

CONFIDENTIAL NON-PUBLIC VERSION

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BERKSHIRE HATHAWAY ENERGY COMPANY,
MIDAMERICAN ENERGY COMPANY, PACIFICORP, and
WEC ENERGY GROUP, INC.,
Petitioners,

v.

BIRCHTECH CORP.,
Patent Owner.

IPR2025-00423
Patent 10,668,430 B2

Before KRISTINA M. KALAN, ZHENYU YANG, and
AVELYN M. ROSS, *Administrative Patent Judges*.

YANG, *Administrative Patent Judge*.

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

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I. INTRODUCTION

Berkshire Hathaway Energy Company (“Berkshire”), Interstate Power & Light Company (“IPL”), MidAmerican Energy Company (“MidAmerican”), PacifiCorp, WEC Energy Group, Inc. (“WEC”), and Wisconsin Power & Light Company (“WPL”) (collectively, “Petitioners”)¹ filed a Petition (Paper 1, “Pet.”), seeking *inter partes* review of claims 1–4 and 6–29 of U.S. Patent No. 10,668,430 B2 (Ex. 1001, “the ’430 patent”). Birchtech Corp. (“Patent Owner”), formerly known as Midwest Energy Emissions Corp. (“ME2C”) (Paper 9, 1²), filed a Preliminary Response. Paper 19 (“Prelim. Resp.”).³ With our authorization (Ex. 3001), Petitioners filed a Reply to the Preliminary Response (Paper 22, “Reply”), and Patent Owner filed a Sur-reply to Petitioners’ Reply (Paper 24, “Sur-reply”).

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

¹ IPL and WPL subsequently settled their dispute with Patent Owner and have been terminated from this proceeding. Paper 29. Accordingly, “Petitioners” as used herein refers only to the remaining Petitioners, namely, Berkshire, MidAmerican, PacifiCorp, and WEC.

² All but the cover page of Paper 9 are numbered “Page 2.” We consider the first page after the cover page as page number 1.

³ Patent Owner and Petitioners also filed briefs, arguing for and against discretionary denial, respectively. Papers 16, 20. The Acting Director determined that discretionary denial was not appropriate and referred the Petition to the Board. Paper 21.

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For the reasons provided below, we determine Petitioners have satisfied the threshold requirement set forth in 35 U.S.C. § 314(a). We institute *inter partes* review of all challenged claims based on all the grounds raised in the Petition.

A. Real Parties in Interest

Petitioners identify Berkshire, IPL, MidAmerican, PacifiCorp, WEC, and WPL, as well as Alliant Energy Corporation, Alliant Energy Corporate Services, Inc., MidAmerican Funding, LLC, MHC Inc., PPW Holdings LLC, Madison Gas and Electric Company, and Wisconsin Public Service Corporation as real parties in interest. Pet. 1–2.

Patent Owner identifies “MES, Inc.” as the real party in interest. Paper 9, 1.

B. Related Matters

Petitioners filed a concurrent petition (IPR2025-00422), seeking *inter partes* review of the same claims challenged in this proceeding.⁴ Pet. 3.

The parties identify the following matters as related to this proceeding:

⁴ Petitioners filed an explanation regarding the necessity of multiple petitions. Paper 2. Patent Owner does not challenge that multiple petitions are necessary. *See generally* Prelim. Resp. In any event, whether to deny institution because a petitioner filed multiple petitions is best raised and resolved through the process involving a bifurcated procedure for considering discretionary issues. *See* USPTO Memorandum, Interim Process for PTAB Workload Management (March 26, 2025), *available at* <https://uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf>.

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Midwest Energy Emissions Corp. et al. v. Arthur J. Gallagher & Co. et al., No. 1:19-cv-01334 (D. Del.) (“the Delaware Action”);

Midwest Energy Emissions Corp. v. Tucson Electric Power Co. et al., No. 3:24-cv-08145 (D. Ariz.);

Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Co. et al., No. 4:24-cv-00248 (S.D. Iowa);

Midwest Energy Emissions Corp. v. Ameren Corporation et al., No. 4-24-cv-00980 (E.D. Mo.);

In re Midwest Energy Emissions Corp. Patent Litigation, No. 4:24-md-3132 (S.D. Iowa) (consolidating the Iowa, Arizona, and Missouri cases);

Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company et al., No. 2-25-cv-00015 (D. Wy.);

Midwest Energy Emissions Corp. v. Wisconsin Power and Light Company, No. 3-25-cv-00026 (W.D. Wis.);

Midwest Energy Emissions Corp. v. MidAmerican Energy Company et al., Case No. 4-24-cv-00243 (S.D. Iowa); and

Birchtech Corp. f/k/a Midwest Energy Emissions Corp. v. Evergy, Inc. et al., Case No. 4-25-cv-00050 (W.D. Mo.).

Pet. 5–6; Paper 9, 1–2.

Petitioners previously filed other petitions for *inter partes* review, challenging two other patents owned by Patent Owner. Pet. 3. Those petitions are: IPR2025-00274 and IPR2025-00278, challenging claims of U.S. Patent No. 10,343,114 (“the ’114 patent”); and IPR2025-00280 and

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IPR2025-00281, challenging claims of U.S. Patent No. 10,596,517. *Id.* The Board instituted trial in those proceedings.

Petitioners also bring to our attention several *inter partes* review proceedings, with petitions filed by other entities, including IPR2020-00832 and IPR2020-00834, challenging claims of the '114 patent; and IPR2020-00926 and IPR2020-00928, challenging claims of a parent patent of the '430 patent. Pet. 3–5. According to Petitioners, the Board granted institution but terminated those proceedings because the parties settled. *Id.*

C. The '430 Patent

The '430 patent “relates to methods and materials for the removal of pollutants from flue gas or product gas from a gasification system. In particular, mercury is removed from gas streams generated during the burning or gasification of fossil fuels by highly reactive regenerable sorbents.” Ex. 1001, 1:40–44.

The '430 patent states that

[t]he combustion and gasification of fossil fuel such as coal generates flue gas that contains mercury and other trace elements that originate from the fuel. The release of the mercury (and other pollutants) to the environment must be controlled by use of sorbents, scrubbers, filters, precipitators, and other removal technologies.

Id. at 1:46–51.

The '430 patent acknowledges that “[s]everal types of mercury control methods for flue gas have been investigated, including injection of fine sorbent particles into a flue gas duct and passing the flue gas through a sorbent bed.” *Id.* at 2:2–5. According to the '430 patent, however, because sorbents in the existing carbon injection systems are initially unreactive, they

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“must be used in large amounts, at high sorbent-to-mercury ratios, to effectively capture the mercury.” *Id.* at 2:23–29. Thus, “there remains a need for more economical and effective mercury removal technology.” *Id.* at 2:35–36.

The ’430 patent describes a halogen/halide promoted activated carbon sorbent that is highly effective for the removal of mercury from flue gas streams. *Id.* at 2:48–50. According to the ’430 patent, “[t]he sorbent comprises a new halide-modified carbon form containing a reactive compound produced by the reaction of bromine (or halide or other halogen) with the carbon.” *Id.* at 2:50–53.

The ’430 patent states that “[o]ptional secondary components and alkali may be added to further increase reactivity and mercury capacity,” and discloses that “the optional secondary component is selected from the group consisting of Group V halides, Group VI halides, HI, HBr, HCl, and combinations thereof.” *Id.* at 2:53–55, 3:32–35.

The ’430 patent provides a promoted carbon sorbent “comprising a base activated carbon that has reacted with a promoter selected from the group consisting of halides, halogens, and combinations thereof.” *Id.* at 2:62–65. In one embodiment, “the promoter is selected from the group consisting of Br₂, a Group V bromide, a Group VI bromide, and combinations thereof.” *Id.* at 4:3–5.

The ’430 patent states that its invention “provides for cost-effective removal of pollutants including mercury, using sorbent enhancement additives and/or highly reactive sorbents, with contact times of seconds (or less), and that may be regenerated and reused.” *Id.* at 2:37–40.

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D. Illustrative Claim

Independent claim 1 is illustrative of the claimed subject matter and is reproduced below.

1. A method of separating mercury from a mercury-containing gas, the method comprising:

combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein

the coal comprises an additive comprising Br₂, HBr, a bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber, or

the combustion chamber comprises an additive comprising Br₂, HBr, a bromide compound, or a combination thereof or a combination thereof;

injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;

contacting mercury in the mercury-containing gas with the sorbent; and

separating the sorbent contacted with the mercury from the mercury-containing gas.

Ex. 1001, 35:47–65.

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E. Asserted Challenges to Patentability

Petitioners assert the following challenges to patentability:

Claims Challenged	35 U.S.C. §	Reference
1–4, 6–29	103	Sjostrom, ⁵ Eckberg ⁶
1–4, 6–29	103	Sjostrom, Olson-646 ⁷
1, 3, 6, 7, 10–29	102(a)(1)	Olson-235 ⁸

In support of the unpatentability challenges, Petitioners rely on the Declaration of Stephen Niksa, Ph.D. (Ex. 1002).

II. WHETHER THE PETITION IS TIME-BARRED

Under 35 U.S.C. § 312(a)(2), we consider a petition only if it identifies all real parties in interest. In addition, “[a]n inter partes review may not be instituted if the petition requesting the proceeding is filed more than 1 year after the date on which the petitioner, real party in interest, or privy of the petitioner is served with a complaint alleging infringement of the patent.” 35 U.S.C. § 315(b). Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b). *See, e.g., Ventex Co.*,

⁵ Sjostrom, Sharon, *Full Scale Evaluations of Mercury Control Technologies with PRB Coals*, Track A, Session A3 (Mercury – Control), Presentation A3b, EUEC: 8TH ELECTRIC UTILITIES ENVIRONMENTAL CONFERENCE (Tucson, Arizona: January 25, 2005), Ex. 1010 (“Sjostrom”).

⁶ Eckberg, Craig, et al., *Mercury Control Evaluation of Halogen Injection into a Texas Lignite-Fired Boiler*, Track A, Session A3 (Mercury – Control), Presentation A3c, EUEC: 8TH ELECTRIC UTILITIES ENVIRONMENTAL CONFERENCE (Tucson, Arizona: January 25, 2005), Ex. 1011 (“Eckberg”).

⁷ US 2006/0048646 A1, published Mar. 9, 2006, Ex. 1012 (“Olson-646”).

⁸ US 8,652,235 B2, issued Feb. 18, 2014, Ex. 1018 (“Olson-235”).

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Ltd. v. Columbia Sportswear N. Am., Inc., IPR2017-00651, Paper 152
(PTAB Jan. 24, 2019) (precedential).

Whether an unnamed party is a real party in interest or a privy of the instant petitioner is highly fact dependent and “demands a flexible approach that takes into account both equitable and practical considerations.” *See Applications in Internet Time, LLC v. RPX Corp.*, 897 F.3d 1336, 1351, 1360 (Fed. Cir. 2018) (“AIT”); *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 152 at 4–5 (PTAB Jan. 24, 2019) (precedential) (citing *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018)); Consolidated Trial Practice Guide (“CTPG”) 13 (2019), available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

“Courts invoke the terms ‘real party-in-interest’ and ‘privy’ to describe relationships and considerations sufficient to justify applying conventional principles of estoppel and preclusion.” CTPG 13. These requirements are designed to “protect patent owners from harassment via successive petitions by the same or related parties, to prevent parties from having a ‘second bite at the apple,’ and to protect the integrity of both the USPTO and federal courts by assuring that all issues are promptly raised and vetted.” *Id.* at 12–13. Factors to consider in determining whether a sufficient relationship exists include

- (1) an agreement to be bound; (2) pre-existing substantive legal relationships between the person to be bound and a party to the judgment (e.g., “preceding and succeeding owners of property”); (3) adequate representation by someone with the same interests who was a party (e.g., “class actions” and “suits brought by trustees, guardians, and other fiduciaries”); (4) assumption of control over the litigation in which the judgment was rendered; (5) where the nonparty to an earlier

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litigation acts as a proxy for the named party to relitigate the same issues; and (6) a special statutory scheme expressly foreclosing successive litigation by nonlitigants.

WesternGeco LLC v. ION Geophysical Corp., 889 F.3d 1308, 1319 (Fed. Cir. 2018); *Taylor v. Sturgell*, 553 U.S. 880, 894–95 (2008); *AIT*, 897 F.3d at 1351.

The mere existence of some relationship between a petitioner and another entity, however, is not sufficient to place that petitioner in privity with that entity. *Google LLC v. DDC Technology, LLC*, IPR2023-00707, Paper 27 at 37 (PTAB Oct. 25, 2023). Instead, that relationship must be related to an earlier lawsuit and be “sufficiently close that it can be fairly said the petitioner had a full and fair opportunity to litigate the validity of the patent in that lawsuit” or the evidence must show “that petitioner is simply serving as a proxy to allow another party to litigate the patent validity question that the other party raised in an earlier filed litigation.”

WesternGeco LLC, 889 F.3d at 1319.

Patent Owner argues the Petition is time-barred because it fails to identify Talen and Chem-Mod, who were defendants in the Delaware Action,⁹ as real parties in interest. Prelim. Resp. 29–34. According to Patent Owner, “Petitioners are coal plant owners and/or operators with a close relationship to Delaware Defendants. Consequently, the clock for

⁹ Talen Energy Corporation and Talen Energy Holdings, Inc. (collectively “Talen”) and Chem-Mod LLC (“Chem-Mod”), among others, were named as defendants in the Delaware Action. Ex. 2023.

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time-barring this Petition ran from the time Delaware Defendants were served in the Delaware Litigation.” Sur-reply 1–2.

As explained below, based on the current record, we determine that the Petition is not time-barred for failure to name all real parties in interest.

A. Petitioners who Purchase Coal from Chem-Mod

Patent Owner asserts that Petitioners Berkshire, MidAmerican, IPL, WPL, and WEC (collectively “Chem-Mod Purchasers”) “and their-real parties-in-interest own power plants that used something called ‘the Chem-Mod Solution’ to burn coal.” Prelim. Resp. 31. In the Delaware Action, Patent Owner “asserted that this Chem-Mod Solution caused direct infringement at Petitioners’ power plants” and named Chem-Mod LLC and its various affiliates as defendants. *Id.* at 31–32.

Specifically, Patent Owner contends that “MidAmerican purchased refined coal from Chem-Mod sublicensees” and that Berkshire “owns and controls MidAmerican.” *Id.* at 32–33. Patent Owner alleges that “Wisconsin Public Service Corporation, the parent of Petitioner WEC, purchased refined coal from Chem-Mod LLC sublicensee Arbor Fuels Company, LLC.” *Id.* at 33. Patent Owner states that “[t]hese Petitioners have argued that Chem-Mod and its affiliates defended Patent Owner’s infringement claims and negotiated a license on their behalf.” *Id.* For these reasons, Patent Owner contends that “Chem-Mod and its affiliates are real parties in interest with respect to Petitioners WPL[,] Berkshire Hathaway Energy Company, MidAmerican, IPL, and WEC.” *Id.* at 34. According to Patent Owner, because Chem-Mod was a defendant in the Delaware Action, this Petition is time-barred. *Id.*

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Petitioners argue that neither the fact that “Chem-Mod and its affiliates supplied refined coal to some Petitioners through agreements that expired in 2021,”¹⁰ nor the generic indemnity agreement provided by Chem-Mod to Berkshire, MidAmerican, and WEC, without more, is sufficient to establish Chem-Mod as a real party in interest or create privity. Reply 8–9.

After reviewing the evidence of record, we are persuaded the instant Petition is not time-barred as to the Chem-Mod Purchasers. Generic indemnity agreements are insufficient, without more, to establish privity. *WesternGeco LLC*, 889 F.3d at 1321 (“a contractual and fairly standard customer-manufacturer relationship regarding the accused product” does not suggest, “without more, that the parties were litigating . . . [an] IPR[] as proxies for the other.”).

The only relationship alleged to exist between Chem-Mod, its affiliates, and the Chem-Mod Purchasers is that of a supplier-customer relationship. As part of that relationship, the parties entered into supply agreements that included an indemnification provision for the purchased products. Exs. 2037–2042 (discussed at Sur-reply 7–8).

¹⁰ Petitioners assert that the supply agreements between the Chem-Mod Purchasers and Chem-Mod expired in 2021. For the reasons discussed below, we determine that the language of these agreements does not establish privity. In the event Patent Owner maintains its argument that the Chem-Mod Purchasers are in privity with Chem-Mod, the parties should address the legal impact, if any, of the expiration of these agreements on Patent Owner’s arguments.

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We acknowledge, but disagree with, Patent Owner’s argument that the terms of the indemnity “specifically targeted” the activities at the “heart of the alleged infringement.” Sur-reply 7–8. Rather, the indemnification language in these agreements appears to be standard and typical of supply agreements. *See* Ex. 2037, 26;¹¹ Ex. 2038, 10–12; Ex. 2039, 10–12; Ex. 2040, 10–12; Ex. 2041, 10–12; Ex. 2042, 24–27. Such language, without more, “does not amount to a sufficiently-close relationship to warrant finding . . . privity.” *WesternGeco LLC*, 889 F.3d at 1321–22.

Patent Owner argues that other power plant operators recognized that their supply relationships with Chem-Mod made Chem-Mod a real party of interest in IPR2020-00832. Prelim. Resp. 33–34. This argument is not persuasive because the present inquiry considers the relationship between Chem-Mod and the Chem-Mod Purchasers, not between Chem-Mod and other non-party power plant operators. Moreover, the other power plant operators in IPR2020-00832 identified Chem-Mod only as a “potential” real party in interest (IPR2020-00832, Paper 3, 1–3) and, even if we were inclined to consider Chem-Mod’s relationship with these other power plant

¹¹ Exhibit 2037 is an agreement with WPL, who has recently been terminated from this *inter partes* review. *See* Paper 29. For purposes of this Decision, we have considered whether WPL is in privity with Chem-Mod and/or whether WPL should have named Chem-Mod as a real party in interest. If Patent Owner maintains its position that Chem-Mod should have been named as a real party in interest, the parties should address whether we should consider privity and real party in interest issues with respect to IPL and WPL, who have been terminated from this proceeding.

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operators, the current record contains insufficient evidence for us to determine the nature of such relationship.

Patent Owner asserts that “MidAmerican and WPL own power plants that were at issue in the Delaware Litigation, and they contend that the Chem-Mod-affiliated Defendants defended against Patent Owner’s infringement claims and obtained a license on their behalf, at least for some periods of time.” Sur-reply 4 (citing Ex. 2009, 91; Ex. 2010, 107).

If supported by persuasive evidence, the allegation that Chem-Mod obtained a license on behalf of MidAmerican and WPL could lend some support for Patent Owner’s position. But the evidence Patent Owner cites—two affirmative defenses in Answers to Patent Owner infringement allegation filed by MidAmerican and WPL in district court—is ambiguous at best. In relevant part, the two affirmative defenses state:

FIFTH DEFENSE

ME2C’s claims as to MidAmerican are barred by a covenant not to sue. ME2C entered into a license and covenant not to sue that retroactively and prospectively authorized MidAmerican to practice the asserted claims of the patents-in-suit by covenanting not to sue MidAmerican for any alleged infringement of any claim of any patent-in-suit.

Ex. 2009, 91.

Fifth Defense – License/Release

30. WPL has a license to the Patents-in-Suit and/or has been released from this litigation.

Ex. 2010, 107.

Neither of these affirmative defenses even mentions Chem-Mod, much less provides information sufficient for us to determine that, as Patent

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Owner asserts, Chem-Mod obtained a license on behalf of MidAmerican or WPL.¹² Accordingly, on the current record, Patent Owner’s allegation that Chem-Mod obtained licenses for MidAmerican and WPL does not support Patent Owner’s position that MidAmerican and WPL are in privity with Chem-Mod and/or that MidAmerican and WPL should have named Chem-Mod as a real party in interest.

Patent Owner’s assertion that “MidAmerican and WPL own power plants that were at issue in the Delaware Litigation” (Sur-reply 4) could also lend some support for Patent Owner’s position. But the evidence Patent Owner cites as support (Ex. 2009, 91; Ex. 2010, 107) does not speak to whether MidAmerican and WPL own power plants in Delaware and, if so, what their ownership stake in such plants might be. Moreover, Patent Owner asserts that the power plant operators it sued in 2024—which include MidAmerican and WPL—“are not incorporated in Delaware and thus could not have been included in the Delaware Litigation” (Sur-reply 3), which suggests that their interest in the Delaware power plants at issue in the Delaware Action was not substantial.

Patent Owner does not point to any record evidence that suggests the parties to the Delaware Action adequately represented the Chem-Mod Purchasers’ interests or that the Chem-Mod Purchasers controlled, directed, or funded the Delaware Action. *See generally* Prelim. Resp.; Sur-reply. Nor

¹² Petitioners contend that Patent Owner’s “cited pleadings do not support its ‘on their behalf’ assertions. Rather, certain Petitioners argued that PO cannot pursue infringement claims against them, because PO granted a covenant-not-to-sue.” Reply 6.

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does Patent Owner suggest that the indemnified Petitioners are acting as a proxy for Chem-Mod and its affiliates in this case. Thus, the relationship with Chem-Mod, its affiliates, and the indemnified Petitioners was not “sufficiently close that it can be fairly said petitioner had a full and fair opportunity to litigate the validity of the patent in that lawsuit.” *Google*, IPR2023-00707, Paper 27 at 37.

In sum, Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), but the current record does not provide sufficient reason to doubt Petitioners’ assertion that Chem-Mod was not “funding this petition, advising on strategy for this petition, or exercising any control over Petitioners’ decision to file the petition (or the arguments included therein).” Pet. 2; *see also* Reply 2.

Indeed, the current record supports that the relationship between Chem-Mod and the Chem-Mod Purchasers was a standard supplier/customer relationship. Exs. 2037–2042. The evidence does not support that Chem-Mod negotiated a license on behalf of the Chem-Mod Purchasers or that the Chem-Mod purchasers owned power plants that were at issue in the Delaware Litigation. Ex. 2009, 91; Ex. 2010, 107. Therefore, on this record, we determine that the relationship between Chem-Mod and the Chem-Mod Purchasers does not support that the Petition is time-barred.

B. PacifiCorp

Patent Owner identifies three reasons why it believes Talen is a real party in interest with respect to Petitioner PacifiCorp. Prelim. Resp. 30–31.

First, Patent Owner argues that “Petitioner PacifiCorp is a co-owner of at least one of the Talen power plants accused of infringement in Patent

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Owner ME2C’s Delaware action, *i.e.*, the Colstrip power plant,” and “[a]s the named operator of that power plant, Talen defended the lawsuit and settled the litigation.” *Id.* at 30.

The evidence supports Patent Owner’s argument that PacifiCorp is a co-owner of the Colstrip power plant. Ex. 1113, 1. However, PacifiCorp owns only a 10% interest in contains insufficient evidence for us the Colstrip plant. *Id.* Evidence shows that other owners of the remaining interest are Talen, NorthWestern Energy, Puget Sound Energy, and Portland General Electric. *Id.* Patent Owner does not allege, or identify evidence supporting, that PacifiCorp’s 10% ownership interest gave it any degree of control over Colstrip’s day-to-day operations, or any say in legal proceedings relating to the Colstrip plant. *See generally* Prelim. Resp.; Sur-reply. Without more, we are not persuaded that PacifiCorp’s 10% ownership interest in the Colstrip plant supports Patent Owner’s argument that Colstrip co-owner, Talen, should have been named as a real party in interest.

Second, Patent Owner notes that “PacifiCorp has alleged that Talen negotiated that settlement agreement on its behalf and for the benefit of PacifiCorp.” Prelim. Resp. 31. Here, our analysis is complicated by the fact that the evidence Patent Owner cites in support of its position—PacifiCorp’s answer to the district court infringement suit—is heavily redacted.

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Paragraphs 54–60 of PacifiCorp’s Answer are representative and are reproduced below.

54. As a co-owner of the Colstrip Plant, PacifiCorp is included within the scope of [REDACTED] in the Talen Agreement.

55. PacifiCorp is one of the [REDACTED] in the Talen Agreement.

[REDACTED]
[REDACTED]
□ [REDACTED]
[REDACTED]

57. ME2C had a duty to abide by the terms of the Talen Agreement.

58. ME2C had a duty to not sue or threaten to sue the Talen Released Parties.

59. ME2C had a duty to not identify Talen Released Parties for any purpose as infringing in whole or in part any claim of any Patent-in-Suit.

60. By filing the instant suit against PacifiCorp, ME2C breached and/or violated its

[REDACTED] the Talen Released Parties in Section 2.2 of the Talen Agreement. See Exhibit 1 at Section 2.2.

Ex. 2008, 99.

On the current record, we can only speculate as to the nature of the redacted material. We have reviewed the portions of PacifiCorp’s answer cited by Patent Owner and cannot determine, for example, whether PacifiCorp is one of the Talen Released Parties or, if so, what the nature of the release is. *Id.*; see also *id.* at 95–100. Patent Owner, as a party to the Talen Agreement (*id.* at 95), presumably has this information in its possession. And, having filed suit against PacifiCorp for infringement of the ’430 patent (Ex. 2007), Patent Owner must not agree that Talen negotiated a

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license to the '430 patent on PacifiCorp's behalf.¹³ Without more, we are not persuaded that the allegations in PacifiCorp's Answer meaningfully support Patent Owner's argument that Colstrip's co-owner, Talen, should have been named as a real party in interest.

Third, Patent Owner asserts that "Talen specifically identified PacifiCorp as a real party in interest" in IPR2020-00832. Prelim. Resp. 30. In IPR2020-00832, Talen, "out of an abundance of caution," identified PacifiCorp, along with numerous other entities, as a "potential real party-in-interest." IPR2020-00832, Paper 3, 1–3. The Petition in IPR2020-00832 makes clear that none of the companies listed "agreed to be listed as a real-party in interest," and none "is funding, controlling, or directing, or otherwise has an opportunity to control or direct this Petition or proceeding." *Id.* at 2.

The panel in IPR2020-00832 recognized Talen's belief that PacifiCorp may be a real party in interest, but made no determination that Talen was in fact a real party in interest. IPR2020-00832, Paper 17, 9–10. Indeed, the institution decision explains that "over-identification of potential real parties-in-interest . . . does not appear to be a problem." *Id.* Under these circumstances, Talen's identification of PacifiCorp as a "potential real party-in-interest" in IPR2020-00832 does little to support Patent Owner's position that PacifiCorp should have identified Talen as a real party in interest in this proceeding.

¹³ In its Preliminary Response, Patent Owner asserts that a license exists covering "activity at the Colstrip power plant" but not PacifiCorp's other plants. Prelim Resp. 31 n.6.

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In sum, Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), but the current record does not provide sufficient reason to doubt Petitioners' assertion that Talen was not "funding this petition, advising on strategy for this petition, or exercising any control over Petitioners' decision to file the petition (or the arguments included therein)." Pet. 2; *see also* Reply 2.

The current record supports that PacifiCorp and Talen are co-owners of the Colstrip power plant and that Patent Owner granted a license covering the Colstrip power plant. Ex. 1113, 1; Prelim Resp. 31 n.6. Without more, this relationship does not make Talen a real party in interest to this proceeding, nor does it support that PacifiCorp was in privity with Talen in the Delaware Action. Therefore, on this record, we determine that the relationship between the PacifiCorp and Talen does not support that the Petition is time-barred.

III. ANALYSIS OF ASSERTED GROUNDS

A. *Level of Ordinary Skill in the Art*

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Furthermore, the prior art itself can reflect the appropriate level of ordinary skill in the art. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Petitioners assert that "[a] person of ordinary skill in the art ["POSITA"] would have at least a bachelor's degree in chemical

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engineering, mechanical engineering, or a related field of study with at least two years of experience implementing pollution control in power generation plants for natural gas, coal, and/or industrial waste incineration.” Pet. 11–12 (citing Ex. 1002 ¶¶ 48–51). Patent Owner does not dispute the level of ordinary skill in the art. *See generally* Prelim Resp.

For purposes of this Decision, we adopt Petitioners’ proposed definition of a POSITA because it is consistent with the skill level reflected in the disclosures of the ’430 patent and prior art. *See Okajima*, 261 F.3d at 1355 (the prior art may reflect an appropriate level of skill in the art).

B. Claim Construction

In an *inter partes* review, we construe a claim term “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). Under that standard, the words of a claim “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Claim terms need only be construed to the extent necessary to resolve the controversy. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011). On this record and for purposes of this Decision, we see no need to construe any claim term expressly.

C. Priority Analysis

The ’430 patent issued from Application 15/974,343 (“the ’343 Application”), filed May 8, 2018. Ex. 1001, codes (21), (22).

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The '343 Application claims priority, through several earlier non-provisional applications. *Id.* at code (60). The prior art asserted in this proceeding predates the filing date of the '343 Application and the earlier non-provisional applications. Pet. 19.

The '343 Application, however, claims priority, through several earlier non-provisional applications, to App. No. 60/605,640 (“the Provisional Application”), filed August 30, 2004 (Ex. 1001, code (60)), which predates all the prior art asserted. Thus, if the challenged claims of the '430 patent were entitled to the priority date of the Provisional Application, none of the asserted prior art would qualify as prior art.

A patent’s claims, however, “are not entitled to an earlier priority date merely because the patentee claims priority. Rather, for a patent’s claims to be entitled to an earlier priority date, the patentee must demonstrate that the claims meet the requirements of 35 U.S.C. § 120.” *In re NTP, Inc.*, 654 F.3d 1268, 1276 (Fed. Cir. 2011) (citations omitted). Under § 120, a claim is entitled to the priority to a prior application’s filing date only if the prior application discloses the claimed invention “in the manner provided by [§] 112(a) (other than the requirement to disclose the best mode).” Section 112(a) in turn requires the specification to, among other things, contain a written description of the claimed invention.

The test for sufficiency of a written description under 35 U.S.C. § 112(a) is whether the earlier application’s disclosure “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). That test “requires an

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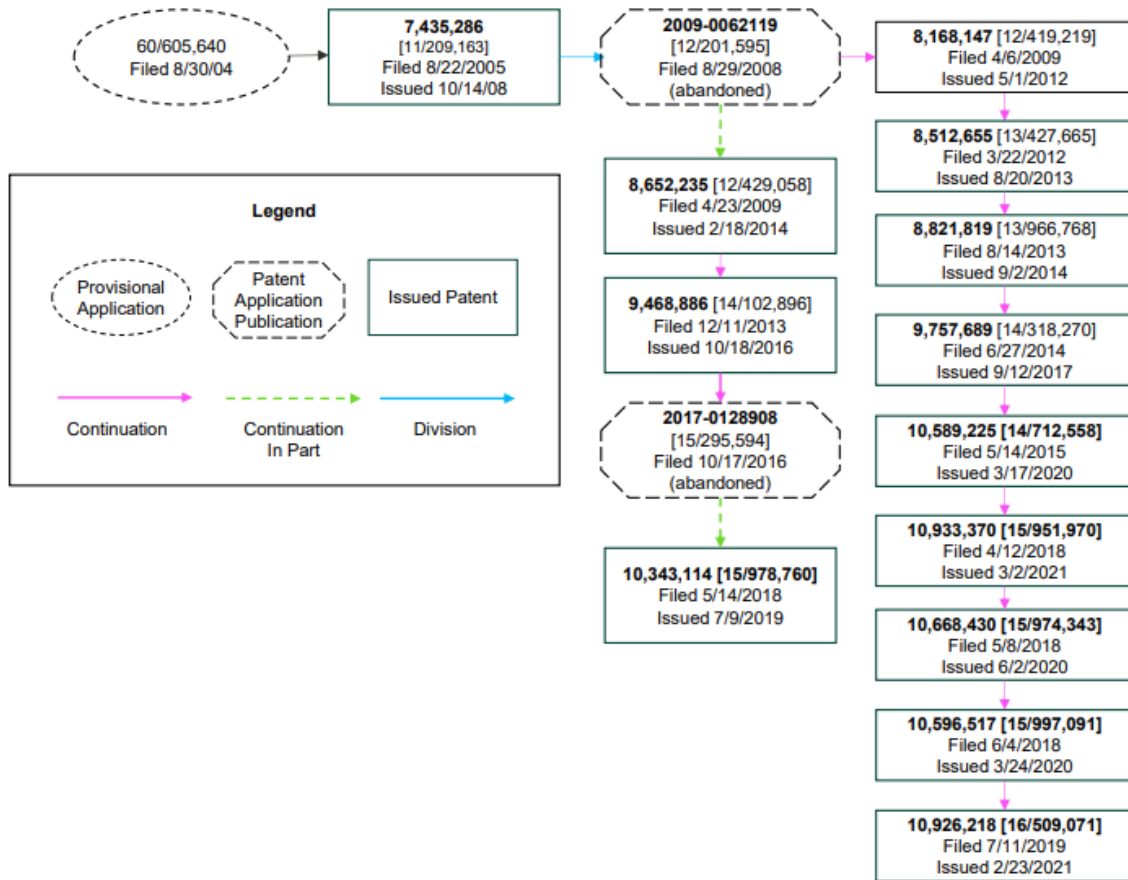
objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.” *Id.*

In an *inter partes* review, although the petitioner has the ultimate burden of persuasion to prove unpatentability, the patent owner must demonstrate entitlement to a priority date when the patent owner relies on that priority date to overcome an anticipation or obviousness argument. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1379–80 (Fed. Cir. 2015).

On the current record, and for purposes of this Decision, we find Patent Owner has not shown sufficiently that the challenged claims of the ’430 patent are entitled to the priority date of the Provisional Application.

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Petitioners provide the following family tree of the '430 patent:



Ex. 1004.

The parties group these applications into three categories: the Provisional Application, the applications filed before April 12, 2018 (“Pre-2018 Applications”), and the applications filed on or after April 12, 2018 (“Post-2018 Applications”). *See, e.g.*, Prelim. Resp. 9.

This grouping reflects Petitioners’ assertion that Application No. 15/951,970 (“the ’970 application”) made “extensive” changes to the specification. Pet. 20 (citing Ex. 1064 (comparison of the ’970 application to the immediately prior application)). According to Petitioners, limitations “directed to what species of bromine-containing ingredient is added and

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where it is added,” which Petitioners term “Newly-Introduced Limitations,” do not have written-description support in applications before the ’970 applications. *Id.* at 21. Petitioners argue that before April 2018, when the ’970 application was filed, a POSITA “would not have concluded Applicants were in possession of the subject matter of the issued claims of the ’430 Patent.” *Id.* at 20. Thus, Petitioners contend that Patent Owner is not entitled to claim priority to the Provisional Application.

Patent Owner disagrees with Petitioners. Prelim. Resp. 7–26. The parties dispute (1) whether the Pre-2018 Applications provide express support for Newly-Introduced Limitations; and (2) whether the Provisional Application itself provides sufficient written-description support for the Newly-Introduced Limitations. Pet. 24–27, 39–44; Prelim. Resp. 9–13, 15–25. On this record, we find Petitioners’ arguments more persuasive.¹⁴ We address these arguments in turn.

1. Express Support for Adding Bromine to the Coal

Each of the challenged claims requires that adding to the coal “an additive comprising Br₂, HBr, a bromide compound, or a combination thereof.” Ex. 1001, 35:55–57, 38:1–3, 38:21–23. Petitioners contend that

[t]he Pre-2018 Applications do not support adding any halogens to the coal or combustion chamber, let alone the particular bromine-containing ingredients claimed in the ’430 Patent. This

¹⁴ The parties also dispute whether the Provisional Application was incorporated by reference into the Pre-2018 Applications. Pet. 28–39; Prelim. Resp. 13–15. We do not need to resolve this issue because as explained below, even if all the disclosures of Provisional Application were considered, they would not provide written description support for the challenged claims. *See infra* Section III.C.2.

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is because the Pre-2018 Applications are directed to preparing a brominated activated carbon . . . outside mercury-containing flue gas . . . , and then injecting the pre-brominated sorbent into the mercury-containing flue gas . . . downstream from the combustion chamber.

Pet. 25.

According to Petitioners, all three named inventors confirmed that none of the examples in the Pre-2018 Applications disclosed adding bromine to coal. *Id.* at 27 (citing Ex. 1095, 128:20–25; Ex. 1097, 116:22–125:17; Ex. 1093, 156:5–170:5. Therefore, Petitioners argue the Pre-2018 Applications do not provide written-description support for the challenged claims. *Id.* at 24–27.

Patent Owner argues that paragraph 56 of the Pre-2018 Applications¹⁵ discloses adding bromine to the coal in the combustion chamber by disclosing “the practice of adding the promotor and sorbent at one or multiple locations.” Prelim. Resp. 15.

The Board previously addressed this issue in IPR2020-00832:

Paragraph 56 explains that “single injection points 116 or 119 are shown in Figure 3, although one skilled in the art will understand that multiple injection points are within the scope of the present invention.” Ex. 1022, 11, ¶ 56. However, this refers to injection points in flue gas stream 15 described in paragraph 55 of the ’595 application, not multiple injection points at different points in the process (e.g., in the flue gas stream, in the combustion chamber, or with coal). *Id.* at 10–11, ¶ 55.

¹⁵ Patent Owner states that the “Pre-2018 Applications contain substantively identical disclosures” and cites to the Application No. 12/201,595 (“the ’595 Application,” Ex. 1022) as representative. Prelim. Resp. 13. For convenience, we do the same.

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Further, to the extent Patent Owner argues there is written description support in the [Pre-2018 Applications] for adding the promoter to the coal or to the combustion chamber . . . because this would have been an obvious variation of the '595 application's disclosure, rendering an invention obvious does not satisfy the written description requirement.

IPR2020-00832, Paper 17, 28–29.

On the current record, and for purposes of institution, we agree with the Board's previous determination and adopt it as our own.

Patent Owner acknowledges that the Pre-2018 Applications do “not contain provisional figure 2,” but argues that they do “provide a similar disclosure of bromine species being added to coal.” Prelim. Resp. 15. Specifically, Patent Owner points to the Pre-2018 Applications for disclosing an example, in which “the halogen/halide promoted carbon sorbent was injected into the flue gas after the boiler. In general, however, the inventive sorbent can be injected where desired (e.g., before, after, or within the boiler). *Id.* (citing Ex. 1022 ¶ 107).

Patent Owner argues that “[b]ecause a halogen/halide promoted sorbent necessarily includes a halogen/halide such as Br₂, HBr, or Br-, a POSITA would recognize that adding this material before the boiler necessarily results in the limitations at issue in the '[430] Patent.” *Id.* The Board addressed this issue in IPR2020-00832 too:

For this example [described in ¶ 107], the '595 application discloses “the halogen/halide promoted carbon sorbent was injected into the flue gas after the boiler.” *Id.* Thus, this passage describes a combination of promoter and sorbent material being added at one single point: “into the flue gas after the boiler.” The '595 application continues the description of this example by stating “[i]n general however, the inventive sorbent can be

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injected where desired (e.g., before, after, or within the boiler).” *Id.* Although this describes other injection points (“e.g., before, after, or within the boiler”), this disclosure regards the promoted sorbent material. As a result, it describes the addition of both the promoter and the sorbent material at a single point, not (1) the addition of the promoter with the coal or the combustion chamber and (2) the injection of the sorbent material into mercury-containing gas downstream of the combustion chamber. . . . As a result, we do not agree with Patent Owner’s arguments regarding paragraph 107 of the ’595 application.

IPR2020-00832, Paper 17 at 28.

On the current record, and for purposes of institution, we agree with the Board’s previous analysis and adopt it as our own.

In sum, on this record, Patent Owner has not shown that the Pre-2018 Applications expressly disclose adding bromine to the coal in the combustion chamber. Thus, Patent Owner has not shown that the Pre-2018 Applications provide sufficient written-description support for the challenged claims.

2. Provisional Application

Petitioners argue that the Provisional Application does not support two aspects of the challenged claims: (1) the claimed genus of “Br₂, HBr, a bromide compound, or a combination thereof;” and (2) adding the claimed genus to the coal “before the coal enters the combustion chamber.” Pet. 39–44.

a. The Claimed Genus

As support for the claimed genus of bromine additives, Patent Owner points to the following disclosure in the Provisional Application as explaining “the scientific basis for the invention:”

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We now teach that the formation of the new bromide compound with carbon increases the reactivity of the carbon forms toward mercury and other pollutants. The resulting bromide compound is uniquely suited to facilitate oxidation of the mercury. The effectiveness of the oxidation results from the promotion effect of the halide exerted on the developing positive charge on the mercury during the oxidation, known in the chemical art as a specific catalytic effect. Thus, as the mercury electrons are drawn toward the positive carbon, the halide anion electrons are pushing in from the other side, which stabilizes the positive charge developing on the mercury and lowers the energy requirement for the oxidation process. Bromide is especially reactive, owing to the highly polarizable electrons in the outer 4p orbitals of the ion. Thus, adding HBr or Br₂ to the carbon forms a similar carbon bromide, in which the positive carbon oxidizes the mercury with the assistance of the bromide ion.

Prelim. Resp. 9–10 (quoting Ex. 1020, emphasis removed).

From this disclosure, Patent Owner contends that “the benefits of the claimed promoted sorbent are obtained by forming a carbon bromide out of activated carbon and a negative Bromine ion, *i.e.*, Br-.” *Id.* at 10. In addition, “this bromine Br- ion may be supplied by adding HBr or Br₂ (both of which contain Br-) to the carbon.” *Id.* According to Patent Owner, the Provisional Application thus teaches that “[w]hen these components are mixed into mercury-containing gas, the mercury (Hg) is drawn toward the carbon, and the Bromine ion is drawn toward the mercury, creating a stable bond.” *Id.* at 10–11. We are not persuaded by Patent Owner’s argument.

Petitioners contend that the alleged “scientific basis for the invention” describes a “chemical model” in which bromine ions and activated carbon downstream of the combustion chamber, “but that says nothing about

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whether chemicals are added to coal, rather than added downstream or formed *in situ*.” Reply. 15.

On the current record, it is unclear to what extent, if at all, the alleged “scientific basis for the invention” describes adding bromine to coal. Written description requires more than that the disclosure renders the claimed subject matter obvious. *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571–72 (Fed. Cir. 1997) (“The question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, a prior application itself must describe an invention.”); *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008) (“Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed.”).

Patent Owner points to the following disclosure of using an optional second component as providing support for the claimed genus:

It has been demonstrated that addition of an optional second component, in addition to the bromine, results in improved reactivity and capacity for the sorbent, exceeding that of both the untreated carbon and the brominated carbon. The second compound comprises either a second halogen or a compound from a second halogen, such as HBr.

Prelim. Resp. 11 (citing Ex. 1020, 10¹⁶).

Patent Owner also points to provisional example 1E as disclosing “additional substance is a compound comprised of a Group V or VI element or combination of Group V or VI with Group VII element, such as SCl₂,

¹⁶ Patent Owner’s preliminary response cited page 12 of the Exhibit 1020. The cited passage appears at page 10. We deem this harmless error.

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1-10 wt% of bromine.” Prelim. Resp. 11, 17–18. Patent Owner interprets example 1E as disclosing “the use of various bromine-containing compounds.” *Id.* at 18 (citing Ex. 1002 ¶ 61) (Dr. Niksa testifying that bromine is a Group VII element)); Sur-reply 15. Petitioners interpret example 1E differently, contending that it discloses only the bromine compound HBr. Pet. 40–41; Reply 15.

Before considering whether example 1E provides support for the claimed genus, we first discuss what example 1E discloses.¹⁷ Here, Petitioners’ interpretation of example 1E as disclosing only HBr is too narrow. Example 1E discloses that the additional substance may be a “combination of Group V or VI with Group VII element” where the recited “Groups” correspond to element groupings in the periodic table. Ex. 1001, 11:29–31, 28:48–49; *see also* Ex. 1002 ¶¶ 60 (“Group V of the periodic table contains nitrogen (N), phosphorus (P), and other less common elements. Group VI contains oxygen (O), sulfur (S), and other less common elements.”), 61 (Dr. Niksa testifying that Group VII includes bromine). Thus, example 1E discloses that the additional substance may comprise a combination of bromine with Group V or Group VI elements.

We now consider whether the disclosure of HBr and compounds comprising bromine and Group V or Group VI elements supports the genus of “Br₂, HBr, a bromide compound, or a combination thereof.” In this

¹⁷ Petitioners argue that there is no disclosure that the “additional substance” of example 1E is the additive supplied before the boiler. Pet. 40. For purposes of this discussion, we assume that the additional substance is the additive supplied before the boiler. If this issue remains before us, we will resolve it on a more fully developed record.

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regard, we note that the recited “bromide compound” is quite broad, encompassing far more than just compounds formed by the combination of bromine with Group V and Group VI elements. *See* Ex. 1002 ¶ 194 (Dr. Niksa explaining that “there are a nearly infinite number of forms of bromide compounds”). The term “bromide compound” would include, for example, the sodium bromide compound relied upon by Patent Owner as evidence of reduction to practice in IPR2020-00422. IPR2020-00422, Paper 19, 24–15 (“[T]he inventors reduced the claims of the ’430 Patent to practice by performing tests using sodium bromide as the pre-combustion chamber additive.”); *see also* Ex. 1002 ¶ 58 (identifying sodium as a Group I element).

On this preliminary record, we are not persuaded that the disclosure of HBr and compounds formed by the combination of bromine with Group V and Group VI elements supports the full scope of the claimed genus. Provisional example 1E does not disclose Br₂, and the record shows that Br₂ and HBr have different properties. *See e.g.*, Ex. 1002 ¶ 390 (Dr. Niksa testifying that Br₂ has a boiling point of 58.8 °C whereas HBr has a boiling point of -66.38 °C). In addition, Patent Owner does not direct us to persuasive evidence that compounds formed by the combination of bromine with, for example, a Group I, Group II, or Group III element would be expected to have similar properties as compounds formed by the combination of bromine and a Group VI or Group VII element.

Patent Owner argues that the Provisional Application describes the genus by providing a “structure-function correlation.” Prelim. Resp. 20. Specifically, Patent Owner contends that the disclosure it identifies as

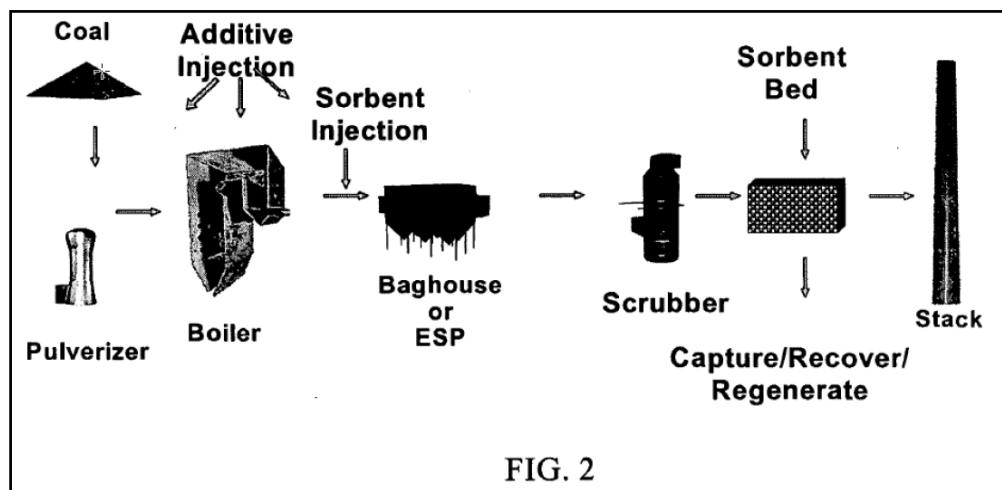
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providing the “scientific basis for the invention” (discussed above) illustrates “the interaction between activated carbon, mercury and Br- ions,” from which “a POSITA would understand that the common attribute of the relevant genus is a chemical that can supply a Br- ion, *i.e.*, a bromide.” *Id.* As discussed above, it is unclear to what extent, if at all, the disclosure Patent Owner relies upon extends to bromine added to coal.

In sum, on this record, and for purposes of institution, Patent Owner has not sufficiently shown that the Provisional Application supports the full scope of the claimed genus.

b. Adding the Genus to Coal Before It Enters the Combustion Chamber

As support for adding the claimed genus of bromine additives to the coal, Patent Owner points to Figure 2 of the Provisional Application and its accompanying description. Prelim. Resp. 12. Figure 2 is reproduced below.



Ex. 1020, Fig. 2. As described in the Provisional Application:

FIG. 2 is a block diagram illustrating the use of the invention in a coal fueled facility. . . . FIG. 2 shows a boiler for burning pulverized coal. The facility utilizes various devices to clean the exhaust of the boiler. In this example, a baghouse or ESP is used to collect particulates in the exhaust. A scrubber and

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sorbent bed are also used to remove undesired constituents from the flue gas stream, before being fed to the stack. In the example shown, the sorbent is injected into the flue gas after the boiler. The additive can be injected where desired (e.g., before, after, or within the boiler).

Id. at 12. Patent Owner contends that Figure 2 and its accompanying text provide support for adding a bromine-containing additive to the coal.

Prelim. Resp. 12.

Petitioners argue that the “before the boiler” language in the Provisional Application “does not expressly or inherently disclose any bromine-containing species supplied ‘to the coal,’ as opposed to elsewhere upstream of the boiler.” Pet. 43. Petitioners contend that “[t]here are numerous systems in a coal plant ‘before . . . the boiler’ that could deliver halogens, but do not interface with the coal.” *Id.* (citing Ex. 1027, 13-3 to 13-5). For example, an additive could be fed directly to the combustion chamber as part of a separate stream of “Secondary Air.” *Id.* (citing Ex. 1002 ¶ 189).

Patent Owner argues that

a POSITA would understand that . . . claim [1] refers to the two ways that bromine could be added to the combustion chamber: either it is added to the coal and then passed through the coal entry ports, or it is added through secondary air ports into the combustion chamber. This is consistent with the provisional application which describes adding the bromine “before” or “within” the boiler.

Prelim. Resp. 24.

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We are not persuaded by this argument. The Federal Circuit has instructed that

[e]ntitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. It extends only to that which is disclosed. While the meaning of terms, phrases, or diagrams in a disclosure is to be explained or interpreted from the vantage point of one skilled in the art, all the limitations must appear in the specification. The question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, a prior application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought.

Lockwood, 107 F.3d at 1571–72. Here, what “a POSITA would understand,” without disclosure in the specification, is insufficient to show written-description support.

Thus, on this record, and for purposes of institution, Patent Owner has not shown that the Provisional Application provides sufficient support for adding the claimed genus to the coal.

3. Summary

In sum, on this record, Patent Owner has not shown that either the Provisional Application or the Pre-2018 Applications provide sufficient written-description support for the challenged claims. As a result, we determine that the ’430 patent cannot claim priority to the Provisional Application. Thus, all asserted prior art qualify as prior art.

D. Alleged Obviousness over Sjostrom and Eckberg or Olson-646

Petitioners assert that claims 1–4 and 6–29 would have been obvious over Sjostrom and Eckberg (Ground 1), and over Sjostrom and Olson-646

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(Ground 2). Pet. 48–103. Based on this record, and for at least the following reasons, we determine Petitioners have established a reasonable likelihood that they would prevail in these assertions.

1. Prior Art Status of Sjostrom and Eckberg

Petitioners assert Sjostrom and Eckberg qualify as printed publications. Pet. 45. According to Petitioners, Sjostrom and Eckberg are available as prior art under 35 U.S.C. §§102(a) and (b) (pre-AIA) or §102(a)(1) (post-AIA). *Id.* at 44.

Petitioners argue that the “Sjostrom and Eckberg presentations, delivered at [Electric Utilities Environment Conference] EUEC on January 25, 2005 and mailed on CD to conference participants within a few weeks,” meet the standard for public accessibility set forth in *GoPro, Inc. v. Contour IP Holding LLC*, 908 F.3d 690, 693 (Fed. Cir. 2018). *Id.* at 45–47.

The standard for public accessibility is one of “reasonable diligence,” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016), to locate the information by “interested members of the relevant public.” *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1569 (Fed. Cir. 1988). Accordingly, “[a] reference will be considered publicly accessible if it was ‘disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.’” *Blue Calypso*, 815 F.3d at 1348 (quoting *Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)).

Patent Owner argues that “Petitioners rely on their paid technical expert’s largely uncorroborated fact testimony regarding a conference that

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took place twenty years ago.” Prelim. Resp. 27. Patent Owner asserts that “Petitioners have not corroborated the number of people in attendance at this track during the relevant time, nor whether those people were skilled in the art.” Thus, Patent Owner concludes that “Petitioners have not provided sufficient evidence that Sjostrom and Eckberg were disseminated or otherwise made available to . . . persons interested and ordinarily skilled in the subject matter or art.” *Id.* (quotation marks omitted). We are not persuaded by Patent Owner’s argument.

Petitioners provide evidence, through the testimony of Dr. Niksa, who attended and delivered a presentation at the 2005 EUEC, that Sjostrom and Eckberg were presented on January 25, 2005 at the 2005 EUEC. Ex. 1002 ¶¶ 268–279; Ex. 1030, 2–3, 7, 23, 32, 106–118. Dr. Niksa testifies that there were over 800 attendees. Ex. 1002 ¶ 276. Other evidence corroborates Dr. Niksa’s testimony. Ex. 1030, 103–118 (list of attendees); Ex. 1031. Petitioners’ evidence does not indicate that attendance of the 2005 EUEC was restricted, and the evidence indicates that the CD appears to have been disseminated with without any apparent restriction or expectation of confidentiality. Ex. 1002 ¶¶ 273–274; Ex. 1010; Ex. 1011; Ex. 1030, 103–118; Ex. 1031; *GoPro*, 908 F.3d at 694–95.

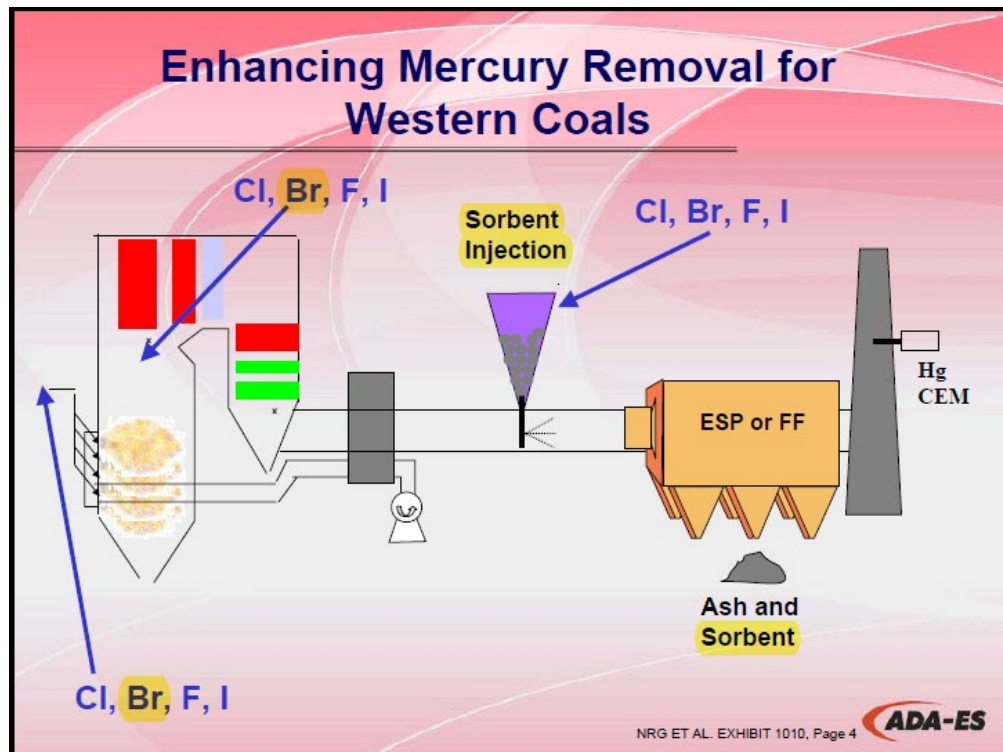
Therefore, on this record, Petitioners have sufficiently demonstrated a reasonable likelihood that Sjostrom and Eckberg were publicly available, and thus, qualify as printed publications. *See Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 28 (PTAB Dec. 20, 2019) (Paper 29) (precedential).

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2. Asserted Prior Art

a. *Sjostrom*

Sjostrom is entitled “Full Scale Evaluations of Mercury Control Technologies with PRB [Powder River Basin] Coals.” Ex. 1010, 1. Sjostrom identifies multiple power plants that used “activated carbon injection to improve mercury control” and identifies the ACI equipment used. *Id.* at 10–11. Sjostrom includes the following Process Diagram:



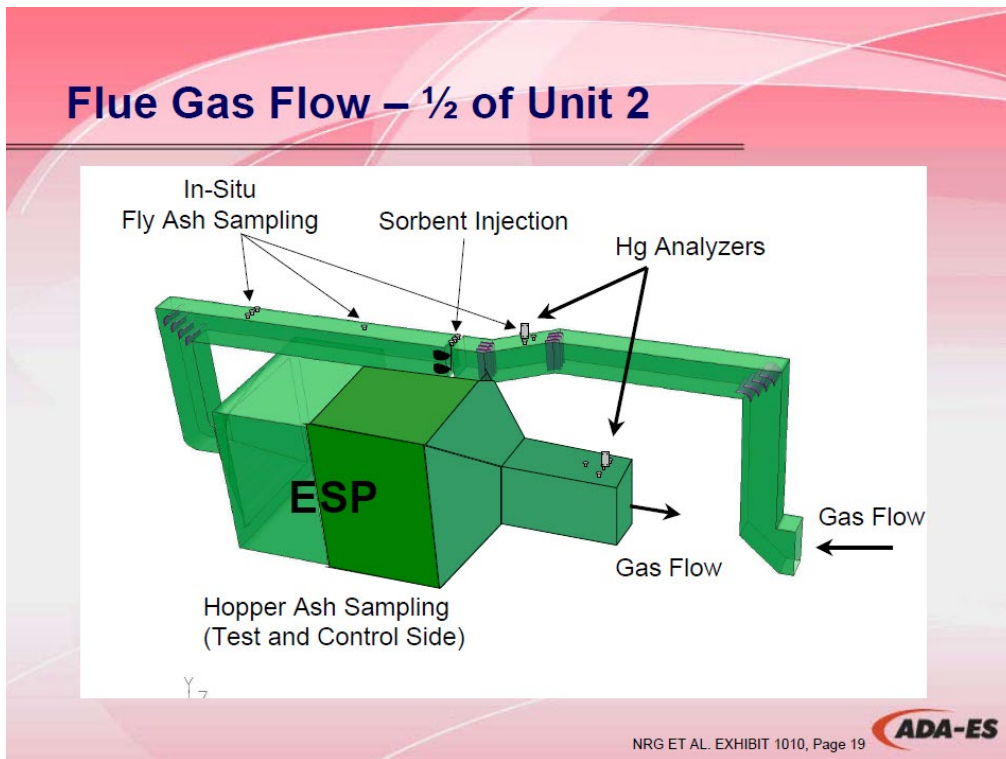
Ex. 1010, 4.

Sjostrom’s Process Diagram is captioned “Enhancing Mercury Removal for Western Coals.” *Id.* The figure includes a boiler (or combustion chamber) on the left and arrows pointing to what appears to be upstream of the boiler, into the boiler, and to a “Sorbent Injection” device, which appears to be located downstream of the boiler. *Id.* The arrows are labeled with

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chemical species, such as bromine. *Id.* An “ESP or FF” is located on the right side of the figure with “Ash and Sorbent” located below the “ESP or FF” device. *Id.* The far-right side also has a “Hg CEM” notation. *Id.*

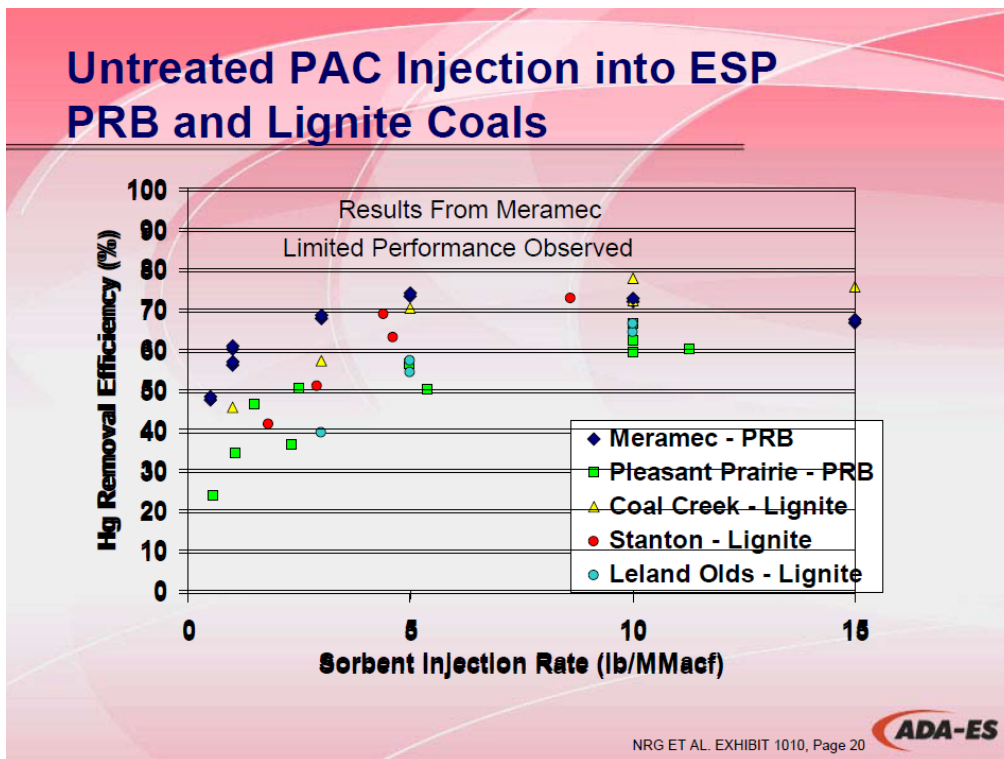
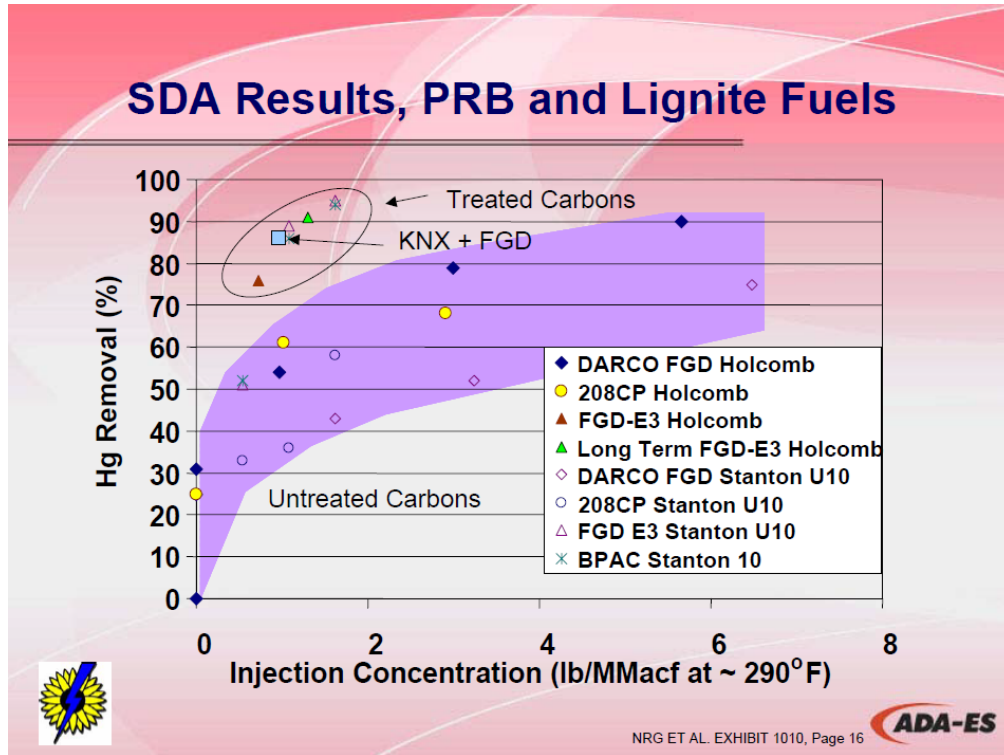
Sjostrom provides the following drawing when discussing “Flue Gas Flow – ½ of Unit 2:”



Id. at 19. Sjostrom’s Flue Gas Flow drawing includes arrows indicating “Hg Analyzers.” *Id.*

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Sjostrom also includes the following graphs:

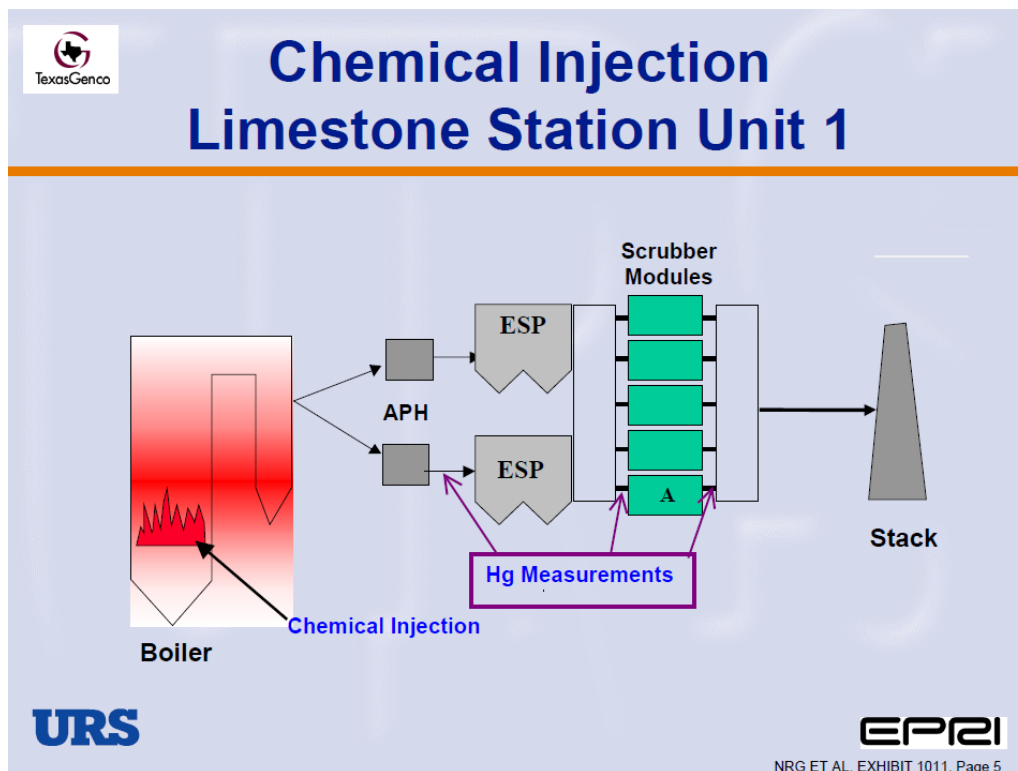


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Id. at 16, 20. The above graphs are scatter plots and are captioned “SDA Results, PRB and Lignite Fuels” and “Untreated PAC Injection into ESP PRB and Lignite Coals.” *Id.* at 16, 20.

b. Eckberg

Eckberg is entitled “Mercury Control Evaluation of Halogen Injection into a Texas Lignite-Fired Boiler.” Ex. 1011, 1. Eckberg includes the following process figure:



Ex. 1011, 5. Eckberg’s process figure includes a boiler on the left, with an arrow pointing to the boiler that is labeled “Chemical Injection.” *Id.* Eckberg further describes CaBr_2 as a chemical addition for its tests and refers to a “Salt Solution Tank” when depicting injection equipment. *Id.* at 3, 8–9.

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c. Olson-646

Olson-646 is a patent publication of Application No. 11/209,163 (“the ’163 application”). Ex. 1012, code (21). It “relates to methods and materials for the removal of pollutants from flue gas or product gas from a gasification system. In particular, mercury is removed from gas streams generated during the burning or gasification of fossil fuels by highly reactive regenerable sorbents.” *Id.* ¶ 4.

Olson-646 proposes a model for the oxidation of mercury in Figure 2, which is reproduced below.

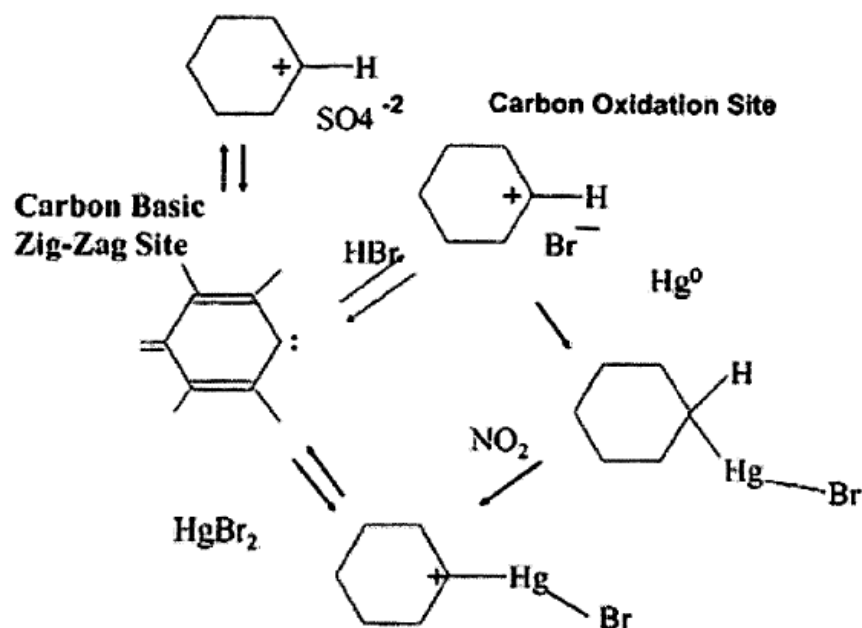


FIG. 2

Figure 2 is a proposed mechanistic model of the chemical reactions in the oxidation and capture of mercury. *Id.* ¶ 33.

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Olson-646 explains that “as illustrated in FIG. 2, hydrogen bromide reacts with the unsaturated structure of the activated carbon” and this “may be, by way of illustration only, a carbene species on the edge of the graphene sheet structures of the carbon.” *Id.* ¶ 54. According to Olson-646, “[m]olecular bromine or a bromine compound reacts to form a similar structure, with a positive carbon that is active for oxidizing the mercury with subsequent capture by the sorbent.” *Id.*

Olson-646’s Figure 3 is reproduced below.

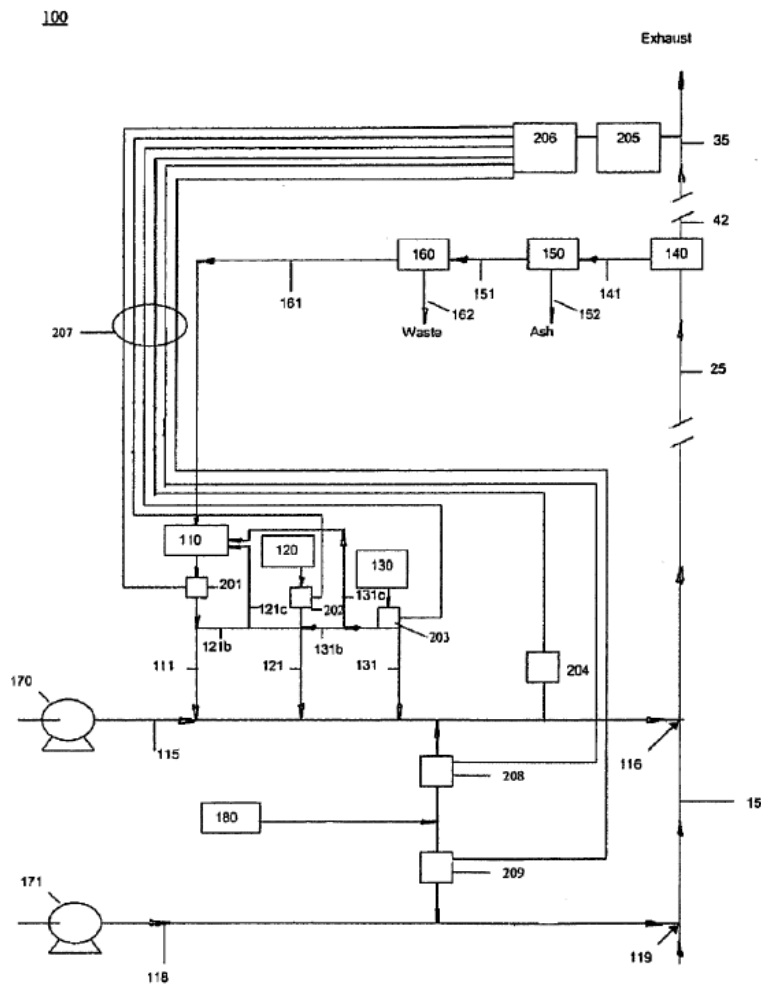


FIG. 3

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Figure 3 is schematic for the preparation of promoted carbon sorbents and processes for flue gas mercury reduction in flue gases. Ex. 1012 ¶ 34.

Figure 3 depicts a schematic flow diagram of a “mercury control system 100 comprising preparation of promoted carbon sorbents” that includes a “base activated carbon reservoir 110, an optional halogen/halide promoter reservoir 120, an optional secondary component reservoir 130, and an optional a[l]kali component reservoir 180, each of which with corresponding flow control device(s) 201, 202, 203, and 208/209, respectively.” *Id.* ¶ 56. Olson-646 further explains that in “operation, promoted carbon sorbent and/or an optional alkali component is injected into contaminated flue gas stream 15.” *Id.* ¶ 61.

3. Analysis

Petitioners contend that claims 1–4 and 6–29 would have been obvious over the combination Sjostrom and Eckberg (Ground 1) or the combination of Sjostrom and Olson-646 (Ground 2). Pet. 48–103. At this preliminary stage, Patent Owner does not substantively address Petitioners’ arguments regarding the combined teachings of Sjostrom and Eckberg or Sjostrom and Olson-646. *See generally* Prelim. Resp.

After reviewing Petitioners’ contentions and evidence, we determine Petitioners have established a reasonable likelihood that claims 1–4 and 6–29 would have been obvious over Sjostrom and Eckberg, or over Sjostrom and Olson-646.

E. Alleged Anticipation by Olson-235

Petitioners assert that Olson-235 anticipates claims 1, 3, 6, 7, and 10–29. Pet. 103–115. Based on this record, and for at least the following

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reasons, we determine Petitioners have established a reasonable likelihood that they would prevail in this assertion.

1. Olson-235

Olson-235 is a patent issued from an application that is a continuation-in-part of a divisional of the '163 application (which published as Olson-646). Ex. 1018, code (60); Ex. 1012, code (21). As such, Olson-235 includes disclosures that are substantially similar to those discussed above in Olson-646 (*supra* Section III.D.2.c). *See, e.g.*, Ex. 1018, 1:20–24, 8:63–9:4, 14:30–32, 16:60–17:2, Fig. 2, Fig. 3.

Olson-235 further discloses “monitoring the mercury content of the cleaned gas” in which “the carbon base sorbent and the promoter are introduced into the mercury-containing gas at the same location or at separate locations.” *Id.* at 6:55–59. According to Olson-235, “[w]here possible and desirable, the mercury control technology of the present invention may preferably utilize continuous measurement of mercury emissions as feedback to assist in control of the sorbent injection rate.” *Id.* at 20:1–5.

2. Analysis

Petitioners assert that Olson-235 discloses all the limitations of claims 1, 3, 6, 7, and 10–29. Pet. 104–115. At this preliminary stage, Patent Owner does not substantively address Petitioners’ arguments regarding the disclosures of Olson-235. *See generally* Prelim. Resp.

After reviewing Petitioners’ contentions and evidence, we determine Petitioners have established a reasonable likelihood that Olson-235 anticipates claims 1, 3, 6, 7, and 10–29.

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IV. CONCLUSION

Based on the current record, and for the reasons explained above, we find Petitioners have demonstrated a reasonable likelihood that they would prevail with respect to at least one claim challenged in the Petition. We, therefore, institute an *inter partes* review of all challenged claims on all asserted grounds.

This Decision is not a final determination on the patentability of any challenged claim. Our view with regard to any conclusion reached in the foregoing could change upon further development of the record during trial. We remind the parties that any argument not raised in a Patent Owner Response to the Petition, or as permitted in another manner during trial, shall be deemed forfeited and/or waived even if asserted in the Preliminary Response. *In re Google Tech. Holdings LLC*, 980 F.3d 858, 862–64 (Fed. Cir. 2020) (holding an argument forfeited when not timely raised before the Board); *In re NuVasive, Inc.*, 842 F.3d 1376, 1380–81 (Fed. Cir. 2016) (holding Patent Owner waived an argument addressed in the Preliminary Response by not raising the same argument in the Patent Owner Response).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is hereby instituted on all challenged claims of the '430 patent based on the asserted grounds set forth in the Petition; and

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

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FOR PETITIONER:

Brian Oaks
David Tobin
Syed Fareed
Christian Tatum
MCDERMOTT WILL & EMERY LLP
boaks@mwe.com
dtobin@mwe.com
sfareed@mwe.com
ctatum@mwe.com

R. Scott Johnson
Thomas Patton
FREDRIKSON & BYRON, P.A.
rsjohnson@fredlaw.com
tpatton@fredlaw.com

Michelle Kemp
PERKINS COIE LLP
kemp-ptab@perkinscoie.com

Michael Piery
Lauren Bolcar
QUARLES & BRADY LLP
michael.piery@quarles.com
lauren.bolcar@quarles.com

FOR PATENT OWNER:

Hamad Hamad
Justin Nemunaitis
Richard Cochrane
CALDWELL, CASSADY & CURRY P.C.
hhamad@caldwellcc.com
jnemunaitis@caldwellcc.com
rcochrane@caldwellcc.com