

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.

IPR2025-00031
Patent 10,655,435 B2

Before MEREDITH C. PETRAVICK, GEORGE R. HOSKINS, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

HOSKINS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Liberty Energy, Inc. and Liberty Oilfield Services LLC (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of U.S. Patent No. 10,655,435 B2 (Ex. 1001, “the ’435 patent”), claims 1–19.

U.S. Well Services, LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”) opposing institution of review.

With prior authorization from the Board, Petitioner filed a Preliminary Reply (Paper 7, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 8, “Prelim. Sur-reply”).

Pursuant to 35 U.S.C. § 314(a), institution of review requires the information in the record to show a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. Applying that standard on behalf of the Director (37 C.F.R. § 42.4(a)), we institute the petitioned review.

II. BACKGROUND

A. *Real Parties in Interest and Related Proceedings*

Petitioner identifies its real parties in interest as: Liberty Energy, Inc.; Liberty Oilfield Services LLC; and Liberty Advanced Equipment Technologies LLC. *See* Pet. 1. Patent Owner identifies its real parties in interest as: U.S. Well Services, LLC; U.S. Well Services Holdings, LLC; ProFrac Manufacturing, LLC; and ProFrac Services, LLC. *See* Paper 4, 2.

The parties identify *U.S. Well Services, LLC, et al. v. Liberty Energy, Inc., et al.*, Case. No. 4:24-cv-00839-KPE (S.D. Tex.) (“the District Court Litigation”), as a related matter. *See* Pet. 1; Paper 4, 2.

B. The '435 Patent Specification

The '435 patent is directed to a smart hydraulic fracturing system. *See* Ex. 1001, codes (54) and (57). Figure 2 of the '435 patent is reproduced below.

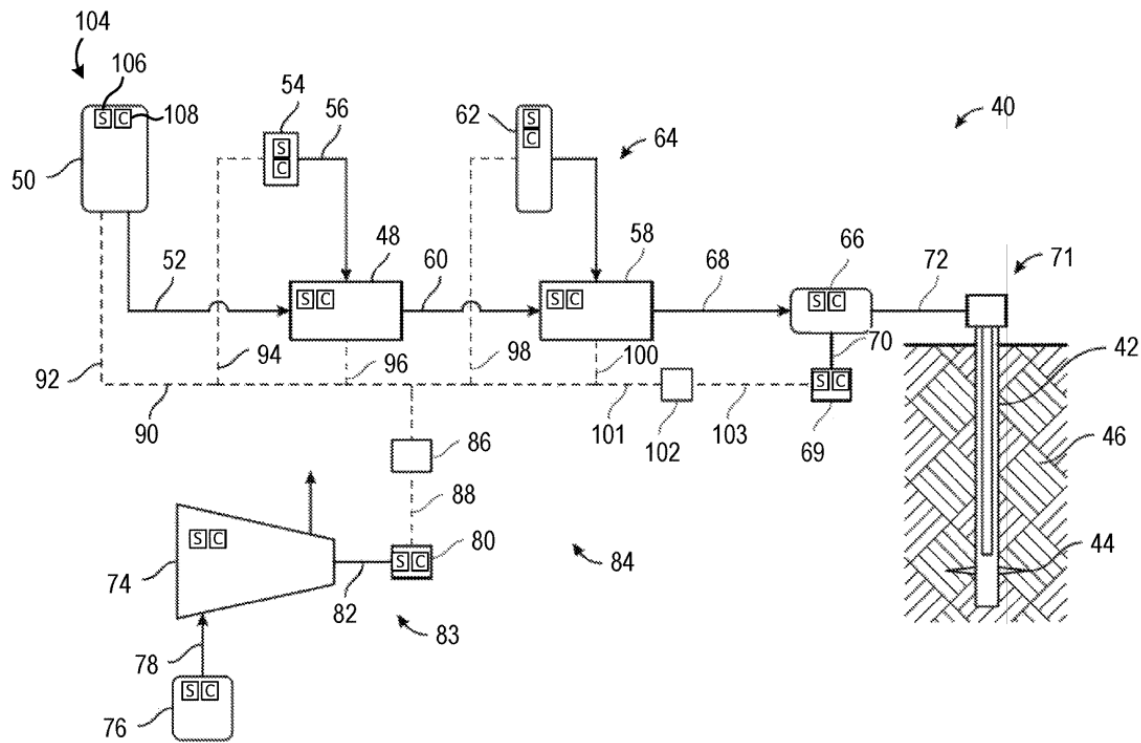


FIG. 2
'435 Patent, Figure 2.

Figure 2 is a schematic diagram of automated hydraulic fracturing system 40, used to pressurize wellbore 42 to create fractures 44 in subterranean formation 46. *See id.* at 2:34–36, 3:60–63. System 40 comprises several components, as follows.

Hydration unit 48 mixes fluid (e.g., water) from fluid source 50 with additives from additive source 54. *See id.* at 3:64–4:8, 5:16–20. Blender unit 58 blends the fluid/additive mixture with proppant (e.g., sand) from proppant source 62 to form a fracturing fluid, which is transferred to pump

system 66. *See id.* at 4:8–16, 6:41–42. Pump system 66 is powered by electric motor 69 and increases the pressure of the fracturing fluid from about 80–100 psi to about 15,000 psi. *See id.* at 4:22–29. Pump system 66 outputs the fracturing fluid to discharge piping 72 for delivery to wellhead assembly 71 and then into the well. *See id.* at 4:30–37, Fig. 2. Pump system 66 may comprise several pumps, each of which outputs fracturing fluid into a manifold distribution system such as a manifold that consolidates the outputs for delivery to wellhead 71. *See id.* at 3:29–55 (Fig. 1).

Electricity generator 80 generates electricity to power various components in system 40 via micro-grid 84 and power bus 90. *See id.* at 4:54–5:15, Fig. 2. Generator 80 generates electricity utilizing turbine 74 fueled by a combustible fuel (e.g., natural gas) from fuel source 76. *See id.* at 4:43–5:15.

The '435 patent states that “[c]onventionally” the components of hydraulic fracturing systems were “independent systems that [were] individually controlled by operators,” which required “a large amount of operator intervention to diagnose, interpret, respond to, adjust, and otherwise control operating conditions of the various components.” *Id.* at 1:29–36. The inventors of the '435 patent therefore devised a control system for generating automated control instructions to operate a hydraulic fracturing system, based on sensor data collected from various components in the system. *See id.* at 1:37–2:5.

Thus, as shown in Figure 2, several instrumentation devices 104 comprising sensors 106 (“S”) and controllers 108 (“C”) are arranged throughout system 40. *See id.* at 5:25–50. A data van (not shown in Figure 2) collects and analyzes the sensor data to generate automated control

instructions issued to the various component controllers in the system. *See id.* at 3:55–59 (Fig. 1), 6:10–39.

C. The '435 Patent Claims

The '435 patent includes nineteen claims, all of which are challenged in the Petition, including three independent claims 1, 7, and 13. *See* Ex. 1001, 11:64–14:38; Pet. 6 (listing Petitioner's challenges).

Independent claim 1 illustratively recites:

1. A hydraulic fracturing system, comprising:
 - a plurality of pumps positioned at a wellsite and configured to pressurize a fracturing fluid;
 - a distribution system fluidly coupled to receive and consolidate fracturing fluid from the plurality of pumps for injection into a wellhead; and
 - a control system comprising:
 - a plurality of sensing devices configured to measure one or more parameters of the plurality of pumps and the distribution system;
 - one or more processing devices configured to receive a first parameter from a first device of the plurality of pumps, the distribution system, or the wellhead, and transmit the first parameter to a second device of the plurality of the plurality [sic] of pumps, the distribution system, or the wellhead, and detect that the first parameter is outside of an acceptable threshold; and
 - generate automated control instructions at the second device based at least in part on the first parameter; and
 - one or more control devices configured to receive the automated control instructions and automatically adjust one or more aspects of the second device based on the control instructions.

Ex. 1001, 11:65–12:22.

D. Asserted Prior Art

Petitioner relies on the following four references as prior art against the '435 patent. *See* Pet. 4–6.

Name	Reference	Exhibit No.
Norris	WO 2017/040921 A1	1004
Omont	WO 2016/019219 A1	1005
Borgstadt	US 2009/0053072 A1	1006
Dykstra	US 2008/0236818 A1	1007

Patent Owner does not dispute at this time that these references are prior art against the '435 patent. *See, e.g.*, Pet. 4 (priority date), 4–5 (Norris), 5 (Omont and Borgstadt), 6 (Dykstra); Prelim. Resp. 3 (effective filing date).

E. Asserted Grounds

Petitioner asserts five unpatentability grounds, as follows. *See* Pet. 6.

35 U.S.C. § ¹	Reference(s)	Claims Challenged
102	Norris	1–5, 7, 13, 14, 16, 17
103	Norris	1–5, 7, 13, 14, 16, 17
103	Norris, Omont	1–7, 10–17
103	Norris, Borgstadt	1–5, 7–19

¹ Amendments to 35 U.S.C. §§ 102 and 103 enacted by the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) took effect in March 2013. The earliest possible effective filing date for the '435 patent is in October 2017. *See* Ex. 1001, code (60). Therefore, we apply the AIA versions of §§ 102 and 103.

35 U.S.C. § ¹	Reference(s)	Claims Challenged
103	Norris, Dykstra	1–7, 13–17

F. Testimonial Evidence

Petitioner relies on the proffered expert witness testimony of Robert A. Durham, Ph.D. (Exhibit 1003). Patent Owner does not rely on opposing expert witness testimony at this time.

III. POTENTIAL DENIAL UNDER 35 U.S.C. § 314(a)

Patent Owner, relying on *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”), contends we should deny institution under 35 U.S.C. § 314(a) based on the status of the District Court Litigation. *See* Prelim Resp. 2, 47–50; Prelim. Sur-reply 1–5. Petitioner disagrees. *See* Pet. 7–9; Prelim. Reply 1–5. For the following reasons, we decide not to deny institution on this basis.

A. Legal Authority

Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances); *SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 366 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review.” (emphasis omitted)); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d

1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”).

When determining whether to exercise discretion to deny institution in view of a parallel district court proceeding, we consider the following six factors (“*Fintiv* factors”):

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Fintiv, at 5–6. These *Fintiv* factors relate to “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* In evaluating the *Fintiv* factors, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review,” recognizing “there is some overlap among these factors” and “[s]ome facts may be relevant to more than one factor.” *Id.* at 6.

B. Analysis of the Fintiv Factors

We consider each of the *Fintiv* factors. We then weigh the factors and take a holistic view of whether efficiency and integrity of the patent system are best served by denying or instituting review.

*1. Factor 1:
whether a stay exists or is likely to be granted if review is instituted*

The briefs filed in this proceeding indicate neither party has moved for a stay of the District Court Litigation. *See* Prelim. Resp. 2, 47; Prelim. Reply 1; Prelim. Sur-reply 1. We are aware, however, that Petitioner moved for a stay of the District Court Litigation on March 19, 2025,² pending resolution of this proceeding and other IPR proceedings filed by Petitioner against patents asserted in the Litigation. *See* IPR2025-00066, Paper 8 & Ex. 1051. As of the date of this Decision, the Court has not yet ruled on that motion.

Petitioner argues “*Fintiv* cautions against speculating whether the district court would grant a stay,” so “[t]he absence of a stay is, at most, neutral.” Prelim. Reply 1 (citing *Fintiv*, at 12); *see also* Pet. 8 (“The Board has treated related factors as neutral after declining to speculate on the outcome of a stay motion.” (citing *HP Inc. v. Slingshot Printing LLC*, IPR2020-01084, Paper 13 at 9 (PTAB Jan. 14, 2021))).

Patent Owner argues “Factor 1 weighs in favor of denying institution or, alternatively, is at best neutral” because, when the Preliminary Sur-reply was filed, “it remain[ed] purely speculative whether a stay motion will be filed.” Prelim. Sur-reply 1; *see also* Prelim. Resp. 47–48 (“Petitioner’s admission that it might not even file a stay . . . weighs in favor of denying institution or, alternatively, is neutral.”).

We conclude *Fintiv* factor 1 is neutral, because it is unknown at this time whether the Court will grant Petitioner’s motion to stay the District Court Litigation.

² Preliminary briefing in this case was completed on March 7, 2025.

2. *Factor 2:*
proximity of the Court's trial date to the Board's statutory deadline

As presently scheduled, trial in the District Court Litigation is set to begin on February 2, 2026. *See* Prelim. Resp. 2, 48 (citing Ex. 2006, 4). The Board's one-year statutory deadline for issuing a final decision in this proceeding will fall in late April 2026.

Patent Owner argues that, because "the currently scheduled trial date will likely occur before the Board issues its final written decision, this factor weighs in favor of denial of institution." Prelim. Resp. 48–49 (citing *Fintiv*, at 9).

Petitioner responds that *Fintiv* factor 2 favors institution because the District Court Litigation "is just beginning." Pet. 8. Petitioner cites the June 21, 2022, USPTO Memorandum, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (Ex. 1011, hereafter "June 2022 Office Memo"), which states: "Parties may present evidence regarding the most recent statistics on median time-to-trial for civil actions in the district court in which the parallel litigation resides for the PTAB's consideration." Ex. 1011, 8–9; *see* Pet. 8. Petitioner accordingly provides statistics indicating that the median time-to-trial in the Southern District of Texas is 30 months. *See* Pet. 8 (citing Ex. 1012, 36).

Petitioner adds that "[t]he schedule in parallel district court litigation is slipping," because the *Markman* hearing "has been taken off the calendar, and subsequent case deadlines are keyed off the Markman Ruling." Prelim. Reply 1 (citing Ex. 1029; Ex. 2006, 3). Petitioner asserts "[t]he amount the case will be delayed remains unclear, and the current trial date will likely

change.” *Id.* Petitioner further asserts updated “time-to-trial statistics place the parallel trial in November 2026, approximately five months *after* the expected date for a Final Written Decision.” *Id.* (citing Ex. 1028, 36).

Patent Owner replies that, although “the *Markman* hearing was recently rescheduled, the February 2, 2026, trial date still stands.” Prelim. Sur-reply 1 (citing Ex. 2006, 4). According to Patent Owner, “the [District Court’s] schedule allows for . . . deadlines to move without affecting the close of fact discovery and service of opening expert reports,” and “Petitioner needs the entire case schedule to slip by nearly three months just to have a chance that the Board’s final decision will occur before the trial date” and therefore avoid *Fintiv* factor 2 weighing in favor of denying institution. *Id.* at 1–2 (citing Ex. 2006, 3; *Fintiv*, at 9). Patent Owner asserts “Petitioner cites no evidence suggesting that the Court will delay trial by any significant degree.” *Id.* at 2 (citing Ex. 1029). Finally, Patent Owner argues Petitioner’s reliance on the June 2022 Office Memo’s discussion of time-to-trial statistics should be rejected, because that guidance was rescinded on February 28, 2025 (the same day Petitioner’s Preliminary Reply was filed). *See id.* (citing Ex. 2008, 4).

We conclude *Fintiv* factor 2 slightly favors denial of institution. As Patent Owner points out, the Court’s trial date continues to be set for February 2, 2026. However, it is also true that the Court has set back the *Markman* hearing by over two months (from February 20, 2025 to April 30, 2025),³ and the Court’s overall case schedule is premised upon a claim construction decision being entered by April 3, 2025. *See* Ex. 2006, 3 (Items

³ *See* Ex. 1029; IPR2025-00066, Paper 9 & Ex. 2027.

#13 – #18). The Court’s Scheduling Order emphasizes: “*If [a Markman] ruling is late* [which is now guaranteed], *parties may seek amendment of remaining dates in Scheduling Order*,” including the trial date. *Id.* at 3–4 (Items #14, #26). It seems very likely, then, that the trial date will be set back by at least a few weeks, which would fall “*around the same time* as the projected statutory deadline,” in which case “the decision whether to institute will likely implicate other [*Fintiv*] factors.” *Fintiv*, at 9 (emphasis added). That conclusion is supported by the Court’s median time-to-trial statistics which, as applied to this case, peg the median trial date in November 2026. *See* Prelim. Reply 1; *see also* March 24, 2025, UPSTO Memorandum, *Guidance on USPTO’s rescission of “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation”* (hereafter “March 2025 Office Memo”)⁴, at 3 (“[T]he Board may consider any evidence that the parties make of record that bears on the proximity of the district court’s trial date . . . including median time-to-trial statistics[.]”).

3. *Factor 3:*
investment in the parallel proceeding by the Court and parties

Patent Owner asserts “[t]he parties and Court have already invested substantial resources” in the District Court Litigation, including the preparation of briefs in advance of the *Markman* hearing. Prelim. Resp. 2, 49 (citing Ex. 2006); Prelim. Sur-reply 2.

⁴ Available at https://www.uspto.gov/sites/default/files/documents/guidance_memo_on_interim_procedure_rescission_20250324.pdf.

Petitioner responds that the Petition was “promptly filed” less than three months after Petitioner received Patent Owner’s infringement contentions in the District Court Litigation on July 18, 2024. Pet. 8; Prelim. Reply 1 (citing Ex. 2006). According to Petitioner, “[t]his ‘diligent’ filing favors institution,” and “the Board has credited petitioners for filing petitions as many as four months after receiving infringement contentions.” Pet. 8 (citing *Fintiv*, at 11; *Corning Optical Commc ’ns LLC v. Dali Wireless, Inc.*, IPR2021-00762, Paper 8 at 9–10 (PTAB Oct. 31, 2021)); Prelim. Reply 2. Petitioner similarly asserts that the filing of its Petition within one month of serving its initial invalidity contentions in the District Court Litigation weighs in favor of not denying institution. Prelim. Reply 2 (citing Ex. 2007, 34; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 17 (PTAB Dec. 1, 2020) (precedential)).

Petitioner adds that the District Court “has invested minimal effort on invalidity issues,” as no *Markman* hearing has been held and “[n]o significant rulings have been made on invalidity or prior art issues,” and fact discovery is not set to close until July 10, 2025. Prelim. Reply 2 (citing Ex. 2006). According to Petitioner, “[t]he Board consistently grants institution in similar settings.” *Id.* at 2–3 (citations omitted). Petitioner concludes the District Court’s “minimal investment” tips *Fintiv* factor 3 in favor of institution. *Id.* at 3.

Patent Owner replies that “Petitioner’s delay in filing its Petition after waiting for plaintiff’s infringement contentions is not an excuse, given that Petitioner challenged every claim of the ’435 patent.” Prelim. Resp. 49. Patent Owner’s view is that “if Petitioner had prior art that it believed would find all patent claims unpatentable, there was no need to wait for [Patent

Owner's] infringement contentions, particularly given that [the Petition] has identified no claim construction issues that were raised in the contentions." *Id.* Patent Owner concludes *Fintiv* factor 3 "is either neutral or weighs in favor of denial." *Id.*

Patent Owner adds that the Court "anticipates issuing a ruling 'within 6 weeks after the Markman hearing'" being held. Prelim. Sur-reply 2 (citing Ex. 2006, 3). Further according to Patent Owner, "Petitioner's arguments do not address the significant resources that the parties and the Court will have undertaken by the time the Board decides whether to institute," and even if Petitioner was diligent in filing its Petition "that does not negate the significant resources invested by the Parties or the Court, as shown by the inapposite cases cited in Petitioner's reply." *Id.* at 2–3 (citing Prelim. Reply 2) (citations omitted). Thus, Patent Owner concludes *Fintiv* factor 3 "is either neutral or weighs in favor of denial." *Id.* at 3.

We conclude *Fintiv* factor 3 weighs against exercising discretion to deny institution. The parties have engaged in preliminary discovery in the District Court Litigation, including briefing on claim construction, but the *Markman* hearing has not yet been held and no claim construction rulings have been issued. Furthermore, so far as the evidence presented here indicates, the Court has not issued any other significant rulings in the case. *See Fintiv*, at 10 ("If, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution.").

Moreover, Petitioner was reasonably diligent in filing the Petition. Patent Owner's infringement contentions play an important role in that regard. They inform Petitioner of the claims that are in fact at issue, as well

as how Patent Owner views the scope of the claims, both of which are material considerations in preparing a petition. *See Fintiv*, at 11 (“If the evidence shows that the petitioner filed the petition expeditiously, such as promptly after becoming aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution.”).

4. *Factor 4:*
overlap between issues raised in the Petition and in Court

Patent Owner argues Petitioner has not filed a stipulation pursuant to *Sotera, supra*, “which increases the likelihood that” the Board and the District Court “will address the same invalidity issues and possibly reach conflicting decisions.” Prelim. Resp. 2, 49–50. Patent Owner asserts “the same prior art and proposed combinations set forth in the Petition are used in Petitioner’s invalidity contentions” in the District Court Litigation. *Id.* at 50 (citing Ex. 2007, 4, 23). Patent Owner concludes *Fintiv* factor 4 “weighs in favor of denying institution.” *Id.*

Petitioner replies with the following stipulation:

Petitioner stipulates that, if the Board institutes IPR in this proceeding on the grounds presented in the Petition, Petitioner will not pursue an invalidity defense in the district court action (C.A. No. 4:24-cv-00839) [i.e., the District Court Litigation] that the patent claims subject to the instituted IPR are invalid based on the grounds that were raised or any grounds Petitioner reasonably could have raised in the IPR.

Prelim. Reply 3. Petitioner asserts that, pursuant to the June 2022 Office Memo, “this *Sotera* stipulation prevents discretionary denial.” *Id.* (citing Ex. 1011). Petitioner concludes “*Fintiv* factor 4 favors institution.” *Id.*

Patent Owner replies that the June 2022 Office Memo has been rescinded, such that Petitioner’s *Sotera* stipulation “is no longer controlling

and is not enough to overcome the other [*Fintiv*] factors.” Prelim. Sur-reply 1, 3–4 (citing Ex. 2008, 4, 8–9; Prelim. Reply 3).

Pursuant to the March 2025 Office Memo (at 2–3), “a timely-filed *Sotera* stipulation [such as set forth in Petitioner’s Preliminary Reply] is highly relevant, but will not be dispositive by itself,” such that “the Board will consider such a stipulation as part of its holistic analysis under *Fintiv*.” Applying that guidance here, we conclude *Fintiv* factor 4 weighs in favor of not exercising discretion to deny institution, because Petitioner’s *Sotera* stipulation mitigates concerns of duplicative efforts and potentially conflicting decisions. *See Sotera*, at 19.

5. *Factor 5:*
whether the petitioner and the defendant in the parallel proceeding
are the same party

Petitioner is the Defendant in the District Court Litigation, and the parties agree *Fintiv* factor 5 therefore weighs in favor of denying institution. *See* Prelim. Resp. 50; Prelim. Reply 3; Prelim. Sur-reply 4. Accordingly, we conclude *Fintiv* factor 5 weighs in favor of denying institution.

6. *Factor 6:*
other circumstances that impact the Board’s exercise of discretion,
including the merits

In the Petition, Petitioner argues “the merits of this Petition are particularly strong, with compelling art and arguments.” Pet. 7.

Patent Owner responds that “the Petition’s Grounds are deficient” based on Patent Owner’s arguments concerning the merits, which we address below. Prelim. Resp. 50. Patent Owner’s further view is that “the merits of those Grounds are not ‘compelling,’ but instead are (at best for

Petitioner) ‘a closer call.’” *Id.* (citing *Fintiv*, at 15). Patent Owner concludes *Fintiv* factor 6 “thus weighs in favor of denying institution.” *Id.*

Petitioner replies that “[t]he strength of the Petition strongly favors institution,” and briefly addresses Patent Owner’s arguments on the merits. Prelim. Reply 3–4. Patent Owner replies in kind. *See* Prelim. Sur-reply 4.

Pursuant to the March 2025 Office Memo (at 3), “the factors considered in the exercise of discretion are part of a balanced assessment of all the relevant circumstances in the case, including the strength of the merits,” but “compelling merits alone is not dispositive” as had been the case under the June 2022 Office Memo. Based on our review of the arguments and evidence on the merits, we conclude *Fintiv* factor 6 is neutral in deciding whether to exercise discretion to deny institution. There are strengths and weaknesses in both parties’ arguments on the merits, but nothing so material so as to impact the *Fintiv* analysis in favor of instituting review or denying review.

7. Conclusion

As noted in *Fintiv*, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Fintiv*, at 6.

Considering the *Fintiv* factors (summarized above) as a whole, we find that trial in the District Court will not begin any earlier than February 2, 2026, and the trial date is very likely to be set back by at least a few weeks due to the delayed *Markman* process to fall around the same time as the Board’s late April 2026 statutory deadline, so the *Fintiv* analysis turns on other factors. *See Fintiv*, at 9. Further, the evidence presented here indicates

the parties and the Court have not yet made a significant investment in the District Court Litigation, and Petitioner's *Sotera* stipulation mitigates concerns of duplicative efforts and potentially conflicting decisions. Overall, we determine that efficiency and integrity of the patent system are best served by not exercising discretion to deny institution based on the District Court Litigation.

We note that the Director's recent decision in *Motorola Sols., Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19 (PTAB Mar. 28, 2025), turned on materially different facts than those presented here. In that case, the Director granted review of the Board's institution decision, and held the Board erred in its fact-finding concerning *Fintiv* factors 3 and 4. *See id.* at 2. Concerning *Fintiv* factor 3, "the parties had served extensive infringement and invalidity contentions, served opening and rebuttal expert reports, filed claim construction briefs, and conducted several depositions," and "[t]he court had held a claim construction hearing and construed the disputed claim terms" in preparation for a trial set to begin eleven months before the Board's statutory deadline. *Id.* at 3. By contrast, in the present case: opening expert reports are not due until July 24, 2025, with rebuttal reports due August 21, 2025 (*see* Ex. 2006, 3 (Items #19 – #20)); no *Markman* hearing has been held and no claims have been construed; and trial is likely to begin around the same time as the Board's statutory deadline for a final decision.

Concerning *Fintiv* factor 4, the Director's *Motorola* decision found "Petitioner's stipulation [did] not ensure that [the IPR proceeding] would be a 'true alternative' to the district court proceeding," because "Petitioner's invalidity arguments in the district court [were] more expansive [than in the

petition] and include[d] combinations of the prior art asserted in [the IPR proceeding] with unpublished system prior art, which Petitioner’s stipulation [was] not likely to moot.” *Motorola*, IPR2024-01205, Paper 19 at 3–4. In the present case, Petitioner’s invalidity contentions in the District Court also appear to rely in part on non-public system art. *See, e.g.*, Ex. 2007, 14 (identifying the Lime Instruments System), 23 (listing Petitioner’s invalidity challenges to the ’435 patent, one of which relies on the “LI System”). Nonetheless, unlike in the *Motorola* case, the present case does not involve “substantial investment” in the District Court Litigation per *Fintiv* factor 3 (*Motorola* at 3–4), as discussed above. Thus, even discounting the weight of Petitioner’s *Sotera* stipulation as the Director did in the *Motorola* case, we still conclude the *Fintiv* factors as a whole indicate that the efficiency and integrity of the patent system are best served by instituting review.

IV. PETITIONER’S UNPATENTABILITY GROUNDS

A. Legal Standards — Petitioner’s Burden

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

B. Legal Standards — Anticipation

A patent claim is unpatentable as anticipated under 35 U.S.C. § 102 “if each and every limitation is found either expressly or inherently in a single prior art reference.” *WhitServe, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 21 (Fed. Cir. 2012) (quoting *Celeritas Techs., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998)). An anticipatory reference must further “disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

C. Legal Standards — Obviousness

A patent claim is unpatentable as having been obvious under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. *See* 35 U.S.C. § 103; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, if made available in the record. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

D. Level of Ordinary Skill in the Art

Petitioner contends a person having ordinary skill in the art pertaining to the '435 patent “would have either (1) a Bachelor of Science in Mechanical, Electrical, or Petroleum Engineering or an equivalent field, and at least 2 years of academic or industry experience in the oil and gas industry, including well drilling, completion, or production, or (2) at least four years of oil and gas industry experience including well drilling, completion, or production.” Pet. 7; Ex. 1003 ¶ 51.

“Patent Owner applies the same skill level proposed by Petitioner.” Prelim. Resp. 15 (citing Pet. 7).

For purposes of this Decision, we adopt the level of ordinary skill in the art as articulated by Petitioner because, based on the current record, it is not disputed, and it appears to be consistent with the '435 patent and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

E. Claim Construction

We interpret the '435 patent claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). This “includ[es] construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

Petitioner does not present any claim construction arguments in the Petition. *See* Pet. 7.

Patent Owner construes the phrase “detect that the first parameter is outside an acceptable threshold” as recited in all three independent claims 1, 7, and 13. Ex. 1001, 12:14–15 (claim 1), 12:63–64 (claim 7), 14:9–10 (claim 13); *see* Prelim. Resp. 16 (“Patent Owner addresses claim construction positions, if any, in the body of its arguments below.”); *id.* at 16–22. We address this argument below in Section IV.F.2(ii), as part of resolving the parties’ dispute over whether Norris discloses this claimed subject matter.

Apart from that issue, and based on the arguments and evidence presented at this time, we determine no explicit construction is needed to resolve the parties’ controversy. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

F. Ground One — Alleged Anticipation by Norris

In Ground One, Petitioner asserts claims 1–5, 7, 13, 14, 16, and 17 of the ’435 patent are unpatentable as anticipated by Norris. *See* Pet. 4–5, 6, 10–31. Patent Owner disagrees. *See* Prelim. Resp. 6–10, 16–22, 24–28, 45–46.

We summarize the disclosure of Norris, then we consider the parties’ competing contentions, and we conclude Petitioner has shown a reasonable likelihood of prevailing on its assertions for at least claim 1.

I. Norris

Norris is directed to a pump management system that substantially maintains non-coincidental operation of a plurality of pumps in a wellbore servicing system, to reduce pressure fluctuation stresses on downstream components. *See* Ex. 1004, codes (54) and (57), ¶¶ 2–3, 18. Figure 2 of Norris is reproduced below.

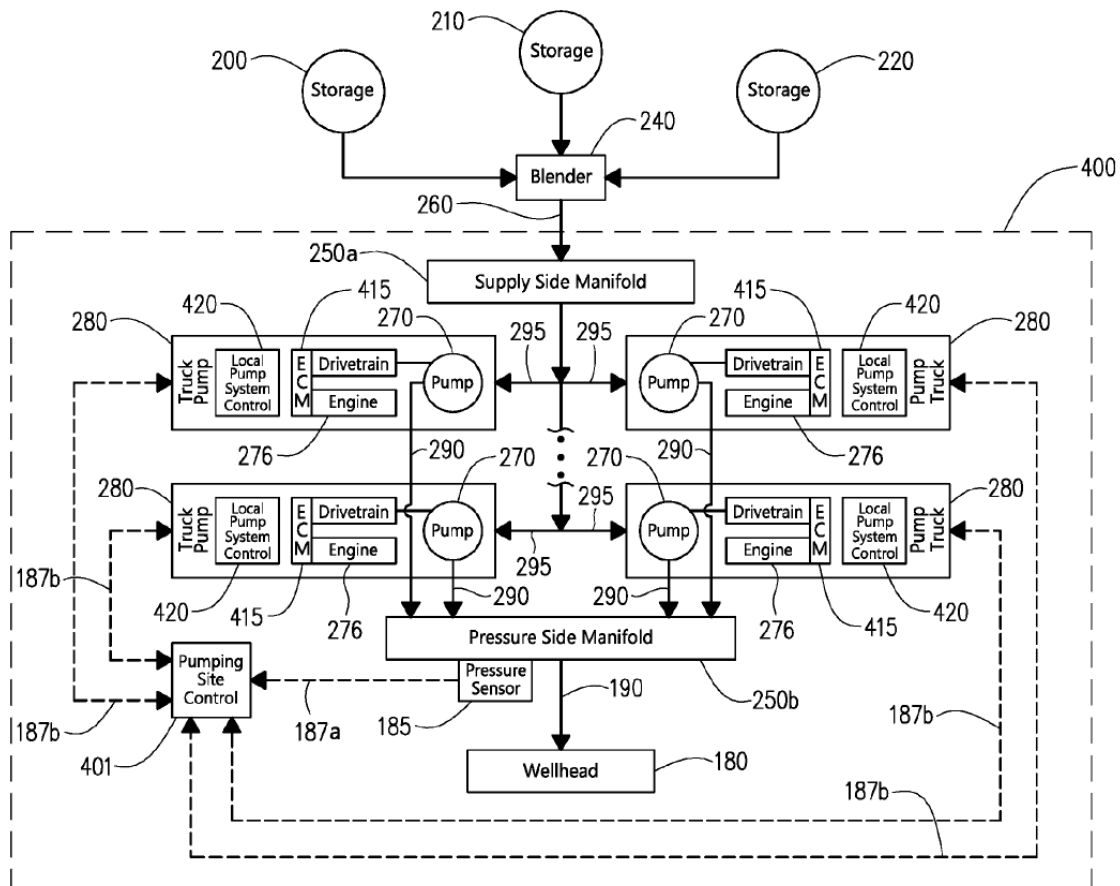


FIG. 2

Norris, Figure 2.

Figure 2 is a schematic view of pump management system 400. *See id.* ¶¶ 8, 21. Storage vessels 200, 210, and 220 store water, additives, and proppant that are blended in blender 240 to form a wellbore servicing fluid, which is delivered to supply-side manifold 250a and thereby to a plurality of

pumps 270 (four of which are shown in Figure 2). *See id.* ¶¶ 21–23. The pumps pressurize the wellbore servicing fluid “[t]o provide the necessary pressure for downhole operations such as fracturing,” and deliver the pressurized fluid to pressure-side manifold 250b and thereby to wellhead 180. *Id.* ¶¶ 22–23.

Each pump 270 is mounted on its own pump truck 280, and is driven by drivetrain 276 including an electric motor or a hydrocarbon-powered engine as controlled by electronic control module 415 and/or local pump control system 420. *See id.* ¶¶ 24, 32, 35. System 420 “manages the operation of the drivetrain 276 to drive pump 270 at the desired rate.” *Id.* ¶ 35.

Application controller 401 manages the overall pumping operation by controlling each local pump control system 420. *See id.* ¶¶ 29, 36. Application controller 401 receives real time data “from sensors and other data processors associated with pump trucks 280, pressure-side manifold 250b and other monitored applications.” *Id.* ¶ 29. This data includes: the output pressure and flow rate of each pump 270; the fluid pressure within pressure-side manifold 250b (via pressure sensor 185); the outlet flow rates of pressure-side manifold 250b and wellhead 180; and other parameters. *See id.* ¶¶ 29–31, 35 and Figs. 3A–3B.

“The operational parameters input into application controller 401 determine the desired pressure and flow rates at pressure side manifold 250b and wellhead 180.” *Id.* ¶ 37. Then, “[u]pon variation from the desired settings, [application controller 401] will signal each [local pump control system 420] to increase or decrease pumping operations,” such that “[t]he

resulting change in pumping operations will restore the desired pressure and flow rates at pressure side manifold 250b and wellhead 180.” *Id.*

2. *Claim 1*

Petitioner provides arguments and evidence in support of contending claim 1 is unpatentable as anticipated by Norris. *See* Pet. 4–5, 10–26; Ex. 1003 ¶¶ 95–98, 119–195. Patent Owner opposes. *See* Prelim. Resp. 16–22, 24–28, 45–46. For the following reasons, we conclude Petitioner has shown a reasonable likelihood of prevailing on its assertions for claim 1.

(i) *Petitioner’s Unopposed Contentions*

Petitioner contends Norris provides, per claim 1, a hydraulic fracturing system comprising a plurality of pumps 270 positioned at a wellsite to pressurize a fracturing fluid, as well as a distribution system (i.e., pressure-side manifold 250b) that consolidates fracturing fluid from the pumps for injection into wellhead 180. *See* Pet. 10–12; Ex. 1003 ¶¶ 120–126. Petitioner asserts Norris includes a control system composed of application controller 401 and local pump control systems 420, along with a plurality of sensing devices to measure one or more parameters of pumps 270 and distribution system 250b. *See* Pet. 12–14; Ex. 1003 ¶¶ 127–134.

Petitioner asserts Norris’s control system particularly includes a processing device (i.e., application controller 401) configured to: receive a first parameter from a first device (i.e., the pressure within pressure-side manifold 250b as measured by pressure sensor 185); transmit the first parameter to a second device (i.e., one of the pump trucks 280); and generate automated control instructions at the second device based at least in part on

the first parameter. *See* Pet. 14–21; Ex. 1003 ¶¶ 135–168.⁵ Petitioner asserts Norris’s control system further includes control devices (i.e., local drivetrain controller 405 of system 420, or ECM 415) configured to receive the automated control instructions and automatically adjust one or more aspects of the second device based on the control instructions. *See* Pet. 18, 21; Ex. 1003 ¶¶ 151–152, 167–168.

We conclude Petitioner’s foregoing contentions, which Patent Owner does not oppose at this time, are supported sufficiently by the cited disclosures in Norris and the testimony of Dr. Durham to justify institution of review.

(ii) Petitioner’s Opposed Contention

Patent Owner opposes Petitioner’s contention that Norris’s “processing device[] [is] configured to . . . detect that the first parameter is outside of an acceptable threshold” per claim 1. Ex. 1001, 12:8–15. For the following reasons, we conclude this contention is supported sufficiently by the evidence of record to justify institution of review.

(a) The Petition

Petitioner argues and Dr. Durham testifies that Norris’s processing device (i.e., application controller 401) detects that the first parameter (i.e., the pressure within pressure-side manifold 250b) is outside of an acceptable threshold. *See* Pet. 16–17, 19–20; Ex. 1003 ¶¶ 141–144, 154–157, 162. In particular, according to Petitioner and Dr. Durham, application controller 401 “compares measured parameters to desired ‘operational

⁵ This is Petitioner’s Example 1A mapping. *See* Pet. 19–21. We do not reach Petitioner’s other Examples in this Decision. *See id.* at 21–26.

parameters’ and controls system (and component) operation based on the comparison.” Pet. 17, 20 (citing Ex. 1004 ¶ 37); Ex. 1003 ¶¶ 142, 162.⁶ Petitioner asserts: “‘Operational parameters input into application controller 401 determine the desired pressure and flow rates,’ and ‘upon variation from the desired settings,’ the application controller signals ‘to increase or decrease pumping operations.’” Pet. 17, 20 (citing Ex. 1004 ¶ 37); Ex. 1003 ¶¶ 142, 162. Thus, Petitioner concludes application controller 401 “‘detects that the first parameter is outside of an acceptable threshold’ by comparing measured and desired operational parameters.” Pet. 17, 20; Ex. 1003 ¶¶ 142, 162.

(b) Patent Owner’s Preliminary Response

Patent Owner responds that Petitioner “incorrectly maps Norris’s ‘desired settings’ to satisfy the claimed ‘*acceptable threshold*.’” Prelim. Resp. 1; *id.* at 9–10 (“Contrary to Petitioner’s contention . . . Norris’s teaching of desired settings (such as pressure and flow rates) does not satisfy the claimed ‘*acceptable threshold*.’”).

Concerning claim construction, Patent Owner asserts “maintenance of desired settings does not satisfy the claimed ‘*detect[ing] that a first parameter is outside of an acceptable threshold*,’” because “[d]esired rates . . . are not acceptable thresholds.” *Id.* at 16–17. Patent Owner particularly argues “[a]ny reasonable construction requires a threshold to

⁶ The Petition at page 20 cites paragraphs 178–180 of the Durham Declaration. That testimony, however, concerns Example 1B rather than Example 1A. We believe Petitioner here meant to cite paragraph 162 of the Durham Declaration, which is the corresponding testimony pertaining to Example 1A.

indicate a limit.” *Id.* at 18. In support, Patent Owner cites dictionary definitions of the word “threshold” as meaning:

“a level, point, or value above which something is true or will take place and below which it is not or will not” (Ex. 2002⁷); or
“an amount, level, or limit on a scale” such that “[w]hen the threshold is reached, something else happens or changes” (Ex. 2003⁸); or

“the point or level at which something begins or changes,” for example “sounds that are above/below the *threshold* of hearing” are “sounds that are too high/low to be heard” (Ex. 2004⁹).

Prelim. Resp. iv, 18. Patent Owner also cites *O2 Micro Int’l Ltd. v. Sumida Corp.*, 2005 WL 6127302, *3 (E.D. Tex. Mar. 8, 2005), as “construing the claimed term ‘threshold’ to mean ‘the value of current, voltage or other quantity at which something happens,’ which requires ‘certain events to occur if the value is at or above a threshold.’” Prelim. Resp. 18.

Second, Patent Owner asserts the claim term “acceptable” and Norris’s term “desired” “have inconsistent meanings, and the Petition provides no explanation to reconcile those differing meanings” thereby improperly “ignor[ing] the claim term ‘acceptable[.]’” *Id.* at 19–20 (citing Pet. 16–17) (case law citations omitted). Patent Owner argues this position is supported by the intrinsic evidence, because the ’435 patent specification “explains that the claimed ‘*acceptable threshold*’ is used to trigger actions

⁷ Merriam-Webster Dictionary (<https://www.merriam-webster.com/dictionary/threshold>, accessed Jan. 22, 2025).

⁸ Collins Dictionary (<https://www.collinsdictionary.com/us/dictionary/english-word/threshold>, accessed Jan. 30, 2025).

⁹ Britannica Dictionary (<https://www.britannica.com/dictionary/threshold>, accessed Jan. 29, 2025).

caused by exceedance of an operational limit — not an ideal or desired setting” (*id.* at 20), in the following passage:

In some embodiments, the method 160 [of Figure 6] also includes detecting that a first parameter of the one or more parameters is outside of an acceptable threshold, in which the first parameter is associated with a first pump of the plurality of pumps, and *automatically adjusting or turning off the first pump*. In some embodiments, the method 160 also includes adjusting one or more of the other pumps in the plurality of pumps to compensate for the first pump.

Ex. 1001, 10:4–11 (emphasis added). Patent Owner asserts a person of ordinary skill in the art “would understand the claimed threshold is an operational limit — not simply a desired output rate setting — because there would otherwise be no need to automatically” turn off the first pump as described in the specification. Prelim. Resp. 20–21 (citing Ex. 1001, 6:56–59, 7:63–66, 8:16–17, 8:25–28).

Patent Owner further articulates an “example” which “demonstrates the difference between Norris’s ‘desired rates’ and the claimed ‘acceptable threshold.’” *Id.* at 21–22. In this example, Patent Owner assumes Norris’s desired fluid flow rate is 1,000 liters per minute, and asserts a person of ordinary skill in the art would understand Norris to teach “measuring the flow rate and operating the pumps to keep the fluid pumping rate as close to the ‘desired rate’ of 1,000 liters/min as possible.” *Id.* Claim 1, by Patent Owner’s contrast, requires that the “‘acceptable threshold’ is used to, e.g., ensure safe and efficient equipment operation,” wherein “[a]n ‘acceptable threshold’ may then be set for the pump, e.g., 1,100 liters/min.” *Id.* at 22 (citing Ex. 1001, 5:65–6:9). Then: “If the pump exceeds the acceptable threshold, it may be an indication that the pump is not working properly and

remedial action should be taken, such as taking the pump offline.” *Id.* (citing Ex. 1001, 10:4–11, 11:11–18).

Patent Owner applies its foregoing claim construction to Norris, arguing Norris’s comparison of “measured rates” with “desired rates” cannot correspond to the claimed detection of a first parameter being outside of an acceptable threshold. *See* Prelim. Resp. 17–18 (citing Ex. 1004 ¶ 37). In particular, according to Patent Owner, “Norris’s system discloses no . . . limit” and it “instead uses increasing and decreasing pump parameters to configure the system to operate at the ‘desired rates.’” Prelim. Resp. 19 (citing Pet. 16–17, 32; Ex. 1004 ¶¶ 35, 37–38).

Patent Owner further asserts Dr. Durham’s declaration testimony “merely parrots” the arguments in the Petition, so it suffers from the same flaws as the Petition, and “provides little to no probative value beyond Petitioner’s attorney argument.” *Id.* at 24–25, 27–28 (discussing Pet. 17; Ex. 1003 ¶¶ 141–144, 162) (citations to PTAB decisions omitted). Patent Owner particularly asserts Dr. Durham “implicitly admits that Norris does not explicitly disclose a ‘threshold’ such as ‘a specific size of “error” to determine when to issue control components,’ as evidenced by his opinion that a [person of ordinary skill in the art] would know to use such ‘threshold[s].’” *Id.* at 28 (citing Ex. 1003 ¶ 143) (footnote omitted). Patent Owner also attacks “the operational-adjustment examples” provided by Dr. Durham, as not corresponding to the claimed detection of a parameter being outside of an acceptable threshold, for essentially the same reasons discussed above in the context of Norris. *See id.* at 25–27 (discussing Ex. 1003 ¶ 141).

Patent Owner finally argues the Petition improperly incorporates the Durham Declaration by reference, thereby circumventing the Board’s word count limitation on petitions, and “the Board should decline to consider the incorporated-by-reference arguments.” *Id.* at 45–46 (citing *Cisco Sys., Inc. v. C-Cation Techs, LLC*, IPR2014-00454, Paper 12 (PTAB Aug. 29, 2014)). In support, Patent Owner cites where “the Petition makes two conclusory statements purporting to show Norris’s disclosure of ‘*acceptable threshold[s]*,’ . . . citing the entire section XI.A.7 of Dr. Durham’s [Declaration].” *Id.* at 46 (citing Pet. 17).

(c) *Analysis and Conclusion*

We conclude the evidence of record supports, sufficiently to justify institution of review, Petitioner’s contention that Norris discloses detecting a first parameter (i.e., the pressure within pressure-side manifold 250b) is outside of an acceptable threshold, for the following reasons.

First, we accept (for purposes of this Decision) Patent Owner’s construction of the claim term “acceptable threshold” as referring to a limit, wherein, when the limit is reached, something happens or changes. *See* Prelim. Resp. 18 (citing Exs. 2002, 2003, and 2004). We find, however, that this is how Norris’s control system operates, based on the present preliminary record. That is, Norris’s application controller 401 monitors the pressure within pressure-side manifold 250b as measured by pressure sensor 185, and compares that measured pressure with a desired pressure. *See* Ex. 1004, Figs. 2, 3A, and 3B, ¶¶ 22, 29–31, 35–37. Then, “*upon variation from the desired settings*,” Norris’s control system increases or decreases the operation of pumps 270 to “*restore the desired pressure*.” *Id.*

at Fig. 2, ¶ 37 (emphasis added). Regardless of whether the desired pressure setting is applied as a single pressure value, or as a range having minimum and maximum pressure values, determining that the measured pressure varies from the desired pressure setting is applying a limit which, when it is reached, changes the operation of pumps 270.

Second, based on the present preliminary record, we reject Patent Owner’s additional claim construction position that the claim term “acceptable” requires that the limit must be an “operational limit” representing a potential failure condition that results in shutting down one or more pumps 270. *See* Prelim. Resp. 19–22 (citing Ex. 1001, 5:65–6:9, 6:56–59, 7:63–66, 8:16–17, 8:25–28, 10:4–11, 11:11–18). It is true that the ’435 patent specification describes such an operational limit as one example of an “acceptable threshold.” *See* Ex. 1001, 5:65–6:6, 6:56–59, 7:63–66, 8:16–17, 8:25–28, 10:4–11, 11:11–18.

However, the ’435 patent specification also describes another example of an “acceptable threshold” as “automatically adjusting” rather than turning off a pump (*id.* at 10:4–11), and indicates the control system may “adjust” the pumps and other system components “so that each is performing its job *most efficiently*.” *Id.* at 5:51–6:9 (emphasis added), 7:41–54, 8:1–9; *see also id.* at 6:40–61 (“Operating efficiencies for each individual component and the system 40 may be greatly improved,” for example “[p]ump efficiencies may be monitored . . . to optimize boost and rate . . . to deliver a consistent job.”). Patent Owner’s claim construction that would limit the scope of the claim term “acceptable threshold” to require applying an operational pump limit, to the exclusion of applying limits that simply optimize efficient pump operation, is contradicted by this intrinsic evidence.

Indeed, claim 10 depends from independent claim 7 (which contains the same “acceptable threshold” limitation as claim 1), to further limit the scope of the claimed invention to “determining that the one or more parameters *are indicative of a potential failure condition.*” *Id.* at 12:63–64 (claim 7), 13:23–25 (claim 10) (emphasis added). Claim differentiation therefore suggests that the independent claims are broader than that.

Finally, Dr. Durham’s declaration testimony supports Petitioner’s contentions, whereas Patent Owner’s opposition is unsupported by witness testimony at this time. *See* Ex. 1003 ¶¶ 141–142, 155–157, 162. As Patent Owner points out, there is a substantial amount of overlap between the Petition as a whole and the Declaration (*see* Prelim. Resp. 24–25, 27–28), which demonstrates that there is no improper incorporation by reference. Concerning Petitioner’s particular citation to “§ XI.A.7” of the Durham Declaration in the Petition (Pet. 17), that section of the declaration comprises just four paragraphs (Ex. 1003 ¶¶ 141–144) spanning two pages, so there is no improper incorporation by reference in that regard.

Thus, based on the present preliminary record, we conclude the evidence sufficiently supports Petitioner’s reliance on Norris as disclosing detecting a first parameter is outside of an acceptable threshold to justify institution of review.

(iii) Conclusion as to Claim 1

For the foregoing reasons, we conclude the record shows a reasonable likelihood that Petitioner would prevail with respect to challenging claim 1 as anticipated by Norris.

3. *Claims 2–5, 7, 13, 14, 16, and 17*

Petitioner provides arguments and evidence in support of contending claims 2–5, 7, 13, 14, 16, and 17 are unpatentable as anticipated by Norris. *See* Pet. 26–31; Ex. 1003 ¶¶ 196–266 (addressing Grounds One and Two together). Patent Owner does not address these contentions apart from arguments we have considered above in connection with claim 1.

“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). Thus, pursuant to USPTO rules and policy implementing *SAS*, *supra*, we “either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”), 5–6, 64.¹⁰ We “will not institute on fewer than all claims or all challenges in a petition.” *Id.* at 5, 64; *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (stating a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Thus, because we have decided to grant institution on the anticipation challenge to claim 1 based on Norris, we do the same for claims 2–5, 7, 13, 14, 16, and 17. *See supra* Section IV.F.2; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Furthermore, Patent Owner does not address these other claims in Ground One apart from arguments we have considered above in relation to

¹⁰ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

claim 1, so there is nothing further for us to address with respect to Ground One at this time. *See* CTPG 5–6, 64.

G. Ground Two — Alleged Obviousness over Norris

In Ground Two, Petitioner asserts claims 1–5, 7, 13, 14, 16, and 17 of the ’435 patent are unpatentable as having been obvious over Norris. *See* Pet. 6, 31–32. Patent Owner opposes, relying on arguments discussed above in relation to Ground One. *See, e.g.,* Prelim. Resp. 22–23.

As discussed above, because we have decided to grant institution with respect to Ground One, we do the same for Ground Two. *See supra* Section IV.F.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Furthermore, because Patent Owner does not provide any additional arguments against Ground Two, there is nothing further for us to address with respect to Ground Two at this time. *See* CTPG 5–6, 64.

We nonetheless note Petitioner’s assertion in its Preliminary Reply that the Petition’s “explanation is clear that a threshold comparison — an elementary feature in control systems — is both disclosed in *and obvious over* Norris.” Prelim. Reply 3 (emphasis added) (citing Pet. 16–17; Ex. 1003 ¶¶ 141–44, 178–80). We disagree. Based on the present record, we conclude Ground Two as articulated in the Petition does not address the obviousness of “detect[ing] that the first parameter is outside of an acceptable threshold” per claim 1. *See* Pet. 31–32 (Ground Two addresses only element 1[e][i] of claim 1); Ex. 1014, 1 (identifying elements 1[e][i] and 1[e][ii] of claim 1). Although Dr. Durham’s Declaration posits that “it would have been obvious to a [person of ordinary skill in the art] to use a ‘threshold’, such as a specific size of ‘error’” in Norris if that is not

expressly disclosed (Ex. 1003 ¶ 143), the Petition does not rely on that testimony for obviousness in Ground Two (*see* Pet. 31–32).

H. Ground Three — Alleged Obviousness over Norris and Omont

In Ground Three, Petitioner asserts claims 1–7 and 10–17 of the ’435 patent are unpatentable as having been obvious over Norris and Omont. *See* Pet. 6, 33–59. Patent Owner disagrees. *See* Prelim. Resp. 10–12, 28–42.

As discussed above, because we have decided to grant institution with respect to Ground One, we do the same for Ground Three. *See supra* Section III.F.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Nonetheless, we will address Patent Owner’s arguments concerning Ground Three separately from Ground One, to provide guidance to the parties for the upcoming trial. *See* CTPG 6, 64.

Patent Owner argues Petitioner’s reliance on Omont as disclosing the “processing devices” limitation of claim 1 (Ex. 1001, 12:8–18), set forth in Petitioner’s two Examples 3A and 3B, is not supported by the evidence. *See* Prelim. Resp. 28–42. We summarize the disclosure of Omont, then we discuss Petitioner’s two Examples and Patent Owner’s opposition.

I. Omont

Omont is directed to a monitoring system for an oilfield additive system that injects substances into a wellbore. *See* Ex. 1005, code (57).

Figure 1 illustrates additive system 100, including: containers 110 for storing water; container 112 for storing an additive such as a gelling agent; container 130 for storing another additive such as a proppant; mixers 108 and 128 for mixing those materials to form a fracturing fluid; and common

manifold 142 and multiple pump assemblies 150 for injecting the fracturing fluid into wellbore 104 to perform a fracturing operation. *See id.* ¶¶ 17–18, 20–21, 23, 28. Control center 170 monitors and controls the various components of additive system 100 during operation, utilizing a local communication network (not shown in Figure 1). *See id.* ¶ 26.

Figure 2 of Omont is reproduced below.

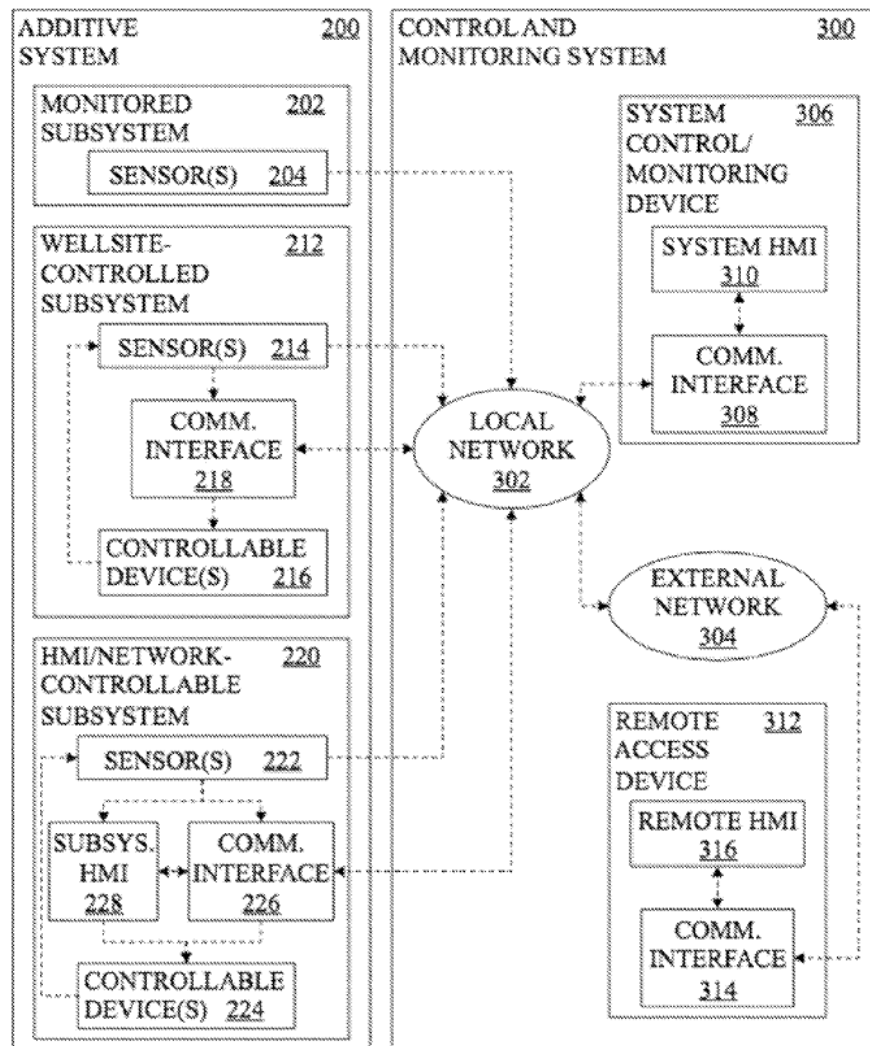


FIG. 2

Omout, Figure 2.

Figure 2 is a schematic view of additive system 100/200 (at left in Figure 2) being controlled by a control and monitoring (CAM) system 300 (at right in

Figure 2) utilizing local network 302. *See id.* ¶¶ 29–31. In particular, system control / monitoring (SCM) device 306 of CAM system 300 performs the control and monitoring functions of CAM system 300. *See id.* ¶¶ 38–40.

As illustrated in Figure 2, the various components of additive system 100/200 (e.g., containers 110, 112, and 130; mixers 108 and 128; common manifold 142; and pumps 152) each appear as a subsystem 202, 212, or 220. *See id.* ¶¶ 29–33, 35–37. Monitored subsystems 202 include sensors 204 monitored by SCM device 306, but no devices that are controlled by SCM device 306. *See id.* ¶ 30. Wellsite-controlled subsystems 212 include sensors 214 monitored by SCM device 306, as well as controllable devices 216 controlled by SCM device 306. *See id.* ¶¶ 32–33. HMI/network-controllable (HNC) subsystems 220 include sensors 222 monitored by SCM device 306, controllable devices 224 controlled by SCM device 306, as well as HMI subsystem 228 which permits a human operator to control HNC subsystem 220. *See id.* ¶¶ 35–37.

2. *Petitioner’s Example 3A*

In Example 3A, Petitioner argues the claimed “second device” corresponds to Omont’s SCM device 306, which generates automated control instructions utilizing data from sensors 204, 214, and 222. *See* Pet. 47–49 (citing Ex. 1005, Figs. 1–3, ¶¶ 30–35, 37–38, 59, 61–63; Ex. 1003 ¶¶ 287–298). In support, Petitioner asserts Omont’s SCM device 306 “is ‘of the plurality of pumps, the distribution system, or the wellhead’” as specified in claim 1, because SCM device 306 “controls and

monitors pump and distribution system operations.” *Id.* at 48–49 (citing Ex. 1005, Fig. 3, ¶¶ 38, 50–52).

Patent Owner responds that Omont’s SCM device 306 cannot be the “second device” of claim 1, because it is not a “device *of* the plurality of pumps, the distribution system, or the wellhead” as recited in claim 1. Ex. 1001, 12:12–14 (emphasis added); Prelim. Resp. 28–29, 32. In particular, Patent Owner asserts Omont fails to “disclose or suggest that the SCM device 306 is *part of* the pumping system, distribution system, or wellhead.” *Id.* at 32 (emphasis added). Indeed, according to Patent Owner, Omont makes clear that SCM device 306 instead is “a separate system” from Omont’s pump assemblies 150, common manifold 142, discharge line 148, and wellhead, which communicate with each other over local network 302. *Id.* at 32–38 (citing Ex. 1005, Figs. 1 and 2, ¶¶ 17, 23, 26, 29, 37–39).

Patent Owner further asserts this distinction is supported by the prosecution history of the ’435 patent, during which Patent Owner successfully amended claim 1 to overcome an obviousness rejection based in part on Omont-842¹¹, which contains the same disclosure as Omont. *See* Prelim Resp. 5–6, 28–31, 37–38 (citing Ex. 1002, 968–70, 991, 998–99, 1131, 1317).

We agree with Patent Owner’s argument, based on the present preliminary record. Petitioner’s assertion that Omont’s SCM device 306 is a device “of” Omont’s pump assemblies 150, Omont’s distribution system 142, or wellhead per claim 1 (Ex. 1001, 12:12–14) because SCM device 306 monitors and controls those subsystems effectively reads this

¹¹ Ex. 2001 (U.S. Patent App. Pub. No. 2017/0226842 A1).

requirement out of claim 1. In particular, Omont's Figure 2 demonstrates that SCM device 306 is a separate device from each subsystem 202, 212, and 220 of additive system 200. SCM device 306 is located in the box that defines CAM system 300 rather than the boxes defining subsystems 202, 212, and 220. Further, SCM device 306 communicates with those subsystems via local network 302, again demonstrating the separateness of SCM device 306 from those subsystems. We conclude SCM device 306 is a device "of" CAM system 300, and not a device "of" subsystems 202, 212, or 220 in additive system 200. Accepting Petitioner's contrary mapping would mean that SCM device 306 is a device "of" every subsystem 212 and 220 that is controlled by SCM device 306, which does not make sense.

Moreover, we also presently are persuaded by Patent Owner's reliance on the prosecution history of the '435 patent as underscoring the significance of the separateness of SCM device 306 from subsystems 202, 212, and 220. Omont (cited in the Petition) and Omont-842 (at issue during the prosecution history) contain substantially identical disclosures. Omont is the WIPO publication of an international application, and Omont-842 is the USPTO publication of the national stage entry of the same application in the United States. *See* Ex. 1005, codes (19) and (21); Ex. 2001, codes (19) and (86).

During prosecution, the Examiner rejected claims 1 and 7 under 35 U.S.C. § 103 as being unpatentable over Omont-842 and Devine. *See* Ex. 1002, 1130–31, 1133–34. The Examiner found Omont-842 discloses "a plurality of sensing devices 214, 222 configured to measure one or more parameters of the plurality of pumps and the distribution system," as well as "one or more processing devices 306 configured to receive the one or more parameters and detect that a first parameter of the one or more parameters is

outside of an acceptable threshold.” *Id.* at 1130–31 (citations omitted). The Examiner also rejected claim 7’s dependent claim 21 under 35 U.S.C. § 112 as being incomplete (*see id.* at 1129), but indicated claim 21 would be allowable if rewritten to overcome the § 112 rejection (*see id.* at 1140). The Examiner’s stated reason for that indication was: “The prior art of record fails to disclose or suggest transmitting a first parameter from a first device of a plurality of pumps, a distribution system, or wellhead to a second [device] of a plurality of pumps, a distribution system, or wellhead.” *Id.*; *see also id.* at 1317 (listing claim 21).

In response, Patent Owner amended claim 1 as follows:

1. A hydraulic fracturing system, comprising:

a plurality of pumps positioned at a wellsite and configured to pressurize a fracturing fluid;

a distribution system fluidly coupled to receive and consolidate fracturing fluid from the plurality of pumps for injection into a wellhead; and

a control system comprising:

a plurality of sensing devices configured to measure one or more parameters of the plurality of pumps and the distribution system;

one or more processing devices configured to receive ~~and the one or more parameters~~ a first parameter from a first device of the plurality of pumps, the distribution system, or the wellhead, and transmit the first parameter to a second device of the plurality of the plurality of pumps, the distribution system, or the wellhead, and detect that ~~[[a]] the first parameter of the one or more parameters~~ is outside of an acceptable threshold; and generate automated control instructions at the second device based at least in part on the first parameter ~~one or more parameters~~; and

one or more control devices configured to receive the automated control instructions and automatically adjust one or more aspects of the second device ~~the plurality of pumps or the distribution system~~ based on the control instructions.

Id. at 991. Patent Owner similarly amended claim 7 (*see id.* at 993) and argued these amendments incorporated the allowable subject matter of claim 21 into claims 1 and 7 and overcame the § 112 rejection (*see id.* at 998–99).

The Examiner agreed with Patent Owner and allowed claims 1 and 7, repeating the reasons for allowance quoted above. *See id.* at 968, 969–70. Claims 1 and 7 later issued in the '435 patent without further amendment or comment.

Thus, Petitioner's reliance on Omont in Example 3A is inconsistent with the Examiner's stated reason for allowing claims 1 and 7 over Omont-842. We are not bound by that statement in this proceeding, but as discussed above we nonetheless agree with it based on the record presented. For example, Petitioner's summary of the prosecution history (*see* Pet. 3–4) and terse argument concerning Omont in this regard (*see id.* at 48) does not persuade us that the Examiner may have erred.

3. *Petitioner's Example 3B*

In Example 3B, Petitioner argues Omont's sensors 204, 214, and 222 correspond to the “first device” of claim 1, and Omont's subsystems 212 and 220 correspond to the “second device” of claim 1.¹² *See* Pet. 49–50

¹² Petitioner additionally refers to Omont's Figure 3 illustrating various sensors and subsystems 242, 252, and 262. *See* Pet. 50. However, we agree

(citing Ex. 1005, Fig. 2, ¶¶ 61–63; Ex. 1003 ¶¶ 285–298). In particular, according to Petitioner, Omont’s subsystems 212 and 220 “receive a first parameter from one or more sensors” and “have ‘portions’ implemented as ‘control hardware’ that ‘receive[s] information generated by the sensors.’” *Id.* at 50–51 (citing Ex. 1005, Fig. 2, ¶¶ 60–67, 137–145). Petitioner further asserts subsystems 212 and 220 “are ‘of the plurality of pumps, the distribution system, or the wellhead’: the subsystems contain (and may be) the pumps, the distribution system, the wellhead, or components thereof.” *Id.* at 50 (citing Ex. 1005, Fig. 1, ¶¶ 18, 21, 33, 37).

Patent Owner responds that Petitioner’s Example 3B mapping fails to establish Omont discloses or suggests, per claim 1, transmitting a first parameter from a first device to a second device. *See* Prelim. Resp. 28–29, 39. According to Patent Owner, “[s]ensors 214 are *part of the same device* (i.e., Wellsite-Controlled Subsystem 212)” such that Petitioner’s Example 3B mapping “fails because a device transmitting to itself does not meet the requirement to ‘*transmit the first parameter from a first device*’ ‘*to a second device.*’” *Id.* at 39–41 (citing Ex. 1005, Fig. 2, ¶ 33). The same holds true for sensors 222 and subsystem 220, according to Patent Owner. *See id.* (citing Ex. 1005, Fig. 2, ¶ 35). Patent Owner concludes “[t]he Petition’s mapping improperly maps claimed different devices to non-separated structures,” whereas the language of claim 1 requires the first and second devices to be separate structures. *Id.* at 41–42 (citing *HTC Corp.*

with Patent Owner’s argument that Petitioner does not explain persuasively how those subsystems are “of” Omont’s pumps, distribution system, or wellhead, per claim 1. *See* Pet. 49–51; Prelim. Resp. 39 n.7.

v. Cellular Commc'ns Equip., LLC, 701 F. App'x 978, 982 (Fed. Cir. 2017)).

We disagree with Patent Owner's opposition, on the present preliminary record. The Petition does refer at times to Omont's subsystems 212 and 220 (generically) as the second device of claim 1. *See* Pet. 49–50. However, the Petition also discusses how those subsystems contain “control hardware” (specifically) that receives information generated by the sensors. *See id.* at 41, 50 (citing Ex. 1005, Figs. 2–3, ¶¶ 60–65). Omont correspondingly describes how the control hardware comprises one or more computing devices that “may receive information generated by the sensors 204, 214, 222.” Ex. 1005 ¶¶ 60, 62–63, 65. Thus, taking the control hardware of Omont's subsystems 212 and 220 as the second device of claim 1, Patent Owner's objection concerning a device being unable to transmit information to itself is unavailing.

4. *Incorporation by Reference*

Patent Owner finally argues the Petition improperly incorporates the Durham Declaration by reference, thereby circumventing the Board's word count limitation on petitions. *See* Prelim. Resp. 45–46 (citing *Cisco Sys., supra*). In support, Patent Owner cites the Petition's “sentence that ‘[b]oth the SCM and control hardware in Omont generate automated control instructions based on the first parameter,’” which Patent Owner asserts “provides no meaningful discussion of how the SCM Device generates control instructions at the second device or how the control hardware generates instructions based on the first parameter, but instead cites the entire section XII.B.6 of Dr. Durham's report.” *Id.* at 46–47 (citing

Pet. 45–46). Patent Owner further objects to Petitioner’s Example 3A analysis as “provid[ing] no discussion or explanation of how Omont’s SCM device is the claimed ‘*second device*,’” and to Petitioner’s Example 3B analysis as “includ[ing] no meaningful discussion of how Omont’s control hardware generates instructions using the first parameter, which must be from the first device instead of the second device.” *Id.* at 47.

We do not discern an incorporation by reference problem for Petitioner, based on the present record. We conclude there is a substantial amount of overlap between the Petition as a whole and the Durham Declaration concerning the mapping of element 1[e] to Omont, and the explanatory detail in the Durham Declaration that is not repeated in the Petition is not excessive. *See* Pet. 42–46, 47–51; Ex. 1003 ¶¶ 293–305. Concerning Petitioner’s particular citation to “§ XII.B.6” of the Durham Declaration in the Petition (Pet. 45–46), that section of the declaration comprises just four paragraphs (Ex. 1003 ¶¶ 302–305) spanning two pages, so there is no improper incorporation by reference in that regard.

I. Ground Four — Alleged Obviousness over Norris and Borgstadt

In Ground Four, Petitioner asserts claims 1–5 and 7–19 of the ’435 patent are unpatentable as having been obvious over Norris and Borgstadt. *See* Pet. 6, 59–78. Patent Owner disagrees. *See* Prelim. Resp. 12–14, 42–45.

As discussed above, because we have decided to grant institution with respect to Ground One, we do the same for Ground Four. *See supra* Section III.F.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Nonetheless, we will address Patent Owner’s arguments concerning Ground Four separately from

Ground One, to provide guidance to the parties for the upcoming trial. *See* CTPG 6, 64.

Patent Owner argues Petitioner’s reliance on Borgstadt as disclosing the “first parameter” of claim 1 overlooks the “four different requirements” specified in claim 1 for the first parameter: (1) it must be received from a first device; (2) it must be transmitted to a second device; (3) it must be detected to be outside of an acceptable threshold; and (4) it must be utilized to generate automated control instructions. Prelim Resp. 42. Patent Owner asserts Ground Four improperly “maps *different* parameters in Borgstadt to satisfy the above limitations.” *Id.* at 43 (emphasis added).

In particular, according to Patent Owner, the Petition cites Borgstadt’s “pump’s efficiency value” as the first parameter for limitation (3), and cites Borgstadt’s “measured parameters” as the first parameter for limitations (1) and (4). *Id.* at 43–44 (citing Pet. 67–69). Patent Owner concludes “the Petition mapped different parameters to the claimed ‘*first parameter*’ to satisfy different limitations, and never reconciles how these *different* parameters satisfy the *same* parameter” in the claim. *Id.* at 44. Patent Owner further contends “Borgstadt confirms that measured parameters and current efficiency values are distinct and separate parameters” and “refers to each parameter as having different uses in the prior art.” *Id.* at 45 (citing Ex. 1006 ¶¶ 24–25, 33, 36).

Petitioner replies that Patent Owner “misreads the Petition,” because it argues Borgstadt teaches use of a pump’s current efficiency value “*or ‘other pump parameters.’*” Prelim. Reply 4 (citing Pet. 66). Patent Owner responds that even if the Petition makes that argument (which Patent Owner

does not concede), “these other pump parameters are not the same parameter used in a comparison in” limitation (3). Prelim. Sur-reply 4.

We agree with Patent Owner’s reading of claim 1 as requiring that the *same* parameter must satisfy all of the specified requirements for the first parameter. However, based on the present preliminary record, we find the Petition cites Borgstadt’s *pump efficiency* parameter as satisfying all of the specified requirements for the first parameter, as follows.

When addressing the limitations that require *receiving and transmitting a first parameter*, Petitioner maps the first parameter to Borgstadt’s “output 118 parameters of each pump unit 110,” which “include, but are not limited to, the output pressure, output flow rate, *and output efficiency* of the pump unit 110.” Ex. 1006, Fig. 1, ¶ 25 (emphasis added); *see* Pet. 66 (referring to Borgstadt’s “pump modulator ‘receiv[ing] a pump unit’s *current efficiency value*,” (emphasis added)); *see also id.* at 68 (referring to “a ‘measured parameter . . . of the pump unit 110, for example output pressure 132 or output flow rate” (citing Ex. 1006, Fig. 1, ¶ 24)). Borgstadt’s Figure 1 correspondingly illustrates that pump controller 108 measures output parameters 118 of pump unit 110, including output flow rate 130, output pressure 132, and output efficiency 134. Ex. 1006, Fig. 1, ¶ 23.

Then, addressing the limitation of *detecting that the first parameter is outside of an acceptable threshold*, Petitioner argues “Borgstadt teaches

comparing measured parameters to a threshold,” and cites output efficiency 134 as an example. Pet. 67, 69 (citing Ex. 1006, Fig. 2, ¶ 33).¹³

Next, addressing the limitation of *generating automated control instructions based on the first parameter*, Petitioner again refers to “Borgstadt’s teaching of monitoring pump efficiency” and also more generically to Borgstadt’s “different measured parameters.” *See id.* at 67–68, 69 (citing Ex. 1006, Fig. 1, ¶¶ 10, 22–26). Thus, a common theme that runs throughout Petitioner’s assertions in Ground Four is that Borgstadt’s usage of at least its pump output efficiency 134 parameter (specifically) satisfies all of the limitations of claim 1.

We finally acknowledge that, as part of summarizing Borgstadt’s disclosure, Patent Owner concludes that “*as explained further below*, Borgstadt does not disclose or render obvious” several aspects of claim 1. Prelim. Resp. 12–14 (emphasis added). However, Patent Owner’s subsequent analysis of Ground Four does not return to this argument, except as we have already discussed above. *See id.* at 42–45. Therefore, we do not consider this argument in this Decision.

J. Ground Five — Alleged Obviousness over Norris and Dykstra

In Ground Five, Petitioner asserts claims 1–7 and 13–17 of the ’435 patent are unpatentable as having been obvious over Norris and

¹³ Patent Owner objects to the Petition’s reference to Omont at page 69 (“a POSITA would have combined *Omont* and *Norris* to compare operational parameters to thresholds throughout the fracturing system”). *See* Prelim Resp. 43 n.9. Based on the present record, we conclude the reference there to “*Omont*” is a typographical error that should have been “*Borgstadt*” as applicable to Ground Four. *See, e.g.*, Pet. 48, 50 (corresponding portions of Ground Three).

Dykstra. *See* Pet. 6, 79–83. Patent Owner opposes, relying on arguments discussed above in relation to Ground One. *See, e.g.*, Prelim. Resp. 22–23.

As discussed above, because we have decided to grant institution with respect to Ground One, we do the same for Ground Five. *See supra* Section III.F.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Furthermore, because Patent Owner does not provide any additional arguments against Ground Five, there is nothing further for us to address with respect to Ground Five at this time. *See* CTPG 5–6, 64.

V. CONCLUSION

For the above reasons, we determine the information in the record shows a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. We, therefore, institute the petitioned *inter partes* review. *See* 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(a).

At this preliminary stage, the Board has not made a final determination with respect to the patentability of the challenged claims or any underlying factual or legal issue. The Board’s final determination will be based on the record as developed during the *inter partes* review. Any arguments not raised by Patent Owner in a timely-filed response may be deemed waived.

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–19 of the ’435 patent on all challenges presented in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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