

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIBERTY ENERGY, INC. and LIBERTY OILFIELD SERVICES LLC,
Petitioners,

v.

U.S. WELL SERVICES, LLC,
Patent Owner.

IPR2024-01274
U.S. Patent No. 11,091,992 B2

**PATENT OWNER'S REPLY TO PETITIONERS' OPPOSITION TO
PATENT OWNER'S REVISED MOTION TO AMEND UNDER
37 C.F.R. § 42.121**

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<i>In re Smith</i> , 481 F.2d 910 (CCPA 1973)	4

PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	Declaration of Richard Quarles in Support of Motion for <i>Pro Hac Vice</i> Admission
2002	U.S. Patent No. 11,136,870 to Broussard
2003	Dr. Robert Durham Deposition Taken November 15, 2023, in IPR2025-00558 addressing U.S. Patent No. 11,136,870
2004	Declaration of Dr. Robert A. Durham, dated February 10, 2023, in IPR2025-00558 addressing U.S. Patent No. 11,136,870
2005	U.S. 14/884,363 CIP Application filed 10-15-2025 to Broussard
2006	Curriculum Vitae of Dr. Michael Nikolaou
2007	Declaration of Dr. Michael Nikolaou
2008	US 8,789,601 to Broussard
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2010	US 10,227,854 to Glass
2011	US 9,284,829 to Craig
2012	US 10,246,984 to Payne
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2014	US 7,841,394 to McNeel
2015	US 8,997,904 to Cryer
2016	US 7,836,949 to Dykstra
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2020	US 5,865,247 to Paterson
2021	US 5,189,388 to Mosley,
2022	US 5,606,853 to Birch
2023	US 2007/0125544 to Robinson
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2040	US 2011/0197988 to Vliet
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2045	US 2011/0194256 to De Rijck
2046	US 7,949,483 to Discenzo
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2051	US Provisional 61/710,393 to Coli
2052	US 9,893,500 to Oehring
2053	CN 102602322 to Li
2054	CN 103089226 to Wang
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2056	CN 207829871 to Zhang
2057	US 2015/0114652 to Lestz
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2061	US 2020/0088202 to Sigmar
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2063	Reserved
2064	CN 105090423 to Yang
2065	CN 105134581 to Yu
2066	CN 203783839 to Yi
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2071	US 4,100,822 to Allan
2072	US 4,309,152 to Hagen
2073	US 7,901,314 to Salvaire
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2075	US 2004/0219040 to Kugelev
2076	US 2010/0093484 to Huang
2077	US 2017/0051732 to Hernandez
2078	US 2023/0265839 to Buckley
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2093	MDT website – Mobile Data Technologies Product Catalog (mobiledatatech.com), compiled webpages from The Wayback Machine
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2097	U.S. Well Services and KCF Technologies Announce Integration for Electric Frac with Fully Automated Pump Control

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2098	Honghua Group Limited, Oil and Gas Technology, August 4, 2021 (www.oilandgastechnology.net/upstream-news/chinese-company-launches-new-fracking-rigs)
2099	Comprehensive Power Inc. website (http://www.comprehensivepower.com:80/about_us.htm), compiled webpages from The Wayback Machine
2100	Evolution Well Services Advances Fracturing Operations with an Electrically Powered System, June 04, 2012
2101	Stewart & Stevenson Services, Inc. website (http://www.stewartandstevenson.com), first set of compiled webpages from The Wayback Machine
2102	Stewart & Stevenson Services, Inc., Intelligent Pump Control Systems (controls.info@ssss.com), second set of compiled webpages from The Wayback Machine
2103	U.S. Patent Application No. 13/679,689
2104	Declaration of Matthew Hopkins
2105	Reserved
2106	Reserved
2107	Declaration of Dr. Michael Nikolaou in Support of Patent Owner's Revised Motion to Amend
2108	Dr. Robert Durham Deposition Taken October 8, 2025
2109	Dr. Robert Durham Deposition Taken December 11, 2025
2110	A Complete Guide to Cat5 & Cat5e Cable
2111	Know your Cat 5-6-7 Unshielded Twisted Pair (UTP) Network Cables

I. INTRODUCTION

Patent Owner (“PO”) submits this Reply to Petitioners’ Opposition to Patent Owner’s Revised Motion to Amend (“Opp.”). Petitioners’ arguments opposing patentability of substitute claims 41–59 (“SCs”) fail for reasons described herein.

II. THE SUBSTITUTE CLAIMS ARE NOT INDEFINITE

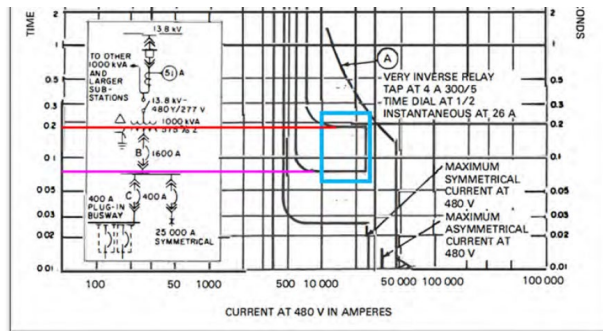
Petitioners belatedly argue that there is “no objective standard for ascertaining the scope of ‘substantially immediately’” to allege that SCs 45–46 and 54–59 are indefinite. Opp., 1. ***Not true***, as illustrated by Petitioners’ and Dr. Durham’s admissions to the contrary.

First, and as an initial matter, Petitioners argue ***for the first time*** that the “substantially immediately” term is indefinite even though the term is in the original claims (“OCs”). Stated differently, every instance of the “substantially immediately” term is exactly as recited in the OCs. Petitioners had at least one previous opportunity¹ to raise this indefiniteness issue but did not do so. That failure demonstrates the objective weakness of this new indefiniteness argument.

Second, Dr. Durham ***calculates (i.e., “ascertain[s] the scope of”)*** the “substantially immediately” trip time for switchgears to be between “~0.06

¹ For example, Petitioners did not raise this argument in their Opposition to Patent Owner’s Non-Contingent Motion to Amend (Paper 16).

seconds” and “~0.16 seconds.” EX-1003, ¶¶ 290–291.² Specifically, Dr. Durham uses the “tripping time” curve for switchgear, IEEE Standard 141-1986 (“Red Book”), Figure 73 (annotated) (reproduced below), to calculate “substantially immediately” trip times “between ~0.06 seconds (minimum tripping time, magenta line) and ~0.16 seconds (maximum tripping time, red line)” using the “instantaneous trip portion of the curve (area annotated in blue).” *Id.*, ¶ 290 (internal quotes omitted); EX-1021, Fig. 73.



Ex. 1021 (Red Book) Fig. 73 (annotated)

Id., ¶ 290 Fig. 73 (upper portion of figure omitted). Dr. Durham admits that “such short periods of time as those identified in Red Book are faster than an operator could notice a problem and then take action,” and that “such short times are at least one example of what would qualify as ‘substantially immediately.’” *Id.*, ¶ 291.

Third, Petitioners and Dr. Durham admit that one example of “substantially immediately” is when “switchgear ... is tripped in *less than one second (i.e.,*

² All emphasis added herein.

“substantially immediately”). Pet., 60; EX-1003, ¶ 293 (“It is my opinion that *a POSITA would have understood* this [Hunt] disclosure to teach that the emergency power off unit (switchgear) is configured to *substantially immediately (less than 1 second)* cut power from the generator when activated.”). The “substantially immediately” term as recited in the SCs is thus readily understandable to a POSITA and not indefinite, as admitted by Petitioners and Dr. Durham and as illustrated by Dr. Durham’s ability to calculate “substantially immediately” as between “~0.06 seconds” and “~0.16 seconds.” EX-1003, ¶¶ 290–291; *see Ironburg Inventions Ltd. v. Valve Corp.*, 64 F.4th 1274, 1287-88 (Fed. Cir. 2023) (finding “substantially the full distance” “not invalid as indefinite”).³

III. THE SUBSTITUTE CLAIMS DO NOT LACK WRITTEN DESCRIPTION SUPPORT

Petitioners argue that SC 44 lacks written description support because the specification does not disclose a “hydraulic system.” Opp., 2. The specification,

³ The specification here confirms that the purpose is to shut down or cut off power in emergencies or dangerous operating conditions. EX-1001, 7:28-44, 10:53-58 (teaching that in an emergency situation, pumps should be stopped “substantially instantaneously,” which is consistent with the claim language), 11:42-51 (same). A POSITA would have understood the claim term based on these disclosures.

however, discloses hydraulic systems. *See* EX-1001, 1:9-18 (incorporating by reference USPN 9,410,410 titled “System for Pumping Hydraulic Fracturing Fluid Using Electric Pumps”),⁴ 1:60-61 (“Disclosed herein is a system for hydraulically fracturing an underground formation....”). Petitioners take issue with the term “hydraulic system” not appearing exactly in the specification, but “claimed subject matter need not be described in haec verba in the specification in order for the specification to satisfy the description requirement.” *In re Smith*, 481 F.2d 910, 914 (CCPA 1973). Moreover, Dr. Durham admits that the term “hydraulic system” was known to a POSITA at the time of invention. EX-2109, 29:19-30:4; *see also* EX-1052 ¶ 600 (admitting “known techniques [e.g.] (hydraulic systems)” and “known systems [e.g.] (hydraulic fracturing systems)”). Petitioners admit likewise. Opp., 21. A POSITA would thus have understood the term “hydraulic system” as recited in SC 44 and found sufficient support in the specification for it.

Petitioners argue that SC 50 lacks written description support because the specification does not disclose “controlling compression of the liquefied natural gas.” *Id.* at 3. But Petitioners’ argument fails because Petitioners admit that

⁴ USPN 9,410,410 is found at EX-1010 and discloses a system for hydraulic fracturing, which is a “hydraulic system.”

“controlling LNG compression” is a “known technique[]” (*id.* at 16), and the 992 Patent discloses “control of the gas compression for the turbines [i.e., generators]” that are “powered by liquefied natural gas.” EX-1001, 5:31-32, 4:34-37.

IV. THE SUBSTITUTE CLAIMS ARE NOT OBVIOUS IN VIEW OF PETITIONERS' ASSERTED PRIOR ART

PO's SCs 41–59 are not obvious per the asserted references (“ARs”). As an initial matter, PO incorporates in its entirety all arguments made, and positions taken, in Patent Owner's Revised Motion to Amend (Paper 21) (“RMTA”) regarding the patentability of the SCs. RMTA, § VI.B. Further, Petitioners' reliance on combining ARs with U.S. Pat. Pub. No. 2012/0255734 (“Coli”) Operational Control Center fails for the same reasons described in RMTA, § VI.B.2.

A. GR. 12A and 12B: SCs 41–42 Not Obvious.

SC 41 and SCs 42–46, by virtue of dependance from SC 41, require monitoring operating characteristics of the claimed gas compressor, including the enclosure exhaust fan run status. Petitioners rely on U.S. Pat. Pub. No. 2007/0269317 (“Clancy”), specifically its cooler fan, to argue that SC 41 is obvious (Opp., 11), but Clancy's “*cooler fan*” does not disclose or render obvious the claimed monitoring of the “enclosure *exhaust fan* run status” for numerous reasons. *First*, Clancy's cooler fan is, as the name confirms, a “cooling fan” and not an “enclosure exhaust fan” as the claim requires. EX-1055, ¶ 39 (“cooler fan

(37)"). Clancy explains that the purpose of its "cooler fan" is to provide *cooling* to maintain a user-defined temperature set point, instead of an exhaust fan to remove undesirable air as the claim requires. *Id.*, ¶ 41 ("A fifth temperature sensor ... *communicates the temperature* to the DCS which can use this information to *speed up or slow down the cooler fan based on the desired set point.*").

Second, even assuming—without conceding—Clancy's cooling fan is an exhaust fan, Clancy does not disclose or render obvious monitoring cooling fan run status. Clancy does not discuss monitoring cooling fan status (*see id.*, ¶ 39), and Dr. Durham admits as much. EX-2109, 46:6-10. Thus Clancy, alone or combined with any other ARs, fails to disclose or render obvious SC 41 or SCs 42–46.

Finally, Armstrong does not expressly discuss *monitoring* "valve statuses."

B. GR. 13A and 13B: SC 43 Not Obvious.

GRs 13A and 13B fail for the same reasons discussed above in § IV.A.

C. GR. 14A and 14B: SCs 45–46 Not Obvious.

First, GRs 14A and 14B fail for the same reasons discussed above in § IV.A.

Second, Petitioners' argument that a POSITA would have been motivated to "look to Thompson [U.S. Pat. Pub. No. 2009/0181582 ("Thompson")] for details of Ethernet cables" (Opp., 14) fails at least because a POSITA would not have been motivated to look for additional communications options—absent the blueprint provided by the '992 Patent—given that Hunt discloses five communications

options, “PSTN, DSL, CATV, BPL, and/or wireless services,” with *no mention of Ethernet communications*. EX-1008, ¶ [0076]. Further, Ethernet cabling, including CAT5E cabling—of itself—does not solve the problem Petitioners allege a POSITA would be trying to solve in seeking out Thompson. Opp., 14 (“A POSITA would have been motivated to look to Thompson for details of Ethernet cables, such as shielded CAT5E cabling, *to protect the cable from damage and prevent interference*.”). Indeed, Ethernet (e.g., CAT5E) cabling may be shielded or unshielded. EX-2110, 7 (explaining Ethernet cable may be unshielded (e.g., “U/UTP (Unshielded/Unshielded Twisted Pair)”) where “[n]either the individual twisted pairs nor the cable has any additional shielding built-in”); EX-2111, 1–2. Petitioners’ alleged motivation for a POSITA to “look to Thompson” thus fails.

D. GR. 15A and 15B: SCs 47–49, 52, 54, 56–57, and 59 Not Obvious.

SCs 47 and 56—and SCs 48–55 and 57–59—based on dependance from SC 47 and SC 56, respectively, require monitoring operating characteristics of the turbine generator including at least turbine air inlet filter transmitter failure. In the Board’s preliminary guidance (Paper 20) (“Guidance”), the Board agreed with PO that the combination of Coli, Birch, Rusnak, Hunt, Broussard079, Broussard601, Kohlenberger, Ekanayake, Weiher, and Newman—the only combination Petitioners proffered in their Opposition regarding the “turbine air inlet filter transmitter failure” limitation, alone or in combination—fails to disclose or render

obvious this claimed limitation. *See* Guidance, 21. Now, Petitioners additionally rely on U.S. Pat. No. 6,576,849 (“Bliss”) in their opposition for the claimed turbine air inlet filter transmitter failure limitation. Opp., 14–15. This combination likewise fails for multiple reasons. **First**, Bliss is non-analogous art. Bliss relates to a “weighing apparatus” that “has designs and methods for load cell failure prediction.” EX-1058, 1:19-21. But SCs 47 and 56 do not recite or require load cells, and a POSITA would thus not be motivated to look to Bliss—nor any other references directed to load cell failure detection. Indeed, SCs 47 and 56 are directed to monitoring turbine air inlet filter transmitter failure using pressure sensors that are *unrelated to load cells*, as illustrated by the ability to monitor differential pressure values. EX-1001, 15:42–53 (“turbine air inlet filter DP [i.e., differential pressure] high”), 19:15-47 (“turbine air inlet filter DP [i.e., differential pressure]”), 14:16-42 (“turbine air inlet filter [pressure] high”). Dr. Durham admits that a POSITA would understand turbine air inlet filter “DP” to mean “differential pressure.” EX-2109, 55:22-56:2 (Q: “A POSITA would understand a turbine air inlet filter DP to mean turbine air inlet differential pressure, right? A: I think so. Those would be normal things to monitor on turbine, on a gas turbine like this.”).

Second, Bliss does not disclose or render obvious detection of a transmitter failure, let alone a turbine air inlet filter transmitter failure. Instead, Bliss is directed to detecting and *predicting load cell failures*, not detection of transmitters

relaying the information load cells provide. EX-1058, 2:31-34 (“An object of the present invention is to provide a better and more efficient *method to predict potential load cell failures* and meet ISO 9000 requirements for weighing apparatus.”). Bliss explains that its “weighing apparatus makes periodic tests to determine the *health of the load cells* in the system.” *Id.*, 2:41-46. Petitioners’ mistake load cell failure detection and prediction (i.e., measuring component failures) for transmitter failures (i.e., failure of equipment relaying the measured information). This error is akin to Petitioners’ error—as the Board identified in its Guidance—mistaking Ekanayake’s fouling detection (i.e., measurement of fouling) for the required monitoring for transmitter failures (i.e., monitoring for failure of transmitters or communication devices relaying fouling information). Even combining Bliss and Ekanayake, a POSITA at best may arrive at an invention predicting failures of fouling detection components (e.g., load cells), and not detection of transmitter failures relaying load cell information. Thus, Bliss and Ekanayake, alone or in combination with each other and all other ARs, fail to disclose or render obvious monitoring turbine air inlet filter transmitter failures as the SCs require. SCs 47–59 are thus not rendered obvious for at least this reason.

SC 52 requires monitoring for a “gas fuel main valve discharge pressure transmitter failure.” Petitioners allege that Birch’s (i.e., U.S. Pat. No. 5,606,853 (“Birch”)) under and over pressure electronic sensors 6a and 6b disclose this

characteristic. Opp., 15–16. Not true. **First**, a POSITA would have understood Birch's under-pressure and over-pressure sensors as sensing an under/over pressure condition, not detecting the failure of a transmitter that transmits the actual pressure value as the limitation requires. Stated differently, SC 52 requires monitoring for failure of a transmitter that transmits gas fuel main valve discharge pressure, but Birch's sensors merely detect an under-pressure or over-pressure condition that (1) does not transmit a pressure value and (2) does not expressly discuss transmitting *any value* to another subsystem or control center. **Second**, even assuming—without conceding—a POSITA would understand Birch's under-pressure and over-pressure sensors as gas fuel main valve discharge pressure transmitters, Birch does not discuss monitoring for under-pressure or over-pressure sensor failures. *See* EX-1005. Thus, Birch, alone or in combination with any or all other ARs, fails to disclose or render obvious the claimed monitoring of “gas fuel main valve discharge pressure transmitter failure.”

E. GR. 16A and 16B: SC 50 Not Obvious.

First, GRs 16A and 16B fail for the same reasons discussed above in § IV.D.

Second, Petitioners rely on Delaney for limitations monitoring “hydraulic oil level,” but this argument fails for the same reasons discussed below in Section IV.I.

F. GR. 17A and 17B: SC 51 Not Obvious.

First, GRs 17A and 17B fail for the reasons discussed above in § IV.D.

Second, Petitioners rely on Birch's "pressure sensor 17" for the claimed "gas fuel control pressure transmitter failure." Opp., 18. But a POSITA would have understood Birch's pressure sensor as sensing a pressure condition, not monitoring for a transmitter failure condition as the limitation requires. Thus, Birch fails to disclose or render obvious a "gas fuel control pressure transmitter failure."

G. GR. 18A and 18B: SC 53 Not Obvious.

First, GRs 18A and 18B fail for the same reasons discussed above in § IV.D.

Second, Petitioners rely on U.S. Pat. Pub. No. 2008/0288115 ("Rusnak") for monitoring "the torque." *Id.* at 20. But Rusnak teaches against monitoring the torque. EX-1007, ¶ [0004]; EX-2107, ¶ 126. Instead, Rusnak teaches "internally monitoring automatically output current and voltage of the VFD to the AC motor without the need for an external [torque] sensor." EX-1007, ¶ [0005]; EX-2107, ¶ 126. Indeed, Rusnak's method does not require measuring the torque value, as Dr. Durham concedes. EX-2108, 65:19-66:6 ("Q: [Rusnak] is not expressly discussing measuring the torque value, as opposed to setting power limits. Correct? A: Correct. I can -- I can agree that Rusnak's method does not require measuring the torque value. It monitors it from the standard performance curves and the Affinity relationships based on speed."); EX-2107, ¶ 126. Rusnak thus teaches away from monitoring the torque, and Petitioners' obviousness argument thus fails.

H. GR. 19A and 19B: SC 55 Not Obvious.

First, GRs 19A and 19B fail for the same reasons discussed above in § IV.D.

Second, Petitioners rely on Thompson for the limitation “wherein signaling is transmitted over armored shielded CAT5E cabling,” but this argument fails for the same reasons discussed above in § IV.C.

I. GR. 20A and 20B: SC 44 Not Obvious.

First, GRs 20A and 20B fail for the same reasons discussed above in § IV.A.

Second, Petitioners rely on U.S. Pat. No. 7,455,138 (“Delaney”) for limitations 44c and 44d. But Delaney is non-analogous art. Delaney is directed to a “hydraulic vehicle power take off [“PTO”] system” where “PTO systems are auxiliary systems, such as hoists, lifts, and pumps” that are “directly or indirectly powered by the vehicle’s engine.” EX-1059, Abstract, 1:16-18. Delaney is thus not related to oil fracking systems or subsystems such as those of the ’992 Patent, and a POSITA would not be motivated to consult Delaney.

J. GR. 21A and 21B: SC 58 Not Obvious.

First, GRs 21A and 21B fail for same reasons discussed above in § IV.D.

Second, Coli does not specifically discuss monitoring transformers as SC 58 requires. Dr. Durham admits as much. EX-2108, 53:9-14; EX-2107, ¶ 130. It would not have been obvious for Coli’s system to monitor “the transformers” based on Coli or any ARs. EX-2107, ¶¶ 128–131.

Dated: December 22, 2025

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that this response complies with the page limits of 37 C.F.R. § 42.24(c)(3) because it does not contain more than 12 pages.

The undersigned further certifies that this Petition complies with the typeface requirements of 37 C.F.R. § 42.6(a)(2)(ii) and typestyle requirements of 37 C.F.R. § 42.6(a)(2)(iii) and (iv). This petition has been prepared using Microsoft Word in Times New Roman 14-point font.

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CERTIFICATE OF SERVICE

I hereby certify that on this 22nd day of December, 2025, I caused to be served a true and correct copy of the foregoing “**PATENT OWNER’S REPLY TO PETITIONERS’ OPPOSITION TO PATENT OWNER’S REVISED MOTION TO AMEND UNDER 37 C.F.R. § 42.121**” and accompanying exhibits by electronic mail on the following:

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