR. QUARLES: Your Honor, I also have a hard copy of the
4 presentation for you. May I --

5 JUDGE O'HANLON: Sure. Yeah, you may. We have it on PDF,
6 but I'll take this as well. Thank you. This is just a copy of the slides that
7 were made available to the opposing Counsel?

8 MR. QUARLES: Correct.

9 JUDGE O'HANLON: Thank you. So, you may begin when you're
10 ready, Mr. Quarles.

11 MR. QUARLES: Thank you, Your Honor. May it please the
12 Board. I'm going to jump to Slide 3 and I'll briefly discuss a few high-level
13 subjects before jumping right into the disputed items, but I'd like to first start
14 off with the third bullet that says that our -- the number of substitute claims
15 is reasonable in this case. We have proposed 19 claims in place of the
16 original 20 claims and that substitution represents a less than one-for-one
17 substitution, which is reasonable, and in accordance with statutory
18 requirements that Patent Owner identified in -- specifically, on page 5 of this
19 revised motion to amend. And further, the Board agreed with Patent Owner
20 in its preliminary guidance in the original motion to amend, that the number
21 of substitute claims was reasonable.

22 Still on Slide 3, the substitute claims have written description
23 support and I note that we will get into the disputed aspects of that in just a
24 little while, but specifically, Patent Owner has provided -- has met its burden
25 to show support for all 19 substitute claims, specifically in the '838
26 application and the '363 application. Turning to Slide 4, as Patent Owner

1 identified in the revised motion to amend, paper 21, the proposed claims did
2 not -- also did not broaden the scope of the original claims and specifically,
3 no subject matter is removed from the original claims, and additional
4 limitations have been added. Stated differently and in accordance with case
5 law, specifically Innoscience, because no subject matter is removed by the
6 proposed amendments and the additional limitations have been added. The
7 amendments added by substitute claims 41 through 59 do not seek to enlarge
8 the scope of the claims.

9 On Slide 4 -- we'll cover these topics in greater detail -- but just
10 briefly touching on them, the evidence will show that while Petitioners
11 challenge a subset of the claim limitations regarding indefiniteness, the
12 evidence will show that the proposed claims are not indefinite. And it will
13 further show that the limitations 44B, C, D and 50A do not lack written
14 description support and they're properly supported in the specification. The
15 evidence will further show that the proposed claims respond to the
16 patentability grounds of this trial. And finally, the evidence will show the
17 proposed claims are not obvious in the Petitioner's asserted prior art.

18 Turning to Slide 5, we have the original -- or the proposed
19 substitute claim 41 that adds certain limitations. We will get into -- I will
20 actually skip ahead since -- to the contested -- or specifically, the
21 indefiniteness arguments. Turning specifically to Slide 18, we have the
22 substantially immediately original limitations in Claims 45B and 46B. And
23 here we have certain limitations that recite substantially immediately cutting
24 power to the generator and it's important to realize that these limitations
25 were not new. They were part of the original claims, which is further
26 evidence by the fact that, you know, part of these limitations are underlying,

1 which means they're unmodified from the original claims. For instance,
2 limitation 45B recites wherein the emergency power off unit is configured to
3 substantially immediately cut power from the generator when activated.
4 Proposed Claim 45 is a substitute for original Claim 6, which has included
5 the same limitation. And stated differently, this limitation is unchanged
6 from its original part in original Claim 6. Limitation 46B like --

7 JUDGE HOSKINS: Mr. Quarles?

8 MR. QUARLES: Yes.

9 JUDGE HOSKINS: This is Judge Hoskins. So, I understand that
10 it's part of the original claim. What significance does that have here? Why
11 do you point that out?

12 MR. QUARLES: Your Honor, I point that out because Petitioners
13 have had another opportunity to argue that that claim was indefinite, and
14 specifically, they could have -- and they chose not to do so in their briefing,
15 which we believe shows the inherent weakness in the argument.

16 JUDGE HOSKINS: What opportunity is that?

17 MR. QUARLES: That would be in their opposition to Patent
18 Owner's non-contingent motion to amend, which is paper 16.

19 JUDGE HOSKINS: In this case? Not some other case?

20 MR. QUARLES: Correct.

21 JUDGE HOSKINS: Okay.

22 MR. QUARLES : Correct.

23 JUDGE HOSKINS: Thank you.

24 MR. QUARLES: Turning to Slide 22. Instead of opining that
25 substantially immediately term was indefinite, Petitioner's expert, Dr.
26 Durham, precisely calculated it, which shows that a POSITA reading the

1 '992 patent would understand the term and how to calculate its appropriate
2 upper and lower bounds. As Patent Owner identified in its reply to
3 Petitioner's opposition to the revised motion to amend, which is paper 29,
4 Dr. Durham calculated the substantially immediately trip time in his expert
5 report, and that's Exhibit 1003 on the record in this IPR, paragraphs 290
6 through 291. Specifically, Dr. Durham uses the tripping time curve for
7 switch gear from IEEE Standard 141-1986, Figure 73. And it's reproduced
8 here on this slide.

9 In his calculations, Dr. Durham calculated the substantially
10 immediately trip time to be between 0.06 and 0.16 seconds, which is the
11 lower bound or minimum tripping time as shown by the magenta line, and
12 about 0.16 seconds, which is the upper bound or maximum tripping time, as
13 shown by the redline. Dr. Durham made this calculation using the
14 instantaneous trip portion of the curve, which is the area he annotated in
15 blue.

16 Now, here, the '992 patent claims provided Dr. Durham with the
17 information he needed to consult the applicable tripping time curves for
18 switchgear IEEE Standard 141. From the claim language, we know that it is
19 the emergency power off unit that is configured to substantially immediately
20 cut -- which is another way of saying trip the power. We note -- we also
21 note that the switchgear in question is responsive to a signal from the
22 centralized control unit, to open a breaker, which is another way of saying to
23 trip the breaker. And in fact, it doesn't take an expert in this case, and as any
24 homeowner would know, a circuit gets overloaded -- for example, a breaker
25 trips or opens. So, here, the claim language is telling the POSITA what
26 performance curve to consult, specifically what Dr. Durham calls, in

1 paragraph 290 of his report, tripping time curves for switchgear.

2 We also note from the claim language that the signal to trip the
3 power comes from the centralized control unit, which Dr. Durham admitted
4 that "a POSITA would've understood from the tripping time figure for a
5 commanded trip, such as receiving a trip command from the central control
6 system", which shows that he was well aware of the system and how it
7 operated with the central control system and the fact that he should consult a
8 tripping time curve, and specifically, the instantaneous tripping time curve,
9 based on the fact that it is an emergency power off function. And again, at
10 paragraph 290 of his expert report where he specifically opined on the '992
11 patent event -- well, let me go to -- let me turn to the next slide, actually.

12 Slide 23. Consistent with his opinion that a POSITA would've
13 understood substantially immediately in the context of the '992 patent to be
14 between 0.06 and 0.16 seconds, Dr. Durham also says that such short
15 periods of time, as those identified in Red Book -- in other words, the ones
16 he'd already identified as between 0.06 and 0.16 seconds are faster than an
17 operator could notice a problem and then take action. Now, that's not a
18 calculation of the term. That's a generalization of what he had already -- a
19 generalization description of what he had already determined, specifically
20 was the timeframe in the upper and lower bounds. There's no conflict with
21 Dr. Durham's statement here and his calculation with the precise amount
22 because a POSITA would understand that the time period between 0.06 and
23 0.16 seconds is faster than an operator could notice a problem and take
24 action.

25 Now, turning to Slide 24, Dr. Durham has another admission that
26 is consistent with his analysis in paragraphs 290 and 291 of his expert report

1 where he had already opined that the trip time would be between 0.06 and
2 0.16 seconds. And here, he again makes a generalization that it would be
3 less than one second, which is -- and Petitioners agreed with this analysis
4 and did not raise an issue in their reply to the original motion to amend, that
5 substantially immediately was indefinite.

6 Now, turning to Slide 25, the evidence is showing that a POSITA
7 would understand the substantially immediately term or at least by looking
8 at the claim language, would know where to go, figure out the upper and
9 lower bounds of the term, and hence is not indefinite. Turning to Slide 26,
10 limitations 44B, C, and D further narrow proposed Claim 44 to include a
11 hydraulic system. And the Patent Owner submits that the hydraulic system
12 limitations are supported in the specification. Turning to Slide 27, first, the
13 '992 specification incorporates by reference U.S. Patent Number 9,410,410
14 and it's titled, "System for Pumping Hydraulic Fracturing Fluid Using
15 Electric Pumps." And Petitioners take issue with the term "hydraulic
16 system" not appearing exactly as in the specification, but claim subject
17 matter need not be described in haec verba in the specification in order for
18 the specification to satisfy the description requirements.

19 Turning to Slide 28, Dr. Durham admits the term "hydraulic
20 system" was known to a POSITA at the time of invention. Specifically, in
21 paragraph 600 of Dr. Durham's report, he described hydraulic systems as
22 known techniques and hydraulic fracturing systems as known systems, and
23 Dr. Durham admitted during his deposition that the term "hydraulic system"
24 was known by a POSITA. Thus, doubling down on his opinion that it was a
25 known system in his declaration. Petitioners agree with Dr. Durham that
26 hydraulic systems are known techniques and the hydraulic fracturing

1 systems are known systems, as admitted in their opposition to Patent
2 Owner's revised motion to amend, which is paper 24. A POSITA would
3 thus have understood the term "hydraulic system" as recited in the proposed
4 claim 44 and found sufficient support for it in the specification. Now,
5 turning to Slide 29, proposed claim 50 --

6 JUDGE HOSKINS: Mr. Quarles?

7 MR. QUARLES: Yes.

8 JUDGE HOSKINS: Before you move on to liquifying gas, can we
9 go back to your Slide 27, please?

10 MR. QUARLES: Yes. And I'm sorry, did you say Slide 27?

11 JUDGE HOSKINS: Yeah, 27. Yes, thank you. So, you mention
12 that our challenged patent here incorporates by reference the '410 patent.
13 What's the significance of that with respect to demonstrating possession of a
14 hydraulic system, and what does the '410 patent add that the challenged
15 patent might not have?

16 MR. QUARLES: Well, the '410 patent is using electric pumps and
17 that's really the hydraulic system here. If you look at the claim language
18 specifically, and this goes to your question. When you look at the claim
19 language and it further narrows to say the variable frequency drive is
20 controlling the pumps, then it goes to the question of, okay, our system here
21 is that VFD with the electric pumps, that system within the system that
22 constitutes the hydraulic system, and in this case, the patent is using the
23 electric pumps to define that system.

24 JUDGE HOSKINS: Okay, thank you.

25 MR. QUARLES: Turning to Slide 29. Proposed claim 50 depends
26 from proposed claim 48 and includes the limitation of controlling

1 compression of the liquifying natural gas, also known as limitation 50A.
2 Patent Owner submits that the limitation 50A is supported in the
3 specification and does not lack written description support.

4 Turning to Slide 30. First, the Petitioners admit that controlling
5 liquid natural gas compression is a known technique. And for example, in
6 Petitioner's opposition to Patent Owner's revised motion to amend, which is
7 paper 24, Petitioners not only admit controlling liquid natural gas
8 compression is a known technique, they actually rely on it being a known
9 technique for combining with Allen with the other asserted references. And
10 specifically, on page 16 of their opposition, they assert that controlling liquid
11 natural gas compression is a known technique.

12 Now, second, the '992 patent specification discloses that control of
13 gas compression for deterrence. The specification further discloses that the
14 turbines are powered by liquified natural gas, and a POSITA would
15 understand these two disclosures as teaching control of liquified -- of
16 compression of liquified natural gas.

17 Turning to Slide 31, the evidence will show that the proposed
18 substitute claims are not obvious in view of Petitioner's asserted prior art.
19 Turning to Slide 32, as an initial matter and as Patent Owner identified in its
20 revised motion to amend, which is paper 21, Petitioner's reliance on Coli is
21 flawed. Now, the evidence here will show that Coli does not teach, suggest,
22 motivate, or render obvious comprehensive failure diagnostics. For
23 example, a review of Coli shows that Coli does not specifically disclose
24 monitoring for any failures. In fact, Coli does not disclose monitoring for
25 any failures as particularly important here because it results in missing claim
26 limitations, as we will discuss further. And further, Coli does not provide

1 any direction or blueprint for failure mode -- or failure monitoring in
2 detection, let alone with parameters should be monitored out of the
3 potentially thousands of parameters that could be monitored in a hydraulic
4 fracturing operation. As Dr. Nikilaou explains in his report, Coli does not
5 disclose which parameters POSITA should monitor out of the thousands that
6 could be monitored.

7 Now, turning to Slide 33, instead of teaching a diagnostic and
8 failure detection system, the focus of Coli is a system where "all equipment
9 can be synced or slaved to each other, such that a change at one single point
10 will be carried out by all pieces of equipment." And a POSITA would thus
11 understand that the Coli system is monitoring not for failures, but for real-
12 time operational metrics to support Coli's stated objective while providing
13 equipment synchronization. This is particular important when trying to
14 combine for failure of transmitters, which is not something that Coli
15 discloses. And this is supported by the examples Coli gives of his
16 operations, that they can be controlled and monitored. Namely, power
17 generation and delivery of treatment fluid to its blender module. Again, it
18 doesn't mention that it's monitoring for failures.

19 Dr. Nikilaou explains in his declaration, Exhibit 2107, specifically
20 paragraph 98, a POSITA reading Coli would understand Coli's focus is to
21 teach a coordinated operational system, as opposed to a diagnostic system
22 where all the equipment can be synced or slaved to each other. So, there's a
23 change of one single point to be carried out by all pieces of equipment. Dr.
24 Nikilaou further explained in paragraph 98 of his declaration that his
25 analysis showed Coli, teaches a proactive coordinated system and not a
26 diagnostic and failure system. A review of Coli shows that Coli does not

1 teach the comprehensive failure detection and failure isolation. For
2 example, Coli mentions the term "failure" only twice, either of which is
3 regarding monitoring for failure conditions, and Dr. Nikilaou agrees, as
4 shown in paragraph 99 of his declaration that Coli fails to teach
5 implementation of a comprehensive failure detection and isolation system,
6 and it does not discuss monitoring for failure conditions.

7 Turning to Slide 35, Coli likewise does not teach or suggest
8 monitoring for error codes. As shown at least by the fact that Coli
9 mentioned the term "error" only once and that instance is unrelated to any
10 error codes. For example, the single mention of the term "error" is shown in
11 Coli, paragraph 67, is related to over pressures, which Coli teaches are
12 usually due to human error.

13 Turning to Slide 36, Dr. Nikilaou's analysis, as shown in paragraph
14 101 of his report, shows that while Coli teaches that system could include
15 suitable controls and computer monitoring, Coli does not teach monitoring
16 all equipment on the fracturing side.

17 Turning to Slide 37, Dr. Nikilaou's analysis shows that Coli
18 provides no indication of which operating characteristics are suitable or
19 worth adding in view of factors such as implementation, complexity. In fact,
20 Coli fails to provide any kind of blueprint or direction for which operating
21 characteristics should be monitored.

22 Turning to Slide 38, as the evidence, including Coli itself, and Dr.
23 Nikilaou's analysis shows, it would not have been obvious for a POSITA to
24 monitor the claimed operating characteristics based on the Coli disclosure
25 without the blueprint provided by the '992 patent. Coli fails to disclose or
26 teach which operating characteristics to monitor and Petitioner's proposed

1 modifications are driven by hindsight using the '992 patent as a blueprint.

2 JUDGE O'HANLON: Mr. Quarles, I understand these arguments
3 are in regard to limitation 41N; is that correct?

4 MR. QUARLES: Well, these arguments really are applicable
5 throughout the analysis because Petitioner has repeatedly sought to combine
6 with Coli. Basically, Petitioner has taken the position that if they can
7 identify some sort of a transmitter, then Coli would necessarily teach
8 monitoring for failure of it. Basically, what we'll see, and we'll -- the
9 evidence will show this -- that a reference may teach a certain sensor, but
10 let's say this other reference besides Coli that we're trying to -- that
11 Petitioner is trying to combine -- doesn't teach monitoring for failure of that
12 sensor, and so Petitioners -- and we'll see this -- that Petitioners try to say,
13 well, you just combine it with Coli and now, you supply that missing
14 limitation. And we'll get into the problems with that, but it's certainly -- it's
15 not limited to Claim 44.

16 JUDGE O'HANLON: I had mentioned limitation 41N and I did
17 that because that's the limitation that mentions certain operating
18 characteristics. And I bring that up because your arguments have so far been
19 with respect to Coli, but in Petitioner's opposition, they rely on several other
20 references -- Teets, Clancy, a few others to teach those limitations. So, as I
21 read it, Petitioner is not just relying on Coli, but these other references, as
22 well.

23 MR. QUARLES: Your Honor, they are included in the grounds,
24 but specifically, Petitioner's arguments specifically are more targeted
25 towards the combination with Coli, and I'll get into that a little bit with a few
26 of the claim limitations, but that's the crux of the majority of the arguments.

1 It goes to trying to combine with Coli's system. And really that Coli
2 monitors the entire -- has language that says monitors the entire fracturing
3 operation. And so, that's what Petitioners attempt to cue on, and it's our
4 position that monitoring may include certain parameters for the entire
5 fracturing operation, but not necessarily monitoring for failure, and it's that
6 reliance by Petitioners in their arguments that we're pointing out here.

7 JUDGE O'HANLON: Right. My question was, I believe
8 Petitioner relies on other references other than Coli to teach those
9 monitoring aspects.

10 MR. QUARLES: They are included in the grounds, Your Honor.

11 JUDGE O'HANLON: Right.

12 MR. QUARLES: Turning to --

13 JUDGE HOSKINS: Mr. Quarles?

14 MR. QUARLES: Yes.

15 JUDGE HOSKINS: Can you -- I understand the distinction you've
16 drawn between monitoring a sensor and monitoring for failure of a sensor,
17 for example. What is the claim language in 41 that says what is specifically
18 being monitored is for failure of something, as opposed to just its
19 performance?

20 MR. QUARLES: Yes, Your Honor. Your Honor, I don't see
21 specifically the failure itself part, but I think once we get into some of those
22 dependent claims that we're combining with Coli, that we'll see some of the
23 failures within -- the failure to disclose within those other references.

24 JUDGE REIMERS: Mr. Quarles, just a question, kind of to
25 dovetail off of what I believe both, Judge O'Hanlon and Judge Hoskins were
26 referring to. I'm referring to paragraph 72 of Coli and it states, "Suitable

1 controls and computer monitoring for the entire fracturing operation." So,
2 when we talk about the entire fracturing operation, is your position that that
3 doesn't include, you know, monitoring or controlling anything that's within
4 the fracturing operation? Because it says, "the entire", and I do believe they
5 provide some examples there in paragraph 72 of Coli. So, my question to
6 you is what is your position as far as that language from paragraph 72 of
7 Coli where it says, "the entire fracturing operation?"

8 MR. QUARLES: Your Honor, our position is that even though
9 there's language that says you'll monitor -- you may monitor the entire
10 fracturing operation, it really comes down to two -- really, the argument is
11 twofold. That number one, in the context of -- you mentioned the examples
12 that Coli provides and in fact, not just in the examples it provides at a high
13 level, but there are no specifics and no indication of failure monitoring
14 specifically. It's really -- if you look at the entirety of Coli, you see that
15 what Coli is about, is about monitoring and synchronizing the entire
16 fracturing operation, such that a change in one system will drive changes
17 into the other.

18 So, what we're talking about is -- and read in the context of the
19 entire patent, you see that it's all about monitoring, not for failures, but for
20 changes in systems that -- let's say you change the rate of one system, then
21 you may -- then it would be promulgated to the other systems within Coli's
22 system, and that's really to get to the heart of what Coli's stated purpose is in
23 trying to accomplish with the synchronization, as well as the lack of any
24 specific examples or any discussion whatsoever about it being -- monitoring
25 for failures within that overall system.

26 JUDGE REIMERS: Okay, yeah. I see your point, but would you

1 agree, just referring to 41N as, I believe, Judge Hoskins was, there is no
2 limitation in 41N that refers to failures, correct? It's just monitoring
3 operating characteristics.

4 MR. QUARLES: In the case of 41N, that is correct. As we'll see
5 in other limitations, there are failures, and we'll see that in those. Where our
6 position will be as we get into the details of some of these other limitations,
7 that it's not provided within the exhaust -- I mean, and I can -- for example,
8 and we'll get into this as enclosure exhaust fan run status, for instance. Coli
9 doesn't teach monitoring that enclosure exhaust fan run status. And in fact,
10 none of the asserted art teaches monitoring for an enclosure exhaust fan run
11 status. And so, we'll get into that and I can jump to that, if we want to at this
12 time. And I'm happy to do so, but we will nevertheless get into -- basically,
13 my point is that while this specific limitation may not require monitoring for
14 failures, it's not met in the context of combining with the other asserted art,
15 as well, as we will see.

16 JUDGE REIMERS: Okay. Thank you for that clarification.

17 MR. QUARLES: Absolutely, Your Honor. Turning to Slide 40.
18 Limitation 41N requires monitoring operating characteristics of the claimed
19 gas compressor, including enclosure exhaust fan run status. Turning to slide
20 41, for multiple reasons, Clancy's cooler fan does not disclose or render
21 obvious the claim monitoring of the enclosure exhaust fan run status. First,
22 Clancy notably refers to its fan as a cooling fan to denote its function of
23 providing cooling to the system, as opposed to providing the required
24 function of removing unwanted air that would be associated with your
25 typical exhaust fan. And Clancy makes clear that the purpose of its fan is to
26 provide cooling to maintain a user defined temperature set point.

1 Specifically, in Clancy, paragraph 41, Clancy explains that sensors
2 communicate temperature to its DCS -- its control system -- which uses
3 temperature information to speed up or slow down the cooler fan based on a
4 desired user set point.

5 Now, it's important to realize that there is a separate louver system
6 that Clancy discusses that consists of a recycle and outlet louvers and that
7 determines whether the air is removed from the system. It's not the cooling
8 fan. It's the position of the louvers, if you look at Clancy itself. And while
9 the DCS controls the operation, the cooler fan's job is to cool independently
10 of the louver configuration.

11 Turning to Slide 42, Clancy does not disclose or render obvious
12 monitoring cooling fan run status. Dr. Durham agrees with Patent Owner, as
13 shown by his deposition testimony, that Clancy does not discuss monitoring
14 the cooling fan. Thus, neither Clancy nor Coli, nor any of the asserted
15 referenced disclose, teach, or render obvious monitoring a fan status, let
16 alone an exhaust fan run status, as required by the claim limitation. So, what
17 we're left here, and we're asking -- and what Petitioners are asking is that the
18 Board supply a missing limitation.

19 Turning to Slide 43, limitation 41I requires monitoring operating
20 characteristics of the claimed gas filtration skid, including valve statuses.
21 And turning to Slide 44, Armstrong does not discuss monitoring the valve
22 status, and Dr. Durham admitted as much, as shown by his deposition
23 testimony. Turning to Slide 45, proposed claim 42 is not obvious, at least
24 because it depends from proposed claim 41. Turning to Slide 46, proposed
25 claim 43 depends from proposed claim 41, which is not obvious because
26 Claim 41 is not obvious.

1 Turning to Slide 49, proposed claim 46 requires a switchgear that
2 is responsive to a signal from the centralized control unit wherein the signal
3 is transmitted over our shielded CAT5E cable. Turning to Slide 50,
4 proposed claim 46 requires a switchgear responsive to the signal from the
5 centralized control unit, and for multiple reasons, a POSITA would not have
6 been motivated to look at Thompspon for details of ethernet cables absent the
7 blueprint provided by the '992 patent.

8 Now, as an initial matter, Petitioners rely on Hunt, which discloses
9 several pieces of pieces of -- several communication types of cables. None
10 of which are ethernet cables. Turning to Claim 51 or Slide 51, ethernet
11 cabling, including CAT5E cabling of itself does not solve the problem that
12 Petitioners allege a POSITA would be trying to solve in seeking out
13 Thompson. Petitioner allege that a POSITA would've been motivated to
14 look to Thompspon for details of ethernet cables, and that's a quote. The
15 POSITA would be motivated to look to Thompson for ethernet, and then
16 uses the examples such as shielded CAT5 cabling to protect the cable from
17 damage and prevent interference. And so, it's Patent Owner's position that a
18 motivation -- POSITA would not look for implementations of ethernet
19 cables, specifically only to protect the cables from damage and prevent
20 interference because ethernet cables of themselves do not solve that problem
21 that Petitioners are stating the POSITA would be trying to solve. Turning to
22 Slide 52 --

23 JUDGE HOSKINS: Mr. Quarles?

24 MR. QUARLES: Yes.

25 JUDGE HOSKINS: So, do CAT5E ethernet cables do that?

26 MR. QUARLES: No, Your Honor. As we're on slide -- and I

1 think as we'll see on Slide 52 here, there's an exhibit -- Exhibit 2110 -- that
2 answers that question, the complete guide to CAT5 and CAT5E cabling, and
3 explains that cabling may be shielded or unshielded the U/UTP
4 (Unshielded/Unshielded Twisted Pair), where neither the individual twisted
5 pairs, nor the cable has any additional shielding built in.

6 JUDGE O'HANLON: Mr. Quarles, just to interrupt for a moment,
7 you're almost up with your time you wanted to reserve -- 35 minutes. You
8 can keep going and eat into your rebuttal time.

9 MR. QUARLES: Okay.

10 JUDGE O'HANLON: Just to give you a notice that you're at that
11 --

12 MR. QUARLES: Thank you, Your Honor.

13 JUDGE O'HANLON: -- 35-minute mark.

14 MR. QUARLES: Turning to Slide 54, proposed claims 47 and 56
15 require monitoring operating characteristics of the term "generator",
16 including at least turbine air inlet filter transmitter failure. Turning to Slide
17 55, in its preliminary guidance, the Board agreed --

18 JUDGE HOSKINS: So, here we have -- sorry to interrupt, so
19 -- but here, we have failure, right? I guess to your earlier argument. There
20 does have to be a failure, right?

21 MR. QUARLES: That's correct. That's correct.

22 JUDGE HOSKINS: Okay, thank you.

23 MR. QUARLES: Yes. Yes, Your Honor. In its preliminary
24 guidance, the Board agreed with Patent Owner that the combination of Coli
25 and Birch, Rusnak, Hunt, Broussard, and among other referencing, including
26 Ekanayake, and that's the only combination Petitioners proffered in their

1 opposition regarding the turbine air inlet filter transmitter limitation, that it
2 failed to disclose or render obvious this claim limitation. And specifically,
3 the Board determined a detection of the fouling filters does not mean that
4 there's a detection of a transmitter failure. In detecting the -- that filters
5 -- did not detect any kind of a filter and any kind of a transmission sensor
6 failure.

7 Turning to Slide 56, Petitioners now additionally rely on Bliss for
8 the turbine air inlet transmitter failure limitation. But Petitioner's reliance on
9 Bliss likewise fails for multiple reasons. First, Bliss is non-analogous art.
10 Bliss relates to a weighing apparatus that has designs and methods for load
11 cell failure prediction, and that's Exhibit 1058, but proposed claims 47 and
12 56 do not recite or require load cells, and the evidence shows that the '992
13 patent invention does not use load cells to detect filter transmitter failures.
14 And it's important to realize that sensing with load cells is not the same as
15 sensing with differential pressures. Now, we know that the claim language
16 -- from the claim language and from Dr. Durham's admissions, that the '992
17 patent is not using load cells to detect failure -- the sensor failures.
18 Differential pressure method, that's how the '992 patent determines the filter
19 -- the issues with the filter, which at best, the asserted art is an inferior check
20 of the total weight of the filter. And for instance, if you're only checking for
21 the weight of the filter using load cells, it would not account for specific
22 -- for instance, the fact that different particulates having different weights
23 may have different fouling or different filter -- different problems within the
24 filter.

25 And this is a key distinction because, for instance, filter clogging
26 with lightweight particulates may have a vastly different effect on actual

1 filter clogging than filter clogging with particulates with a relative -- that are
2 relatively heavy. And stated differently, a filter that is slightly clogged or
3 fouled with heavy weight particulates may be the same weight as a filter that
4 is heavily clogged or fouled with a relatively lightweight particulate. So,
5 we're not talking about the same invention here. We're talking apples and
6 oranges. We're talking about the '992 patent testing for differential pressures
7 within the system to determine filter issues, and we're not -- verses a
8 different invention. And so, what we're left with is the missing limitation.

9 Now, turning to Slide 58, proposed claims 47 and 56 are directed
10 to monitoring the failure using pressure sensors that are unrelated to load
11 cells as illustrated by the ability to monitor for differential pressure values.
12 For example, the '992 specification discloses turbine air inlet differential
13 pressure high, turbine air inlet differential pressure, and turbine air inlet filter
14 high. Now, the '992 patent thus uses pressure sensors to monitor for the
15 turbine air inlet filter. Turning to Slide 59 --

16 JUDGE O'HANLON: Mr. Quarles, before you do that, that
17 language is not actually in Claim 47, though, right? Doesn't it just say
18 monitoring for inlet filter transmitter failure?

19 MR. QUARLES: That is correct, Your Honor, but when read in
20 light of the specification, we see that the invention discloses that it's
21 monitoring those differential pressures, such that that claimed language is
22 talking about the sensors -- specifically pressure sensors in this case and not
23 load cells.

24 JUDGE O'HANLON: Is it your position that the specification here
25 defines inlet filter transmitter -- I'm sorry -- inlet filter transmitter failure in
26 that manner? There's a specific electrographical disclosure?

1 MR. QUARLES: Well, within the specification and with the
2 language of the specification as a whole -- in other words, if a POSITA
3 reading the entirety of the specification sees that the specification discloses
4 that the turbine air inlet filter differential pressure high and the different
5 things that the filter has monitored that the transmitters are actually
6 signaling, and when read in light of the specification, then it would -- it
7 enlightens the POSITA that that is the design, and that ultimately is the
8 design disclosed within the specification supported by the claims.

9 JUDGE O'HANLON: Okay, I think I understand your position.
10 Thank you.

11 MR. QUARLES: And turning to Slide 59, Dr. Durham admits that
12 a POSITA would understand turbine air inlet filter DP to mean differential
13 pressure. And when asked during his deposition, Dr. Durham admitted that
14 a POSITA would understand a turbine air inlet filter DP to mean turbine air
15 inlet filter differential pressure. At least because -- and I quote -- "those
16 would be normal things to monitor on a gas turbine. And Dr. Durham's
17 admission shows that the '902 patent inventions, turbine air inlet filter
18 transmitters, are monitoring and transmitting pressure information and have
19 nothing to do with load cells. So, what we have here is an attempt to
20 shoehorn in an unrelated non-analogous reference that teaches load cell
21 failures instead of the invention at hand.

22 Turning to Slide 60, furthermore, Bliss does not disclose or render
23 obvious the detection of a transmitter filter, let alone a turbine air inlet filter
24 transmitter failure. Bliss does not disclose or render obvious detection of a
25 transmitter failure, and Bliss, in fact, specifies that its purpose is to provide a
26 better and more efficient method to predict potential load cell failures and

1 meet ISO 9000 requirements for weighing apparatus.

2 Turning to Slide 61, Bliss explains its weighing apparatus makes
3 periodic tests to determine the health of the load cells in the system. In
4 interest of retaining my rebuttal time, I will -- I'll briefly wrap up. I would
5 just like to formally object to the antecedent basis argument that Petitioners
6 admit was not on the record. And with that, I will reserve the rest of my
7 time. Thank you, Your Honors.

8 JUDGE O'HANLON: Thank you, Mr. Quarles. We'll now hear
9 from Petitioner on rebuttal. I'll give you a moment to get up to the podium,
10 Mr. Walters. You have just over 29 minutes left.

11 MR. WALTERS: Thank you, Your Honor. Just one note on the
12 antecedent basis argument, the Board, in the regulations on the revised -- or
13 the motions to amend. The first was the pilot program. Now it's been
14 formalized. The Board does have the ability to raise grounds on its own that
15 were not argued in the briefing. I'll just note that.

16 JUDGE HOSKINS: Mr. Walters, isn't it also true that there's
17 Federal Circuit case law that says we should not consider new arguments at
18 oral -- that we have not heard before that are presented only at the oral
19 argument stage?

20 MR. WALTERS: As I understand, that pertains to normal IPR
21 briefing and not in the motion to amend context.

22 JUDGE HOSKINS: Why is there a difference? Because this -- we
23 can raise our own grounds in the motion to amend context, I guess?

24 MR. WALTERS: Yes, Your Honor.

25 JUDGE HOSKINS: Okay, thank you.

26 MR. WALTERS: In other words, if I hadn't even brought up the

1 argument, I think Your Honors could raise the argument on its own, raise the
2 issue on its own.

3 JUDGE HOSKINS: Thank you.

4 MR. WALTERS: One note, Your Honor, on the monitoring for
5 failure issue, Patent Owner's briefing completely ignores the evidence of
6 obviousness provided by Petitioners in its opposition to the revised motion
7 to amend as to monitoring for failure. Many of the references specifically
8 disclose failure codes, and Dr. Durham has un rebutted testimony that in light
9 of the reference's disclosure, it would've been obvious to monitor for failure
10 codes. And for many of these limitations, Patent Owner's expert admitted
11 that monitoring for the particular failure of the limitation issue was known
12 and available at the time.

13 I'd like to address three more issues. One, with respect to Coli.
14 Patent Owner argues that Coli does not say which parameters should be
15 monitored out of potentially thousands that could be monitored. Notably,
16 neither does the '992 patent. It lists hundreds of characteristics that could be
17 monitored or controlled. It does not identify which of them should be
18 monitoring or controlled. It does not even describe that monitoring or
19 controlling any particular of these claimed characteristics was novel at the
20 time. It is directed to a system for centralized monitoring and control of a
21 fracturing fleet and that's what Coli describes -- controls and computer
22 monitoring for the entire fracturing operation.

23 I'd like to address the field of endeavor issue, and specifically, with
24 respect to Slide 5, which shows substitute claim 41. So, substitute claim 41,
25 which is an independent claim -- I'll first preface this. Patent Owner's
26 position is that the field of endeavor is limited to fracturing and oil and gas

1 systems. Claim 41 recites a system for hydraulic fracturing and then it lists a
2 number of general industrial equipment that could be used in everything.

3 So, we have an electric pump, we have a centralized control unit to
4 control upon, we have a VFD, we have a generator, a natural gas generator.
5 We have -- maybe that's all that's listed in that claim, but that is general
6 industrial equipment. There's nothing special about this equipment, in
7 particular, to the fracking context. It's just general industrial equipment. If
8 the field of endeavor were limited to -- narrowly limited to oil fracking
9 systems, that would mean that a POSITA could not look to general pump,
10 generator, hydraulic system, gas compressor, technology to combine with
11 Coli's centralized control fracking system.

12 So, the field of endeavor is the field of art that a POSITA would
13 look to -- in connection with -- in connection with the patent and these
14 claims, while they recite hydraulic fracturing in the preamble, it then lists a
15 number of just general equipment that's not specific to fracturing. And it's
16 our position that the field endeavor -- as I said earlier, the '992 patent is
17 directed to centralized monitoring and control and so, the field of endeavor
18 should be monitoring a controlling of industrial equipment. The Bliss
19 reference, for example, describes load cells. Load cells are commonly used,
20 as Dr. Nikilaou testified -- Patent Owner's expert testified, load cells are
21 commonly used to monitor industrial equipment.

22 Similarly, on field of endeavor, we also have the term "ethernet
23 claiming in the claim. If the field of endeavor were limited to hydraulic
24 fracking, then what would mean a POSITA could not look to any other
25 reference outside of hydraulic fracking to determine disclosure, to find
26 disclosure of ethernet cabling, even though ethernet cabling is simply used,

1 at least in some of the claims, to connect to the centralized controller.

2 And Your Honors, I'd last like to turn to the B Grounds. Again,
3 Dr. Nikilaou -- we have testimony from Dr. Durham that each of the
4 limitations was known and available outside of the disclosure of the prior art
5 references. Dr. Nikilaou has admitted to the availability to all of them,
6 including all of them, that were challenged. Enclosure exhaust fan run status
7 -- this is in Dr. Nikilaou's deposition transcript, Exhibit 1053, lines 682 to 7
8 (PHONETIC).

9 "Q: Was it common to monitor the status of an enclosure exhaust
10 fan of a gas compressor in 2015?

11 A: If a gas compressor were used, yes. One would monitor that.
12 Turbine air inlet filter transmitter failure.

13 Q: As of the time of the '992 patent application in 2015, was it
14 known to monitor for failure of a turbine generator's air inlet filter
15 transmission?

16 A: The technology of doing this, yes, it was available."

17 That's at Exhibit 1023, page 39, lines 13 to 17. Fuel system air
18 supply pressure transmitter failure.

19 "Q: At the time of the '992 patent application 2015, was it known
20 to monitor failure of a turbine generator's fuel system air supply pressure
21 transmitter?

22 A: Are you asking about whether that technology was known at
23 the time?

24 Q: Yes.

25 A: Yes, it was."

26 That's 1023, page 35, lines 4 to 21. Thermocouple input module

1 thermistor failure.

2 "Q: At the time of the '992 patent application in 2015, was it
3 known to monitor failure of a turbine generator's thermocouple input module
4 thermistor failure?

5 A: Again, I understand your question to be was that technology
6 available known at the time. The technology was in general known at the
7 time, yes."

8 And that's Exhibit 1023, page 35, line 22 to page 37, line 3. These
9 are all cited in our briefing, Your Honors. So, even assuming if all of Patent
10 Owner's arguments about the disclosure of the new limitations and the prior
11 references are correct, each of the substitute claims is still unpatentable
12 under 102(a)1, given the uncontested and acknowledged availability of each
13 limitation and the uncontested testimony that it would've been obvious to
14 monitor and control each of those claim characteristics in the combined
15 system. With that, Your Honors, we'll -- unless you have further questions, I
16 will yield the rest of my time.

17 JUDGE HOSKINS: I do have one more question.

18 MR. WALTERS: Sure.

19 JUDGE HOSKINS: So, I heard -- I'm going back to the analogous
20 art issue that you were talking about before and field of endeavor.

21 Analogous art is a two-pronged inquiry. There's fields of endeavor is the
22 first and then the second is reasonably pertinent to a problem being
23 addressed. I don't see -- and from a quick review of your sur-reply, I don't
24 see any reliance on the second prong. I can see that it appears to be only the
25 field of endeavor prong; do I have that correct?

26 MR. WALTERS: Your Honor, I think that's correct and I -- it's

1 their opposition to revise motion to amend. I believe -- I know that
2 generally for everything, we relied on field of endeavor. I can't say for sure
3 whether there's not a reasonably pertinent argument in there, but I don't
4 recall one.

5 JUDGE HOSKINS: Okay, thank you.

6 MR. WALTERS: And Your Honors, I have one more question to
7 raise after the hearing that's related to another IPR. I don't think it needs to
8 be on the record for this hearing, but I just wanted to let you know now.

9 JUDGE O'HANLON: Okay. Thank you, Mr. Walters. We'll now
10 hear from Patent Owner on sur-rebuttal. Mr. Quarles, you have just over 26
11 minutes left.

12 MR. QUARLES: Thank you, Your Honor.

13 JUDGE O'HANLON: You may begin whenever you're ready.

14 MR. QUARLES: If Your Honors turn to Slide 65, proposed claim
15 52 requires monitoring for a gas fuel main valve discharge pressure
16 transmitter failure, and Petitioner's reliance on Birch here fails for multiple
17 reasons. Turning to Slide 66, a POSITA would've understood Birch's under
18 pressure and over pressure sensors as sensing an over or under pressure
19 condition, and not detecting the failure of a transmitter that transmits the
20 actual pressure value as the limitation requires. And even the combination
21 with the asserted prior art, what you are left with is a missing limitation.
22 Basically, a hole.

23 And I would encourage a review of a Federal Circuit case, Arendi
24 SARL v. Apple, Inc., which is 832 F.3d et. 1355 from 2016, which actually
25 counsels against the use of supplying a missing limitation without
26 substantial reason and analysis to accompany that. In fact, Birch -- I'm on

1 Slide 67 -- Birch does not discuss monitoring under pressure or over
2 pressure sensor failures and in fact, none of the asserted references disclose
3 in this missing limitation of the gas fuel main valve discharge pressure
4 transmitter failure.

5 Turning to Slide 68, proposed claim 50 requires monitoring
6 operating characteristics of the hydraulic system, including the hydraulic oil
7 level, and Petitioners here relied on Delaney, which is non-analogous art.
8 Specifically, and turning to Slide 69, Delaney is directed to a hydraulic
9 vehicle power takeoff system, and it explains that power takeoff systems are
10 --

11 JUDGE HOSKINS: Counsel, let me interrupt. Is Judge Reimers
12 still there? Okay. I apologize.

13 JUDGE REIMERS: Yes, apologies.

14 JUDGE HOSKINS: She disappeared.

15 JUDGE REIMERS: Yes, it went out just for a moment.

16 JUDGE HOSKINS: Okay, thank you.

17 MR. QUARLES: Delaney explains that power takeoff systems are
18 auxiliary systems, such as hoists, lifts, pumps. They're directly -- ran
19 directly, powered by a vehicle's engine. So, it's not related to oil fracking
20 systems or subsystems, such as those of the '992 patent, and a POSITA
21 would not be motivated to consult Delaney.

22 Proposed claim 51 -- and I'm on Slide 70 here -- proposed claim 51
23 requires monitoring operating characteristics of the turbine generator,
24 including the gas fuel control pressure transmitter failure. Turning to Slide
25 71, Petitioners rely on Birch for this limitation, but Birch fails to disclose or
26 render obvious monitoring for gas fuel pressure, control pressure, transmitter

1 failure, and Petitioners rely on -- specifically on Birch's pressure sensor 17,
2 but again, it's a pressure sensor, and this is one of the classic examples where
3 they're relying on Birch to supply a pressure sensor and then relying on a
4 system such as Coli to monitor a failure. We're in opposition as to Coli does
5 not provide that missing limitation and neither does Birch. A POSITA
6 would've understood Birch's pressure sensor is sensing a pressure condition
7 and not for monitoring a transmitter failure condition as the limitation
8 requires.

9 The claim -- proposed claim 53 -- I'm on Slide 72 here -- requires
10 monitoring operating characteristics of the variable frequency drive,
11 including monitoring for the torque. Turning to Slide 73, Petitioners rely on
12 Rusnak for this limitation, but Rusnak fails to disclose or render obvious
13 monitoring the torque. Instead, what Rusnak teaches is internally
14 monitoring automatically output current in voltage of the VFD to the AC
15 motor without the need for an external torque sensor. And in fact, Rusnak
16 talks about the fact that this is a simpler design by being able to do so
17 without actually monitoring for the torque.

18 Dr. Durham -- I'm on Slide 74 here -- during his deposition, Dr.
19 Durham agreed with Patent Owner that Rusnak's method does not require
20 measuring the torque value, but instead uses a completely different method
21 where it uses what Dr. Durham referred to as standard performance curves
22 and the affinity relationships based on speed. So, as Dr. Durham agrees,
23 Rusnak does not teach monitoring the torque, but instead, calculating the
24 torque using performance curves.

25 Turning to Slide 75, proposed claim 55 requires signaling a switch
26 gear from the centralized control unit wherein a signaling is transmitted over

1 armor shielded CAT5 cabling. And again, in turning to Slide 76, Petitioners
2 rely on Thompson, which as we've already discussed, does not render
3 obvious signaling the switch gear for the same reasons we discussed
4 regarding proposed claim 46. Proposed claim 44 requires monitoring
5 operating characteristics of the hydraulic system, including hydraulic oil
6 level. And Delaney here fails to disclose or render obvious monitoring
7 hydraulic oil level for the same reasons we discussed before. It's our
8 position that it's non-analogous art.

9 Proposed claim 58 requires monitoring the control of transformers.
10 I'm on Slide 79 here. On Slide 81, Coli does disclose or render obvious
11 specifically monitoring the transformers. And it is our position that it would
12 not have been obvious to monitor the transformers based on Coli or any of
13 the other asserted references.

14 I'd like to just briefly address the Petitioner's position that the '992
15 patent doesn't suggest which operating parameters to monitor, but as the
16 POSITA reading the specification would understand that what's being
17 delineated there are the parameters and the operating characteristics, that are
18 worth monitoring, and that's really more of the values in the patent itself is
19 to know which parameters are worth monitoring or out of the potentially
20 thousands of characteristics that could be monitored. And with that, I'll
21 leave the rest of our issues on our briefing, unless the Board has any further
22 questions for me at this time.

23 JUDGE O'HANLON: I don't believe we do, so thank you, Mr.
24 Quarles.

25 MR. QUARLES: Thanks.

26 JUDGE O'HANLON: And thank you, both, for your presentations

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1 today. We will take everything under advisement when preparing the final
2 written decision and the case has been submitted. Let's go off the record
3 now.

4 (Whereupon the above-entitled matter went off the record at 2:39
5 p.m.)

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