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Paper No. 7
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIVE POWER INTELLIGENCE COMPANY NA, LLC,
Petitioner,

v.

GENSCAPE INTANGIBLE HOLDING, INC.,
Patent Owner.

Case IPR2019-00189
Patent 6,714,000 B2

Before ERICA A. FRANKLIN, JENNIFER MEYER CHAGNON, and WESLEY B. DERRICK, *Administrative Patent Judges*.

DERRICK, *Administrative Patent Judge*.

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

I. INTRODUCTION

Live Power Intelligence Company NA, LLC ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1, 9, and 11 of U.S. Patent No. 6,714,000 B2 ("the '000 patent," Ex. 1002). Paper 2 ("Pet."). Genscape Intangible Holding, Inc. ("Patent Owner") declined to file a Patent Owner Preliminary Response.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314; 37 C.F.R. § 42.4(a). We may not institute an *inter partes* review "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). For the reasons set forth below, we institute an *inter partes* review on all grounds and challenged claims.

II. BACKGROUND

A. Real Parties in Interest

Petitioner Live Power Intelligence Company NA, LLC identifies Scottsdale Insurance Company as an additional real party in interest. Pet. 1. Patent Owner Genscape Intangible Holding, Inc. identifies itself as the real party in interest, and that it is wholly owned by Genscape, Inc., which is wholly owned by DMGT US, Inc. Paper 3, 1–2.

B. Related Matters

Petitioner identifies a now-dismissed lawsuit as a related matter: *Genscape Intangible Holding, Inc. v. Live Power Intelligence Co. NA, LLC*, Case No. 1:17-cv-02452-PAB-SKC (D. Colo.). Pet. 1.

Petitioner also concurrently filed an additional petition for review of related U.S. Patent No. 7,088,090 B2—IPR2019-00169. IPR2019-00169, Paper 2.

C. The ’000 Patent (Ex. 1002)

The ’000 patent is titled “Method for Monitoring Power and Current Flow,” and is directed to a method for remotely monitoring the magnitude and direction of net electrical power and current flow through monitored line(s). Ex. 1002, [54], Abstract.

D. Challenged Claims

Petitioner challenges claims 1, 9, and 11 of the ’000 patent, reproduced below.

> 1. A method for measuring electrical power dynamics of a facility, comprising:
>
> placing at least one apparatus comprising a magnetic transducer and an electric transducer in proximity to and not connected to at least one electrical line connected to the facility;
>
> receiving electric and magnetic fields of said at least one electrical line with said at least one apparatus;
>
> processing said electric and magnetic fields to obtain information representative of magnitude and relative phase of said electric and magnetic fields;
>
> transmitting said information to a central computing site;
>
> determining said electrical power dynamics of said facility from said information at said central computing site; and
>
> relaying data regarding said electrical power dynamics to an end-user.
>
> 9. A method for remotely delivering real-time information regarding operational status of a power system, said method comprising:
>
> converting magnetic field of current at a location remote to a plurality of electrical lines of said power system into magnetically transduced signals;
>
> conditioning said magnetically transduced signals into conditioned magnetically transduced signals;

conditioning a reference signal for each of said conditioned magnetically transduced signals into conditioned reference signals;

measuring magnitude of each of said conditioned magnetically transduced signals;

measuring a phase angle between respective said conditioned magnetically transduced signals and said conditioned reference signals;

transmitting said magnitudes and said phase angles to a central facility;

determining said real-time information from said magnitudes and said phase angles, at said central facility;

relaying said real-time information to an end user.

11. A method for providing information relating to current in an electrical line to a remote end user, comprising:

placing an apparatus comprising a magnetic transducer in proximity of and not connected to said electrical line;

receiving magnetic field emanating from said electrical line with said magnetic transducer;

receiving an electrical signal synchronized to power system frequency with said apparatus;

processing said magnetic field and said electrical signal to determine said information relating to said current in the line; and

transmitting said information to said remote end user.

Ex. 1002, 79:2–19, 79:42–80:16, 80:21–34.

E. The Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 9, and 11 are unpatentable under 35 U.S.C. § 103 as follows (Pet. 4, 22–61):

Ground	References
1	Libove[1] in view of Blatt[2] and Fernandes[3]
2	Libove in view of Fernandes and IEEE Std 644-1994[4]

Petitioner supports the Petition with the testimony of Robert G. Olsen, Ph.D. (Ex. 1007).

III. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art for the ’000 patent would have had “a Master’s degree in electrical engineering or applied physics with a focus in power transmission, or a Bachelor’s degree in electrical engineering or applied physics, or a similar field, with approximately two years of experience relating to power transmission.” Pet. 12. Petitioner further contends that “[a]dditional graduate education might substitute for experience” and that “significant experience in the field of power transmission might substitute for formal education.” *Id.*

On this record, we adopt Petitioner’s definition of the level of ordinary skill at this stage of the proceeding. We further note that the prior

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[1] Libove & Singer, U.S. Patent No. 5,473,244, issued December 5, 1995 (Ex. 1003).
[2] Blatt, U.S. Patent No. 5,408,176, issued April 18, 1995 (Ex. 1004).
[3] Fernandes, U.S. Patent No. 4,709,339, issued November 24, 1987 (Ex. 1005).
[4] *IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields From AC Power Lines*, IEEE Std 644-1994 (Ex. 1006). On its face, IEEE Std 644-1994 states that it was “[a]pproved December 13, 1994,” and “[p]ublished 1995.” Ex. 1006, i.

art itself demonstrates the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that "specific findings on the level of skill in the art . . . [are not required] 'where the prior art itself reflects an appropriate level and a need for testimony is not shown'" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

B. Claim Construction

1. Standard of Construction

In an *inter partes* review, the Board interprets claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2018).[5] Nevertheless, "[a] party may request a district court-type claim construction approach to be applied if a party certifies that the involved patent will expire within 18 months from the entry of the Notice of Filing Date Accorded to Petition." *Id.* In this proceeding, we deemed Petitioner's request set forth in the Petition sufficed for us to conditionally grant the request, which was perfected in the absence of opposition by Patent Owner within the specified time period for such. *See* Paper 6.

In applying a district court-type claim construction, we are guided by the principle that the words of a claim "are generally given their ordinary and customary meaning," as understood by a person of ordinary skill in the

[5] The broadest reasonable construction standard applies to *inter partes* review petitions filed before November 13, 2018. 77 Fed. Reg. 48727 (Aug. 14, 2012) (codified at 37 C.F.R. § 42.100(b)), as amended at 81 Fed. Reg. 18766 (Apr. 1, 2016); *see also* 83 Fed. Reg. 51340 (Oct. 11, 2018) (changing the standard for interpreting claims in *inter partes* review petitions filed on or after November 13, 2018).

art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc) (citation omitted). "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). There is a "heavy presumption," however, that a claim term carries its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citation omitted).

We are also guided by the principle that we only construe claim terms if, and to the extent, it is necessary for the purpose of the proceeding, here, to determine whether to institute an *inter partes* review. *See, e.g.*, *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) ("[C]laim terms need only be construed '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)).

2. Petitioner's Proposed Constructions

Petitioner proposes constructions for a number of claim terms. In the following discussion, we address only the claim terms that we determine are necessary for this institution decision.

a. "central computing site" and "central facility"

Petitioner argues that the terms "central computing site" and "central facility" would mean a "single physical location distinct from monitors" and that this "is consistent with the specification." Pet. 13–14 (citing Ex. 1002, 3:35–36, 4:8–11, 4:17–26; 7:10–52, Fig. 3). The cited portions of the

Specification are generally consistent with Petitioner's position. *Phillips*, 415 F.3d at 1315 ("[T]he specification 'is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.'").

Accordingly, on this record, to the extent necessary and for purposes of this decision, we adopt Petitioner's proposed constructions of these terms.

b. "remote," "remotely," and "in proximity of/to"

Petitioner argues that the terms "remote," "remotely," and "in proximity of/to" indicate, as to a monitor in relation to a power line, means "in the vicinity of a power line, but also where someone does not need to climb a power line tower, or have access to a power line facility." Pet. 14–15 (citing Ex. 1002, 12:31–33, 14:27–30); *see also id.* at 8–10 (citing Ex. 1010, 73–75, 56–58, 42–44, 22–26). The '000 patent informs that in "[t]he present invention . . . [the] apparatus . . . may be located a distance from a transmission line . . . to measure remotely the current or power flow." Ex. 1002, 5:2–5; *see also id.* at 7:5–10. The '000 patent also refers more precisely to sensor locations that are in the vicinity of, but not in contact with, lines. *See, e.g.*, *id.* at 12:19–25, 12:33–36.[6]

On this record, for the purpose of this decision, we determine that the terms require the monitor to be physically separated from the electrical line

[6] We note that claims 9 and 11 also include the term "remote" / "remotely" in the context of indicating the location of an "end user" to whom information relating to current in an electrical line is provided or to whom the real-time information is relayed. We do not understand Petitioner's proposed claim construction to apply to these portions of the claims. *See* Pet. 14–15 (discussing proposed construction only with respect to monitor location relative to the power lines).

or plurality of electrical lines, that is, in neither direct nor indirect physical contact.

c. “apparatus”

Petitioner argues a person of ordinary skill in the art “would have understood [‘apparatus’] to mean ‘monitor’” and that a “monitor” is “not a ‘system’ but a device” that is “equipped to measure magnetic and electrical fields emanating from an overhead power line.” Pet. 15. Petitioner also argues that “[t]his construction is consistent with the ’000 patent’s specification.” *Id.* (citing Ex. 1002, 2:23–24, 2:30–33, 5:34–39, 5:44–48, 5:50-53, 5:59–61, 6:58–63, 7:2–5, 8:2–6, 14:32–36, 16:15–16, 16:18, 16:20, 19:42).

The claims reciting an apparatus—claims 1 and 11—indicate that it is placed “in proximity [to/of]” electrical line(s) and that data about the electrical line(s) is transmitted to a “central facility” and an “end-user”—claim 1—or to a “remote end user”—claim 11. Thus, for the purposes of this decision, we determine that the “apparatus” does not encompass the entire system for measuring fields, computing signals, and reporting these to an end user, but only the device place placed in proximity to the electrical line(s). Further, as expressly recited, the “apparatus” of claim 1 includes “a magnetic transducer and an electric transducer” and is equipped to “receiv[e] electric and magnetic fields of [an] electrical line.” Similarly, the “apparatus” of claim 11 expressly includes “a magnetic transducer” and is equipped to “receiv[e] magnetic field emanating from [an] electrical line” and to “receiv[e] an electrical signal synchronized to power system frequency.”

d. "converting magnetic field" and "magnetically transduced signals"

Petitioner contends that a person of ordinary skill in the art "would have understood 'converting magnetic field' to mean 'causing a change from a magnetic field to an electrical signal of a magnetic field' and 'magnetically transduced signals' to mean 'electrical signals derived from measurable magnetic fields.'" Pet. 15–16. Petitioner argues that these constructions are consistent with the '000 patent, including its "describe[d] use of a 'transducer' to measure and convert the magnetic field into a 'transduced signal'" where, referring to a dictionary definition, "[a] transducer 'converts a physical quantity [magnetic field] into an electrical signal.'" *Id.* at 16 (citing Ex. 1002, 2:60–63, 3:52–56, 4:18–24, 7:10–13, 10:5–19, 16:15–25, Figs. 3, 7; Ex. 1014, 8).

On this record, for the purposes of this decision, we determine that the phrase "converting magnetic field" includes the conversion of "a magnetic field to an electrical signal" and "magnetically transduced signals" includes electrical signals derived from measurable, and measured, magnetic fields.

e. "electrical signal synchronized to power system frequency"

Petitioner contends that a person of ordinary skill in the art "would have understood this term to mean 'electrical signal processed from an electric field, which signal has the same frequency as the power system.'" Pet. 16. Petitioner contends that "[t]he 'synchronization' recited . . . refers to detecting and using an electrical 'signal synchronized to the power system frequency'" and that this, "according to the specification, is the frequency of the oscillations of alternating current in an electric power grid." *Id.* at 16–17 (citing Ex. 1002, Abstract, 2:33–34, 7:65–8:33, Fig. 2).

On this record, including the plain meaning of the claim terms, for the purposes of this decision, we determine that an "electrical signal synchronized to power system frequency" includes an electrical signal having the same frequency as the power system.

f. "reference signal"

Petitioner contends that a person of ordinary skill in the art "would have understood this term to mean 'electrical signal processed from an electric field.'" Pet. 17. Petitioner relies on the '000 patent disclosing that its "'monitors' 13 and 14 . . . include 'an electric transducer to convert ***the electric field*** of the [electrical] line at the remote location ***into a reference signal***." *Id.* (citing Ex. 1002, 3:64–66, 7:16–19, 8:22–32, 12:30–36). Petitioner also relies on disclosure of an exemplary monitor and recorded phase angle data as informing the meaning of the phrase. *Id.* at 17–18 (citing Ex. 1002, 17:35–18:4, 20:4–20, Figs. 2, 7).

On this record, for the purposes of this decision, we determine that a "reference signal" includes electrical signals obtained by processing of the electric field.

g. "measuring phase angle"

Petitioner contends that a person of ordinary skill in the art "would have understood this term to mean 'counting a time difference between voltage rises of two analog sinusoidal signals.'" Pet. 18. Petitioner argues that "the '000 patent describes a specific method for calculating a phase angle from signals received from the electric field transducer and magnetic field transducer." *Id.* (citing Ex. 1002, 18:6–18).

On this record, for the purposes of this decision, we determine that "measuring phase angle" includes at least the specific method cited by Petitioner.

We determine no other terms require express construction at this time. *Wellman, Inc.*, 642 F.3d at 1361.

C. Overview of Prior Art

1. Libove (Ex. 1003)

Libove is titled "Apparatus for Measuring Voltages and Currents Using Non-Contacting Sensors" and discloses "[a]n apparatus for performing non-contacting measurements of the voltage, current and power levels of conductive elements such as wires, cables and the like." Ex. 1003, [54], Abstract. Libove discloses "[a] non-contacting voltage measurement system . . . includ[ing] an arrangement of capacitive sensors for generating a first current in response to variation in voltage of a conductive element" (*id.* at 2:2–6) and a non-contacting current measurement system "wherein the composite current [through the conductor] induces a measurement current to flow within a set of coils positioned in a predetermined manner proximate to the conductor" (*id.* at 2:17–20). Libove further discloses that "the measurements of both voltage and current can be combined in one instrument [with] two sensors, one for voltage and one for current act[ing] independently of each other." *Id.* at 14:18–21. Libove also discloses that voltage and current "parameters can be sensed, scaled, subjected to rectification, and then transmitted to a meter, a computer, a recording instrument or a control system." *Id.* at 14:23–26. Libove also discloses that "[i]n the case of complex cables and multi-phase currents the electric and magnetic configurations are such that a microcomputer integrated circuit chip can sort the electric and magnetic fields out and attribute the correct value to each conductor." *Id.* at 4:54–58.

2. Blatt (Ex. 1004)

Blatt is titled "Monitoring and Fault Protection of High Voltage Switch Yards" and discloses the use of magnetic field sensors located a safe distance away from high voltage conductors to monitor currents flowing through the conductors. Ex. 1004, [54], Abstract. Blatt further discloses a control center including a central control computer that is connected to radially remote stations near the magnetic field sensors. *Id.* at 2:3–5, 2:10–11, 2:17–20, 3:25–27, 3:36–37.

3. Fernandes (Ex. 1005)

Fernandes is titled "Electrical Power Line Parameter Measurement Apparatus and Systems, Including Compact Line-Mounted Modules" and discloses sensor modules for mounting directly upon electrical power lines and measuring both voltage and current on the associated conductor, and determining their phase relationships. Ex. 1005, [54], Abstract, 2:45–46, 4:38–40. Fernandes further discloses transmission of sampled values from the sensors to ground stations, which include a microprocessor for calculations, and transmission of "[t]he data . . . to a central data receiving and control facility." *Id.* at 5:15–21.

4. IEEE Std 644-1994 (Ex. 1006)

IEEE Std 644-1994 discloses "[u]niform procedures for the measurement of . . . electric and magnetic fields from alternating current (ac) overhead power lines." Ex. 1006, i. IEEE Std 644-1994 further discloses the lateral profile of the electrical field for multiple lines (Fig. 7), as well as details of the necessary measurements, including how many—at least five under the conductors—and where they should be taken—"at 1 m above the ground" and equally spaced "to a lateral distance of at least 30 m (100 ft) beyond the outside conductor." *Id.* at 14. IEEE Std 644-1994 also discloses a procedure for measuring the magnetic field near power lines, including to "measure[] at a height of 1 m above ground level." *Id.* at 21.

D. Ground 1 – Obviousness over Libove in view of Blatt and Fernandes

Petitioner asserts that claims 1, 9, and 11 are unpatentable as obvious over Libove in view of Blatt and Fernandes. Pet. 21–49. Petitioner relies on Libove "teach[ing] virtually all of the elements and features recited in the challenged claim[s]." *Id.* at 21. Petitioner relies on Blatt as supporting the obviousness of "positioning the monitor at a location that is 'remote to'/'not connected to'/'in proximity to/of' the transmission line" and "transmitting the processed data from the monitor to a central control site" to the extent that the Board determines that Libove does not teach these features. *Id.* (citing Ex. 1004, 1:35–41, 3:29–44, 4:45–56, 5:32–45; Ex. 1007 ¶¶ 97–99, 122–125). Petitioner relies on Fernandes for supporting the obviousness of "transmitting," including "transmitting 'real-time information'/'electrical power dynamics'/'information relating to current in the line' to an 'end user.'" *Id.* at 21–22 (citing Ex. 1005, 1:67–2:3, 5:19–23, 11:33–41; Ex. 1007 ¶¶ 78–83).

Petitioner contends that "Libove, Blatt and Fernandes are all generally directed to systems and methods for measuring fields around a conductor, such as a power transmission line" and that they "share common goals, such as doing so while avoiding contact with the conductors" and "measuring power transmission line information, and providing it to central stations so they can control the power systems in response to the measured data."

Pet. 23, 26; *see also id.* at 22–26 (discussing reasons to combine). Petitioner highlights the similarity of the disclosed systems of Libove, Blatt, and Fernandes. *Id.* at 22–26. Petitioner also highlights the disclosed benefits of obtaining the voltage, current, power, and power factor data, particularly of obtaining it without a need to contact the power lines, and transmitting this data to a central location, as well as the benefits of transmitting information from the central location to an end user. *Id.* Petitioner contends that a person of ordinary skill in the art would have found it obvious to apply Blatt's teaching to make measurements from a safe distance and to transmit measurement data to a central control computer and Fernandes' teaching to use a central control computer to transmit control information to a substation to the power measuring apparatus of Libove. *Id.*

On this record, Petitioner has sufficiently established that Libove, Blatt, and Fernandes are analogous art to the '000 patent, particularly in view of Dr. Olsen's unrebutted testimony. Further discussion of the obviousness of the combination follows.

Petitioner identifies what it contends are corresponding limitations of claims 1, 9, and 11, and sets these forth in a chart, reproduced below.

	Claim 1	Claim 9	Claim 11
[Pre]	A method for measuring electrical power dynamics of a facility, comprising:	A method for remotely delivering real-time information regarding operational status of a power system, said method comprising:	A method for providing information relating to current in an electrical line to a remote end user, comprising

	Claim 1	Claim 9	Claim 11
[A]	placing at least one apparatus comprising a magnetic transducer and an electric transducer in proximity to and not connected to at least one electrical line connected to the facility;	converting magnetic field of current at a location remote to a plurality of electrical lines of said power system into magnetically transduced signals;	placing an apparatus comprising a magnetic transducer in proximity of and not connected to said electrical line;
[B]	receiving electric and magnetic fields of said at least one electrical line with said at least one apparatus;	conditioning said magnetically transduced signals into conditioned magnetically transduced signals;	receiving magnetic field emanating from said electrical line with said magnetic transducer;
[C]		conditioning a reference signal for each of said conditioned magnetically transduced signals into conditioned reference signals;	receiving an electrical signal synchronized to power system frequency with said apparatus;
[D1]	processing said electric and magnetic fields to obtain information representative of magnitude and	measuring magnitude of each of said conditioned magnetically transduced signals;	

	Claim 1	Claim 9	Claim 11
[D2]	relative phase of said electric and magnetic fields;	measuring a phase angle between respective said conditioned magnetically transduced signals and said conditioned reference signals;	
[E]	transmitting said information to a central computing site;	transmitting said magnitudes and said phase angles to a central facility;	
[F]	determining said electrical power dynamics of said facility from said information at said central computing site; and	determining said real-time information from said magnitudes and said phase angles, at said central facility;	processing said magnetic field and said electrical signal to determine said information relating to said current in the line; and
[G]	relaying data regarding said electrical power dynamics to an end-user.	relaying said real-time information to an end user.	transmitting said information to said remote end user.

Pet. 10–11.

[Pre]–Preambles 1[Pre], 9[Pre], and 11[Pre]

Petitioner contends that Libove teaches that its "system of current determination . . . is very helpful since the current monitoring values can be telemetered to the generating or sub-station to provide control information which can be utilized for energy conservation." Pet. 27 (citing Ex. 1003, 4:57–65, 8:45–54). As to claim 1, Petitioner relies on Libove for disclosing the measuring of electrical power dynamics as recited in 1[Pre] in its "teach[ing] [of] a 'system of current determination' and telemetering 'current monitoring values.'" *Id.* (citing Ex. 1002, 15:16–17; Ex. 1003, 8:45–50, 21:53–56). As to claim 9, Petitioner relies on Libove for disclosing "a method for remotely delivering real-time information regarding operational status of a power system, as recited in 9[Pre]." *Id.* (citing Ex. 1003, 21:53–56). As to claim 11, Petitioner relies on Libove for disclosing "a method for providing information relating to current in an electrical line to a remote end user, as recited in 11[Pre]," including "an 'electrical line'" that is "a set of at least three conductors operated in a poly-phase arrangement." *Id.* at 27–28 (citing Ex. 1003, 4:52–58, 5:37–38, 7:21–22; Ex. 1007 ¶ 88).

On this record, we find Petitioner has sufficiently established that Libove teaches or suggests 1[Pre], 9[Pre], and 11[Pre] at this stage of the proceeding. Accordingly, we need not determine whether the preambles are limiting in reaching our decision to institute *inter partes* review.

Likewise, we need not determine the precise meaning of "electrical line" at this time, because there is a sufficient basis for the monitoring of "a set of at least three conductors operated in a poly-phase arrangement," as well as for a single conducting wire. *Wellman, Inc.*, 642 F.3d at 1361. We note, however, that the '000 patent does indicate that "the terms 'transmission line' and 'electrical line' will generally refer to a set of at least three conductors operated in a poly-phase arrangement for the purpose of transmitting electric energy" (Ex. 1002, 2:8–11) and that these are contrasted with "'[b]undled' conductors, which consist of multiple wires in close proximity . . operated electrically in parallel, [which] will be referred to and treated as a single conductor" (*id.* at 2:15–18).

[A]–Limitations 1[A], 9[A], and 11[A]

Petitioner contends that Libove in view of Blatt teaches limitations 1[A], 9[A], and 11[A] in claims 1, 9, and 11. Pet. 28–31.

Petitioner relies on Libove teaching an apparatus that includes a magnetic transducer and an electric transducer, as well as "an 'integrated chip' for processing voltage waveforms and current waveforms . . . determined based on signals sensed and combined from the [apparatus'] electric and magnetic field sensors." *Id.* at 28 (citing Ex. 1003, 12:16–27, 12:38–42, 14:21–23). Petitioner contends that a person of ordinary skill in the art "would have also understood that the apparatus of Libove is a monitor equipped to receive a magnetic field and an electrical signal." *Id.* Petitioner further relies on Libove for disclosing that its electric and magnetic field sensors output electrical signals reflecting the strength of the fields sensed by the sensors, and that approximated waveforms can be obtained by use of the microcomputer and integrated circuit, with particular emphasis on the magnetic field. *Id.* at 28–29 (citing Ex. 1003, 4:9–17, 4:52–58, 5:14–21, 5:22–25, 5:37–38, 7:21–22). Petitioner relies on the electrical signals outputted as meeting the recited "magnetically transduced signal" of 9[A].[7] *Id.* at 15–16, 28–29.

Petitioner relies on Libove disclosing that the monitors are "in proximity to," but "not connected to," or are "remote" to the electrical line(s) being monitored. *Id.* at 29–31. Petitioner argues that "Libove teaches that these monitors measure the voltage, current, and power of

[7] We note that unlike 1[A] and 11[A], which are limited to placement of an apparatus, 9[A] recites "converting [the] magnetic field . . . into magnetically transduced signals."

power lines without making contact with bare wires or the voltage sources (*i.e.*, transmission lines)." *Id.* at 29 (citing Ex. 1003, 4:17–23). Petitioner further relies on Libove disclosing that "[b]y placing the monitor in the 'vicinity' of a power line, voltage, current, and power measurements can be made without having to make direct contact with the bare transmission line." *Id.* at 29–30 (citing Ex. 1003, 4:17–23, 4:41–44, 11:49–55). Petitioner's expert Dr. Olsen testifies that a person of ordinary skill in the art "would have understood that placing a monitor in the 'vicinities' . . . would not require an installer to scale the power line or have physical access to the power line facility." *Id.* at 30 (citing Ex. 1007 ¶ 92). Petitioner and Dr. Olsen also rely on Libove's "teach[ing] that its monitors can be positioned to give sufficient warning to helicopter pilots and avoid colliding with a power line" as supporting a person of ordinary skill in the art recognizing Libove's "monitors could be placed at . . . distances [that] would be 'remote to' . . . and 'in proximity to/of' and 'not connected to' the power transmission lines." *Id.* (citing Ex. 1003, 25:9–13; Ex. 1007 ¶ 95).

Petitioner also relies on Blatt as teaching that such monitors for monitoring power lines can be "positioned 'in proximity to/of' and 'not connected to' the power line[s]" in that it discloses use of magnetic field transducers positioned at a distance from power transmission lines to "measure the magnetic fields of transmission lines from 'safe working distances.'" *Id.* at 31 (citing Ex. 1004, 1:35–41, 1:45–53). Petitioner argues that a person of ordinary skill in the art would have been motivated to position the monitors remote from the power lines for the benefit of a "'safe-working' environment." *Id.* at 32.

On this record, we find Petitioner has sufficiently established that Libove in view of Blatt teaches or suggests 1[A], 9[A], and 11[A] at this stage of the proceeding.

In reaching our decision, we need not precisely define the distance between the sensors and the power line(s) in the manner set forth by Petitioner, but determine only that the sensors and power line(s) are not in contact, either directly or indirectly, as the prior art teaches sensors separated from power lines(s), but sufficiently close to allow measurement of electric field and magnetic field. This determination is consistent with Dr. Olsen's unrebutted testimony that a person of ordinary skill in the art would have understood from Libove that placement of monitors "would not require an installer to scale the power line or have physical access to the power line facility" (Ex. 1007 ¶ 92) and that a person of ordinary skill in the art would have separated the monitors from the power line to "create a 'safe-working' environment" (*id.* at ¶¶ 98–99), as relied on by Petitioner (Pet. 30–32).

[B]–Limitations 1[B], 9[B], and 11[B]

Petitioner contends that Libove teaches limitations 1[B], 9[B], and 11[B] in claims 1, 9, and 11. Pet. 32–34. Limitation 1[B] recites "receiving electric and magnetic fields" and 11[B] similarly recites "receiving magnetic field." Limitation 9[B] differs, however, in that it recites "conditioning" the signals generated in 9[A].

As to 1[B] and 11[B], Petitioner relies on Libove disclosing magnetic field sensors for measuring the magnetic field associated with a transmission line, which receive (detect) a magnetic field emanating from the power line (*id.* at 32–33 (citing Ex. 1003, 3:57–63, 4:9–17, 4:41–44)). As to 1[B], Petitioner further relies on "Libove also disclos[ing] electric field sensors for measuring the electric field associated with a transmission line" and that "its monitors can combine the magnetic field and electric field sensors to measure power." *Id.* at 34 (citing Ex. 1003, 12:16–27; Ex. 1007 ¶ 105).

As to 9[B], Petitioner relies on Libove teaching that the transduced signal is amplified and rectified (*id.* at 33 (citing Ex. 1003, 5:31–34, 6:21–24, 14:24–27)) and argues that this constitutes "conditioning" within the meaning of the '000 patent (*id.* (citing Ex. 1002, 3:56–4:1, 7:10–17, 16:42–17:3, 17:57–18:5, Fig. 7)).

Petitioner also relies on Libove for teaching its device's application to "complex cables and multi-phase currents" and argues that a person of ordinary skill in the art "would have understood that the disclosure of multi-phase currents in Libove includes three conductors that operated in poly-phase arrangement." *Id.* at 33–34 (citing Ex. 1003, 4:52–58, 5:37–38, 7:21–22; Ex. 1007 ¶ 104).

On this record, we find Petitioner has sufficiently established that Libove meets limitations 1[B], 9[B], and 11[B], including that it discloses monitors including both a magnetic field sensor and an electric field sensor, the "conditioning" of signals within the meaning of the '000 patent, and the application of its devices and methods to a set of three conductors that operate in a poly-phase arrangement.

[C]–Limitations 9[C] and 11[C]

Petitioner contends that Libove teaches limitations 9[C] and 11[C] in claims 9 and 11, which recite "conditioning a reference signal . . . into conditioned reference signals" and "receiving an electrical signal synchronized to power system frequency with said apparatus," respectively. Pet. 34–36.

Petitioner relies on Libove "teach[ing] that the electric field sensors can be used to measure the electric field about the transmission lines" and "that the voltage signal sensed from the electric field sensor (*i.e.*, the transduced electric field) is in phase and capacitively coupled to the voltage of the power line being sense[d]." *Id.* at 34–35 (citing Ex. 1003, 4:1–5, 10:35–39, 13:6–8, 13:31–34). Petitioner relies on Dr. Olsen's testimony indicating that electric field sensors and their use was well known to measure the electric field of power lines and that "[a] person of ordinary skill in the art would have known that the sensed a.c. voltage described in Libove would be at the same frequency as the signal in the power line." *Id.*; Ex. 1007 ¶¶ 106–108. Petitioner also relies on Dr. Olsen's testimony that Libove teaches "that the power in suspended wire systems can be measured by placing the electric field and magnetic field sensors in the vicinity of the wires, and calculating the phase difference between the voltage and current waveforms." Pet. 35 (citing Ex. 1003, 11:49–62); Ex. 1007 ¶ 107.

As to claim 9, Petitioner relies on Dr. Olsen's testimony that a person of ordinary skill in the art "would have understood that the voltage waveform created by the electric field sensor is a reference signal as recited . . . because it is in phase and has the same frequency as the signals on the power line, and is used to determine power of the power line." Pet. 35 (citing Ex. 1007 ¶ 108). Petitioner relies on Libove "teach[ing] that the transduced electric field signal is scaled and rectified" and that a person of ordinary skill in the art would have understood Libove to teach that the reference signal is conditioned. *Id.* at 36 (citing Ex. 1003, 11:34–35, 14:22–27; Ex. 1007 ¶ 110). As to claim 11, Petitioner relies on Dr. Olsen's testimony, mirroring that for claim 9, that "the voltage waveform is synchronized to the power system frequency." *Id.* at 35 (citing Ex. 1007 ¶ 109).

On this record, we find Petitioner has sufficiently established that Libove meets limitations 9[C] and 11[C], particularly in light of Dr. Olsen's unrebutted testimony, including his explanation that, in view of our preliminary construction of the claim terms "electrical signal synchronized to power system frequency" and "reference signal" (Ex. 1007 ¶¶ 60–62), a person of ordinary skill in the art would have understood that Libove discloses those elements (*id.* at ¶¶ 107–110).

[D1] and [D2]–Limitations 1[D1] & 1[D2] and 9[D1] & 9[D2]

Petitioner contends that Libove teaches limitations 1[D1] and 1[D2] in claim 1 and limitations 9[D1] and 9[D2] in claim 9. Pet. 36–39. Claim 1 recites "processing said electric and magnetic fields to obtain information representative of magnitude and relative phase of said electric and magnetic fields." Claim 9 recites "measuring magnitude of each of said conditioned magnetically transduced signals; measuring a phase angle between respective said conditioned magnetically transduced signals and said conditioned reference signals." In effect, [D1] in each claim sets forth obtaining magnitude information for signals and [D2] relative phase angle information between the electric and magnetic fields.

Petitioner relies on "Libove teach[ing] that its apparatus senses both magnetic fields and electric fields of the transmission line" and that "[c]ombining voltage and current measurements enables the measurement of power consumed by loads connected to the wire" (*id.* at 36 (citing Ex. 1003, 12:16–27)), including "calculat[ing] the power" by using "[t]he phase angle between the voltage and current waveforms" (*id.* at 38 (citing Ex. 1003, 11:54–61, 12:38–42, 21:44–46; Ex. 1007 ¶ 116)).

As to the magnetic field, and magnetic field signals, Petitioner relies on Libove disclosing magnetic field sensors that output signals and that these are used to calculate a root-mean-square of the current waveform and contends that a person of ordinary skill in the art would have "understood that the magnetic field sensor outputs . . . data representative of the magnitude of the magnetic field." *Id.* at 36–37 (citing Ex. 1003, 5:14–31, 6:52–55, 10:19–21, 10:35–46; Ex. 1007 ¶ 113). As to monitoring multiple wires, Petitioner further relies on "Libove teach[ing] that the microcomputer integrated circuit sorts the magnetic fields from multiple wires and uses superposition to approximate the waveforms of the signals." *Id.* at 37 (citing Ex. 1003, 4:52–58, 5:37–38, 7:21–22).

As to the electric field, and electric field signals, Petitioner relies on Libove disclosing electric field sensors to obtain electric field signals, including magnitudes directly proportional to the voltage level of the wires. *Id.* (citing Ex. 1003, 10:19–21, 10:35–46). Petitioner also relies on Libove disclosing the use of these magnitudes to calculate "a root-mean-square of the voltage and the measurement of peak values of wire voltages" and that a person of ordinary skill in the art would have "understood that the electric field sensor outputs . . . data representative of the magnitude of the electric field." *Id.* at 37–38 (citing Ex. 1003, 10:19–21, 11:36–40, 18:31–40; Ex. 1007 ¶ 115).

As to relative phase information, Petitioner relies on Libove disclosing "generat[ing] relative phase information from the transduced magnetic field and electric field analog signals using an 'integrated chip' that determines the phase angle between the voltage wave and the current wave," as well as the use of "[t]he phase angle between the voltage and current waveforms . . . [to] calculate the power." *Id.* at 38 (citing Ex. 1003, 11:54–61, 12:38–43, 21:44–46; Ex. 1007 ¶ 116). Petitioner further relies on "Libove teach[ing] that the phase angle can be calculated . . . as the difference between the voltage and current waveforms" and as providing a particular method of measuring the phase angle "by 'counting a time difference between [the] voltage rises of two analog sinusoidal signals.'" *Id.* at 38–39 (citing Ex. 1003, 12:39–42, 13:47–14:10; Ex. 1007 ¶ 117). Petitioner also contends that "[t]he voltage waveform corresponding to the transduced electric field is a conditioned reference signal because it is in phase and at the same frequency as the signals on the power lines." *Id.* at 39 (citing Ex. 1003, 11:34–35, 14:22–27); *see also id.* at 35 (citing Ex. 1007 ¶ 108).

On this record, we find Petitioner has sufficiently established that Libove meets limitations 1[D1], 1[D2], 9[D1], and 9[D2], particularly in light of Dr. Olsen's unrebutted testimony, including how a person of ordinary skill in the art would have understood Libove's disclosure relating to the phase angle between the voltage and current waveforms, i.e., relative phase of the electric and magnetic fields, and computation of the power factor. Ex. 1007 ¶¶ 113, 115–117.

[E]–Limitations 1[E] and 9[E]

Petitioner contends that Libove in view of Blatt teaches limitation 1[E] and 9[E] of claims 1 and 9. Pet. 39–46.

As to "transmitting said information to a central computing site" (claim 1), Petitioner relies on Libove teaching "that each parameter sensed and processed by the monitor is 'transmitted to a meter, a computer, a recording instrument or a control system.'" *Id.* at 39 (citing Ex. 1003, 14:23–27). As to "multi-wire/multi-phase cables," Petitioner relies on "Libove teach[ing] that, after 'the current flow of each wire in the array is completely determined, [] the output values 504 can be recorded, telemetered, or otherwise transmitted to the person or system in control.'" *Id.* (citing Ex. 1003, 7:51–8:9). Petitioner also contends that "[t]elemetering these monitored values to a central control station makes Libove's techniques particularly suitable for monitoring transmission lines." *Id.* at 39–40 (citing Ex. 1003, 8:45–50).

Petitioner relies on Blatt for "expressly teach[ing] that its 'remote stations are also ***connected radially*** back to a ***central control computer***'" at "a single physical location" and contends that "the claimed 'central computing site,' . . . would have been obvious" where "[t]he central control computer of Blatt receives transmission data from remote stations." *Id.* at 40–41 (citing Ex. 1004, 3:36–38, 3:41–44, 5:32–45; Ex. 1007 ¶ 122). Petitioner further relies on Blatt "explain[ing] that the data transmissions received by the central control computer are recorded, stored, and displayed on an operator console." *Id.* at 41 (Ex. 1004, 3:29–31, 4:45–56, 10:16–19; Ex. 1007 ¶ 123).

Petitioner contends that a person of ordinary skill in the art would have been motivated to connect the apparatus of Libove to a central control computer in order to "allow the voltage and current measurements to be recorded and viewed from a central operator console . . . . enabl[ing] the central computer to detect faults in the power transmission system." *Id.* at 41–42 (citing Ex. 1007 ¶ 124). Petitioner further contends that combining

Libove's monitoring apparatus and Blatt's central control computer would have "us[ed] well-known computer transmission and networking techniques, to achieve a predictable result." *Id.* at 43 (citing Ex. 1007 ¶ 127).

As to "transmitting said magnitudes and said phase angles to a central facility" (claim 9), Petitioner relies on Libove as teach[ing] the identical function recited in 1[E] and 9[E], . . . transmitting the data to the central computing site/facility." *Id.* Petitioner and Dr. Olsen further support this in contending that a person of ordinary skill in the art "would have also understood that *the apparatus telemetering the magnitude and relative phase data of the respective magnetic and electric fields to the central computing site* (*e.g.*, *Libove's central computer/system/station*) teaches the same structure." *Id.* at 44 (citing Ex. 1003, 8:45–50; Ex. 1007 ¶ 130) (emphasis added). As above, Petitioner also relies on Blatt for its "disclosure of remote stations radially connected back to 'a central control computer'" and "'transmitting' the data to its central computing site." *Id.* (citing Ex. 1004, 3:36–38; 6:18–20; Ex. 1007 ¶ 131). Petitioner further contends that a person of ordinary skill in the art "would have readily understood that the magnetic and electric field data . . . could be transmitted to a central control site" and "that measured data includes the magnitudes and phase angles as recited in 9[E], because Libove teaches that '***each*** of these parameters can be sensed . . . and then transmitted.'" *Id.* at 45–46 (citing Ex. 1003, 14:24–27); *see* Ex. 1007 ¶¶ 132–134.

On this record, Petitioner has sufficiently established that Libove in view of Blatt renders obvious the limitations "transmitting said information [representative of magnitude and relative phase of said electric and magnetic fields] to a central computing site"—set forth in claim 1—and "transmitting said magnitudes and said phase angles to a central facility"—set forth in claim 9—at this stage of the proceeding. We find, in particular, that Petitioner's unrebutted contentions and Dr. Olsen's unrebutted testimony reasonably support both the obviousness of (i) transmitting the magnitude and relative phase data of the respective magnetic and electric fields and (ii) transmitting current, voltage, and power information calculated from the magnitude and relative phase data. Such current, voltage, and power information is, likewise, reasonably established to be information representative of magnitude and relative phase of electric and magnetic fields at this stage of the proceeding, particularly in light of Dr. Olsen's unrebutted testimony, including his discussion as to the relation of relative phase to calculating a power factor. Ex. 1007 ¶¶ 113, 115–116.

[F]–Limitations 1[F], 9[F], and 11[F]

Petitioner contends that Libove in view of Blatt teaches limitations 1[F], 9[F], and 11[F] in claims 1, 9, and 11. Pet. 46–47. As discussed above, Petitioner relies on the combination of Libove and Blatt for the transmitting of magnetic and electric field data to a central control computer. Petitioner further relies on "Blatt teach[ing] that its control center processes the signals it receives from remote stations to 'calculate the currents flowing through the conductors of the network,' as well as power." *Id.* at 46 (citing Ex. 1004, 2:17–20, 3:29–31, 3:64–4:9). Petitioner also relies on the testimony of Dr. Olsen as supporting "Blatt teach[ing] [that] the 'electrical power dynamics and 'real-time information' are determined at the central computing site/facility as recited in 1[F], 9[F], and 11[F]" (*id.* (citing Ex. 1007 ¶ 136)), as well as a person of ordinary skill in the art being motivated to combine the teachings of Libove and Blatt (*id.* at 46–47 (citing

Ex. 1007 ¶¶ 137–138)). Petitioner also contends that a person of ordinary skill in the art "would have understood that instantaneous power calculations that are performed at the central computer of Blatt could calculate net current and calculate power in the same way as described by Libove," namely, "based on the voltage, current, and phase angle measured by the monitors." *Id.* at 47 (citing Ex. 1003, 11:54–61; Ex. 1004, 4:6–9, 8:64–66; Ex. 1007 ¶ 138).

On this record, Petitioner has sufficiently established limitation [F] for claims 1, 9, and 11, particularly as supported by the unrebutted testimony of Dr. Olsen. As discussed above in regard to limitation [E], the record reasonably supports the obviousness of transmitting both types of information to the central facility if there is a discrepancy between the information transmitted to a central facility in claim 1 and claims 9 and 11. Likewise, the record also reasonably supports the obviousness of both "determining said electrical power dynamics from [information representative of magnitude and relative phase of said electric and magnetic fields] at said central computing site" (claim 1) and the determinations grounded on "said magnitudes and said phase angles" (claim 9) and "said magnetic field and said electrical signal" (claim 11).

[G]–Limitations 1[G], 9[G], and 11[G]

Petitioner contends that Libove in view of Blatt and Fernandes teaches limitations 1[G], 9[G], and 11[G] of claims 1, 9, and 11. Pet. 47–50. Petitioner relies on the combination of Libove and Blatt for the power calculations of Libove being "performed at the central computing site/facility," as discussed above. *Id.* at 47. Petitioner relies on Fernandes for the further limitation "that the calculations and other information determined at the central computing site/facility are transmitted or relayed to an end user." *Id.* at 48.

Petitioner relies on Fernandes disclosing a Supervisory Control and Data Acquisition (SCADA) system in which "sensors transmit data relating to transmission lines to a central computer (*i.e.*, a 'master computer')," that the "central computer will then analyze the data and make decisions," and that a "system receiver can be employed at a power substation to receive information from a 'master computer.'" *Id.* (citing Ex. 1005, 11:33–41; Ex. 1007 ¶ 139). Petitioner contends that information transmitted from the SCADA central computer to the system receiver at a substation includes "alarms and control signal inputs." *Id.* at 48–49 (citing Ex. 1005, 11:33–41, 12:3–25; Ex. 1007 ¶ 140). Petitioner further contends that a person of ordinary skill in the art "would have further understood that the central computing site/facility in Blatt could operate as a SCADA central computer . . . that communicates with the SCADA system receiver." *Id.* at 49 (citing Ex. 1005, 11:33–41, 12:3–25; Ex. 1007 ¶ 140). Petitioner also contends that a person of ordinary skill in the art "would have understood Fernandes teaches relaying/transmitting data from a central computer (i.e., the SCADA master computer), to an end user (*i.e.*, the SCADA system receiver) as recited in 1[G], 9[G], [and] 11[G]." *Id.* (citing Ex. 1007 ¶ 140).

Petitioner contends that a person of ordinary skill in the art would have been motivated to make the combination set forth in order "to send substations alerts and control signals from the central computing site/facility" because it "would enable the central computer to detect and react to faults in the power transmission system" and that doing so would merely involve combining well-known prior art elements to achieve predictable results. *Id.* at 49–50 (citing Ex. 1003, 8:45–50, 14:23–27; Ex. 1007 ¶¶ 141–142).

On this record, we find Petitioner has sufficiently established that Libove in view of Blatt and Fernandes renders obvious the limitations 1[G], 9[G], and 11[G] at this stage of the proceeding, particularly in light of Dr. Olsen's unrebutted testimony, including his explanation that a person of ordinary skill in the art "would have understood Fernandes teaches relaying/transmitting data from a central computer (i.e., the SCADA master computer), to an end user (i.e., the SCADA system receiver) as recited in [the claims]" (Ex. 1007 ¶ 140), and benefits of such an arrangement as to monitoring and controlling a power transmission system (*id.* at ¶¶ 141–142).

Conclusion

On this record, we find Petitioner's unrebutted contentions as to the obviousness of claims 1, 9, and 11 over the combination of Libove, Blatt, and Fernandes reasonably supported as discussed above. Accordingly, we find that there is a reasonable likelihood that Petitioner will be able to establish that claims 1, 9, and 11 are unpatentable over the combination of Libove, Blatt, and Fernandes.

E. Ground 2 – Obviousness over Libove in view of Fernandes and IEEE Std 644-1994

Petitioner asserts that claims 1, 9, and 11 are unpatentable as obvious over Libove in view of Fernandes and IEEE Std 644-1994. Pet. 22, 50–61.

Petitioner contends that "Libove, Fernandes and IEEE Std 644-1994 are all generally directed to systems and methods for measuring fields around a conductor, such as a power transmission line" and that they "share common goals, such as measuring power transmission line information and providing it to central stations so they can control the power systems in response to the measured data." Pet. 51–52. Petitioner contends that a person of ordinary skill in the art would have found it obvious to "apply Fernandes' transmission techniques to the monitoring apparatus of Libove in order to transmit the magnetic and electric field data to a central control facility" and "to apply the uniform measurement techniques of IEEE Std 644-1994 to the apparatus of Libove." *Id.* at 52.

Petitioner relies on its previous discussion that Libove in view of Fernandes teaches limitations [Pre], [B], and [G] of claims 1, 9, and 11; [C] of claims 9 and 11; and [D1], [D2], and [E] of claims 1 and 9. *Id.* at 52–53. For limitations [A], [E], and [F], Petitioner sets forth bases differing from than those of ground 1.

Because we find above that Petitioner has established a reasonable likelihood of prevailing as to ground 1, and thus institute on all grounds raised in the Petition under our *SAS* guidance,[8] we need not decide at this stage whether Petitioner has shown a reasonable likelihood of success with respect to ground 2. We, however, address limitations [A], [E], and [F], as follows:

[A]–Limitations 1[A], 9[A], and 11[A]

Petitioner relies on Libove in view of Fernandes and IEEE Std 644-1994 for limitations [A] recited in claims 1, 9, and 11. Pet. 53–56. Petitioner relies on IEEE Std 644-1994 in the main for its disclosure relating to the placement of a monitors, in particular, for the locations at which to measure "electric and magnetic field strength" relative to multi-wire

[8] *Guidance on the Impact of SAS on AIA Trial Proceedings* (April 26, 2018) (available at https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial).

transmission lines. *Id.* at 53 (citing Ex. 1006, 14–15 (Figs. 7–8)); *id.* at 53–54 (citing Ex. 1006, 14, 22, Fig. 7); *id.* at 55 (Ex. 1006, iii, 1, 13–15, 21–22).

On this record, we find that Petitioner's assertions regarding limitations 1[A], 9[A], and 11[A] appear to be supported and deem them sufficient at this stage of the proceeding.

[E]–Limitations 1[E] and 9[E]

Petitioner relies on "Libove teach[ing] that monitored values can be 'transmitted to a meter, a computer, a recording instrument or a control system,' and 'telemetered to the generating or the sub-station to provide control information which can be utilized for energy conservation.'" Pet. 56 (citing Ex. 1003, 7:51–8:9, 8:45–50, 14:23–27).

Petitioner relies on Fernandes as "providing systems for collecting and transmitting parameters associated with electrical power line operations" and as "teach[ing] that the voltage, current and phase relationship measurements can be transmitted to a central facility." *Id.* at 56–57 (citing Ex. 1005, 1:67–2:3, 5:19–23). Petitioner further relies on Fernandes "describing the control station controlling power supplied to transmission lines in accordance with the measured parameters" and, on this basis, contends that a person of ordinary skill in the art "would have understood that the central facility of Fernandes is situated in a single physical location distinct from the modules because the modules transmit the data via data links . . . , and because the facility is 'central' to the system from where it provides 'control.'" *Id.* at 57 (citing Ex. 1005, 1:35–40, 5:23–28, Abstract; Ex. 1007 ¶ 160). Petitioner also relies on Fernandes' disclosing transmission techniques and equipment for transmitting sensed data. *Id.* at 57–59 (citing Ex. 1005, 3:63–65, 4:43–45, 4:65–5:9, 8:54–57). Petitioner further contends that "it would have been obvious to a [person of ordinary skill in the art] to apply Fernandes' teaching of data links . . . to transmit the transduced electric field and magnetic field signals of Libove to a central computing site." *Id.* at 58.

Petitioner and Dr. Olsen provide less explanation here, than in ground 1, how the combination discloses or suggests "transmitting information representative of magnitude and relative phase of [the] electric and magnetic fields" (claim 1) or "said magnitudes and said phase angles" (claim 9) to a central computing site or facility. *Compare id.* at 56–59, *with id.* at 39–46. While Petitioner relies on Fernandes "teach[ing] that the voltage, current and phase relationship measurements can be transmitted to a central facility using radio, land lines or satellite channels" (*id.* at 57 (citing Ex. 1005, 5:19–23)), the cited text is part of a longer disclosure that "[t]he ground station includes a microprocessor to which signals . . . are supplied for further processing, such as calculation of total circuit and/or substation kilowatts, kilowatt hours, kilovars, etc." (Ex. 1005, 5:15–19) and that "[t]he data is then communicated to a central data . . . facility" (*id.* at 5:19–23). The issue is whether Fernandes' ground station transmits *the original data* or if it transmits the *calculations* for voltage, current, and power *obtained by using the original data* received at the ground station, or transmits both. Elsewhere, Petitioner relies on further disclosure from Fernandes that is not necessarily grounded on the transmission or use of the magnitudes of electric and magnetic fields, and their relative phase angle, particularly transmission to, or use at, a central facility. Pet. 56–59 (Ex. 1005, 1:35–40, 1:67–2:3, 3:63–65, 4:43–45, 4:65–69, 5:23–28, Abstract).

Accordingly, based on the current record, there appears to be relatively less support for limitations 1[E] and 9[E] based on the transmission of electric and magnetic field magnitudes and relative phase angles themselves, rather than on current, voltage, and power information calculated from the magnitude and relative phase data, than for ground 1.

[F]–Limitations 1[F], 9[F], and 11[F]

Petitioner relies on "the power calculations of Fernandes to be 'electrical power dynamics' of a facility as recited in 1[Pre], 'real-time information' as recited in claim 9[Pre], and 'information relating to current in an electrical line' as recited in 11[Pre]." Pet. 60. Petitioner also relies on "Fernandes explain[ing] that prior art systems typically transmitted data to a central control station 'where it was processed and used to assist in control of the power supplied to the various transmission lines . . .'" and that, in its system, "the energy related quantities of interest that are 'processed' include power." *Id.* at 59–60 (citing Ex. 1005, 1:31–40, 5:15–19, 12:40–43). Petitioner then relies on Fernandes as disclosing these "power calculations [being] calculated at the central computer of Fernandes" and relies on that as establishing that "Libove in view of Fernandes teaches the 'electric power dynamics' and 'real-time information' are determined at the central computing site/facility as recited in 1[F] and 9[F]. *Id.* (citing Ex. 1007 ¶ 168).

As discussed above, based on the current record, there appears to be relatively less support for power calculations conducted at the central computer electric and magnetic field magnitudes and relative phase angles than for ground 1.

IV. CONCLUSION

For the foregoing reasons, we are persuaded that the Petition establishes a reasonable likelihood that Petitioner would prevail on its challenge as to at least one of the challenged claims. We, therefore, institute an *inter partes* review of all challenged claims on all asserted grounds.

V. ORDER

For the reasons given, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1, 9, and 11 of the ’000 patent with respect to the grounds set forth in the Petition; and

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 commencing on the entry date of this decision.

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