

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION
(d/b/a WABTEC CORPORATION)
Petitioner,

v.

SIEMENS MOBILITY, INC.
Patent Owner.

Case IPR2017-02044

U.S. Patent No. 6,609,049

PATENT OWNER'S NOTICE OF APPEAL

Notice is hereby given, pursuant to 35 U.S.C. §§ 141(c), 142, and 319, and 37 C.F.R. §§ 90.2(a) and 90.3(a), that Patent Owner Siemens Mobility, Inc. (“Patent Owner”) appeals from the Patent Trial and Appeal Board’s (“PTAB”) Final Written Decision entered on February 4, 2019 (Paper No. 67) in the above-captioned *inter partes* review of U.S. Patent No. 6,609,049 (“’049 patent”) to the United States Court of Appeals for the Federal Circuit. A copy of the Final Written Decision is attached to this notice as Exhibit A. This notice is timely filed within 63 days of the PTAB’s Final Written Decision. 37 C.F.R. § 90.3(a)(1).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner further indicates that the issues on appeal include, without limitation: (i) the PTAB’s determination that claims 1-9 and 11-19 of the ’049 patent are unpatentable over the art of record; (ii) the PTAB’s claim construction of “corresponding regulations”; (iii) the PTAB’s secondary considerations nexus analysis; (iv) the PTAB’s obviousness analysis; (v) the PTAB’s disposition of Patent Owner’s motion to exclude; and (vi) any finding or determination supporting or related to the above-mentioned issues, including in any orders, decisions, rulings, and/or opinions.

Simultaneous with this submission, Patent Owner is filing a true and correct copy of this Notice of Appeal with the Director of the U.S. Patent and Trademark Office and electronically filing the same, along with the required docketing fees,

with the Clerk of the Federal Circuit as set forth in the accompanying Certificate of Filing.

Respectfully submitted,

Dated: April 5, 2019

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CERTIFICATE OF FILING

The undersigned hereby certifies that, in addition to being filed with the PTAB through the PTAB E2E electronic filing system, a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL is being filed with the Director of the U.S. Patent and Trademark Office on April 5, 2019 by hand at the following address:

Office of the General Counsel
United States Patent and Trademark Office
Madison Building East, 10B20
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The undersigned also hereby certifies that a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL and the filing fee is being filed via the electronic filing system, CM/ECF, with the Clerk's Office of the U.S. Court of Appeals for the Federal Circuit on April 5, 2019.

Pursuant to Fed. Cir. R. 15(a)(1), one copy of this Notice of Appeal is also being sent to the Clerk's Office of the Federal Circuit by first class mail on April 5, 2019.

Respectfully submitted,

Dated: April 5, 2019

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Certificate of Service

The undersigned hereby certifies that on April 5, 2019, a true and correct copy of the foregoing was served by email on the following counsel of record for Petitioner:

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EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION
Petitioner,

v.

SIEMENS MOBILITY, INC.,
Patent Owner.

Case IPR2017-02044
Patent 6,609,049 B1

Before KRISTEN L. DROESCH, MEREDITH C. PETRAVICK, and
TIMOTHY J. GOODSON, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a), 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

We have authority to hear this *inter partes* review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine by a preponderance of the evidence that claims 1–9 and 11–19 (“challenged claims”) of U.S. Patent No. 6,609,049 B1 (Ex. 1001, “’049 Patent”) are unpatentable.

B. Procedural History

Westinghouse Air Brake Technologies Corporation (“Petitioner”) filed a Petition (Paper 1, “Pet.”) for *inter partes* review of the challenged claims of the ’049 Patent. *See* 35 U.S.C. §§ 311–312. Siemens Mobility, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 11, “Prelim. Resp.” Pursuant to 35 U.S.C. § 314, we instituted trial on January 31, 2018, as to all of the challenged claims of the ’049 Patent (Paper 12, “Institution Decision” or “Dec.”).

After institution of trial, Patent Owner filed a Response (Paper 20, “PO Resp.”), to which Petitioner filed a Reply (Paper 45, “Reply”).

Petitioner relies on a Declaration of Steven R. Ditmeyer (Ex. 1002) to support its Petition. Patent Owner relies on a Declaration of Nabil Ghaly, Eng. Sc. D. (Ex. 2004) to support its Patent Owner Response. Both witnesses were cross-examined during the trial, and transcripts of their depositions are in the record. Ex. 1015 (Ghaly Deposition); Ex. 2006 (Ditmeyer Deposition).

Petitioner filed a Motion to Exclude Exhibits 2010 and 2011 (Paper 34, “Mot. to Excl.”), to which Patent Owner filed an Opposition (Paper 40, “Opp. Mot. to Excl.”), to which Petitioner filed a Reply (Paper 41).

Patent Owner submitted Supplemental Information (Paper 44, “Supp. Info.”), to which Petitioner filed a Response (Paper 50, “Resp. Supp. Info.”).

Petitioner filed a Motion to Exclude Exhibit 2017 (Paper 56, “2nd Mot. to Excl.”), to which Patent Owner filed an Opposition (Paper 59, “Opp. 2nd Mot. to Excl.”), to which Petitioner filed a Reply (Paper 60).

Oral argument was held on November 13, 2018. A transcript of the oral argument is included in the record. Ex. 2019 (“Tr.”).

C. Related Proceedings

The parties indicate the ’049 Patent is asserted in *Siemens Industry, Inc. v. Westinghouse Air Brake Technologies Corporation*, Case No. 1:16-cv-00284 (D. Del.). See Pet. viii; Paper 8, 1;

Petitioner indicates that the ’049 Patent is related to U.S. Patent No. 6,824,110, for which Petitioner has requested *inter partes* review in Case No. IPR2017-01669. See Paper 8, 1.

D. The ’049 Patent (Ex. 1001)

The ’049 Patent discloses a system and method for automatically activating a train warning device, such as a train horn, at a grade crossing. See Ex. 1001, 1:8–12, 2:47–50. The system includes a control unit, a global positioning system (GPS) receiver, a database of crossing locations in the system, and an electrically activated horn. See *id.* at 2:22–50, Fig. 1. The control unit determines the next crossing based on the train location reported by the GPS receiver by indexing the database. See *id.* at 2:53–56, Fig.

2:210. If the next crossing is subject to state regulations, the warning is activated in accordance with state regulations. *See id.* at 2:56–60, Fig. 2:220, 230. If the next crossing is not subject to state regulations, the system treats the grade crossing as subject to Federal Regulation 49 C.F.R. § 222. *See id.* at 2:59–63, Fig. 2:220. In that case, the control unit determines whether the train is within $\frac{1}{4}$ mile of the crossing, and if it is, calculates the estimated time of arrival at the crossing based on the position and speed of the train reported by the GPS receiver. *See id.* at 2:63–3:2, Fig. 2:240, 250. If the estimated time of arrival is less than 24 seconds, the horn is activated. *See id.* at 3:4–6, Fig. 2:260, 270.

E. Illustrative Claims

Of the challenged claims, claims 1 and 11 are independent, with claims 2–9 dependent from claim 1, and claims 12–19 dependent from claim 11. Claims 1 and 11 are illustrative and are reproduced below with labels added by Petitioner for ease of reference:

1. A computerized method for activating a warning device on a train at a location comprising the steps of:
 - [a] maintaining a database of locations at which a warning device must be activated and corresponding regulations concerning activation of the warning device;
 - [b] obtaining a position of a train and a speed of the train from a positioning system;
 - [c] selecting a next upcoming location from among the locations in the database based on the speed and the position;
 - [d] determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location; and
 - [e] activating the warning device at the point.

11. A system for automatically activating a warning device on a train at a location, the system comprising:
- [a] a control unit;
 - [b] a storage device connected to the control unit, the storage device having stored therein a database of locations at which a warning device must be activated and corresponding regulations concerning activation of the warning device;
 - [c] a positioning system in communication with the control unit, the positioning system being configured to supply a position of a train and a speed of the train to the control unit; and
 - [d] a warning device connected to the control unit;
 - [e] wherein the control unit is configured to perform the steps of
 - selecting a next upcoming location from among the locations in the database;
 - [f] determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location; and
 - [g] activating the warning device at the point.

Ex. 1001, 3:35–48, 4:11–34; *see* Pet. 66, 67–68 (reproducing claims with added labels).

F. Asserted Grounds of Unpatentability

We instituted an *inter partes* review challenging the patentability of the following claims of the '049 Patent on the following grounds and prior art (Pet. 10–64; Dec. 37):

Claims	Statutory Basis	Reference(s)
1–9 and 11–19	§ 103	FR2230 ¹ and Blesener ²
1–7, 9, 11–17, 19	§ 103	FR2230 and Haas ³

¹ Ex. 1006, Use of Locomotive Horns at Highway-Rail Grade Crossings, 65 Fed. Reg. 2230–2270 (Jan. 13, 2000) (“FR2230”).

² Ex. 1007, WO 02/091013 A2, published Nov. 14, 2002 (“Blesener”).

³ Ex. 1008, US 6,519,512 B1, issued Feb. 11, 2003 (“Haas”).

Claims	Statutory Basis	Reference(s)
1–7, 9, 11–17, 19	§ 103	Byers ⁴
8 and 18	§ 103	Byers and Michalek ⁵

II. ANALYSIS

A. Principles of Law

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) the presence of objective indicia of nonobviousness. *Id.* at 17–18; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007).

Objective indicia of nonobviousness, when present, must always be considered en route to the determination of obviousness. *See Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). It is only a part of the “totality of the evidence;” its mere existence does not control the conclusion of obviousness. *See Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1483 (Fed. Cir. 1997) (citations omitted). Objective indicia of nonobviousness “is only relevant to the obviousness inquiry ‘if there is a nexus between the claimed invention and the [objective indicia of nonobviousness].’” *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017) (quoting *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (2006)). A “nexus” is a legally and factually sufficient connection between the objective evidence and the claimed invention such that the

⁴ Ex. 1011, US 7,095,861 B2, issued Aug. 22, 2006 (“Byers”).

⁵ Ex. 1010, US 5,620,155, issued Apr. 15, 1997 (“Michalek”).

objective evidence should be considered in the determination of obviousness. *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must support its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Person of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co., Inc. v. United States*, 702 F.2d 1005, 1011 (Fed. Cir. 1983). Petitioner asserts a person of ordinary skill in the art

as of July 1, 2002, would have had at least an undergraduate degree or the equivalent and at least five (5) years of experience in train operations or train control systems. . . . Such a [person of ordinary skill in the art] would have had knowledge of train control systems, train safety systems that include wayside systems, and train communication systems, and would have understood how to search available literature for relevant publications.

Pet. 9 (citing Ex. 1002 ¶¶ 33–34, 37–39).

Patent Owner asserts that their witness, Dr. Ghaly, and Petitioner's witness, Mr. Ditmeyer, provide different definition of a person of ordinary skill in the art for the '049 Patent. *See* PO Resp. 12 (citing Ex. 1002 ¶ 38; Ex. 2004 ¶ 64). Nonetheless, Patent Owner asserts the difference should not affect the analysis of any issue raised in this *inter partes* review. *See id.*

After considering the factors outlined in *Custom Accessories* and *Orthopedic Equipment*, we adopt Petitioner's definition of a person of ordinary skill in the art.

C. Claim Construction

For petitions filed before November 13, 2018⁶, claims of an unexpired patent are interpreted using the broadest reasonable interpretation in light of the specification. *See* 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Although claims are to be interpreted in light of the specification, limitations from the specification are not to be read into the claims. *See E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003).

⁶ A recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 100(b) effective November 13, 2018).

Petitioner does not submit proposed constructions for any claim term or phrase. *See* Pet. 9–10. Patent Owner provides an explicit claim construction for “corresponding regulations.” *See* PO Resp. 12–25.

“corresponding regulations”

Claim 1 recites “maintaining a database of locations at which the warning device must be activated and corresponding regulations concerning activation of the warning device” (“database limitation”), and “determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location” (“determining limitation”). Ex. 1001, 3:37–39, 3:45–47. Similar to claim 1, independent claim 11 recites “a control unit . . . ; a storage device . . . having stored therein a database of locations at which the warning device must be activated and corresponding regulations concerning activation of the warning device” (“database limitation”), and “the control unit is configured to perform the steps of . . . determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location” (“determining limitation”). Ex. 1001, 4:13–20, 4:27–34.

The ’049 Patent does not provide an explicit definition for “corresponding regulations.” *See* Ex. 1001. Indeed, “corresponding regulations,” or variants thereof, does not appear in the ’049 Patent Specification apart from claims 1 and 11. *See id.*; *see also* Tr. 42:7–8 (Patent Owner’s counsel stating that “corresponding regulations” is not found in the ’049 Patent Specification; only in the claims.).

In the Preliminary Response, Patent Owner set forth the following proposed construction for “corresponding regulations”: “governing regulations applicable for each location at which a warning device must be

activated, such as federal or state rules.” Prelim. Resp. 9–10, 13. For the purpose of the Institution Decision, we did not adopt Patent Owner’s proposed explicit claim construction, and determined that an explicit claim construction was not necessary. Dec. 7.

Patent Owner requests reconsideration of the claim construction determinations from the Institution Decision. *See* PO Resp. 12. Patent Owner asserts that its proposed construction for “corresponding regulations,” which is “governing regulations applicable for each location at which a warning device must be activated, such as federal or state rules,” is the correct construction. *See id.* at 16–23. Patent Owner contends its proposed construction comports with the Federal Circuit’s articulated broadest reasonable construction standard, stems from the context in which the term is used in the claims, it tracks the only description of the invention provided in the ’049 Patent Specification, and is consistent with the understanding of the terms by a person of ordinary skill in the art. *See id.* at 17–22 (citations omitted).

The plain language of claims 1 and 11 recites a database of locations (i.e., plural) at which the warning device must be activated and corresponding regulations (i.e., plural) concerning activation of the warning device, and, based on the determining limitation, further recites a regulation (i.e., one or more regulations) corresponding to the next upcoming location. We note that the recitation of “a regulation” in the determining limitations of claims 1 and 11 means “one or more regulations.” *See KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000) (“[A]n indefinite article a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising.’”). To

illustrate the aforementioned concepts recited by the plain language of claims 1 and 11, we provide the following visual examples of the data maintained or stored in the database.

Table 1 below depicts an example of data maintained or stored in a database, including plural locations, plural corresponding regulations, and one regulation corresponding to an upcoming location.

Location A	Regulation W
Upcoming Location B	Regulation X

Table 1 above depicts two columns and two rows: the first column includes location A in the first row and upcoming location B in the second row; and the second column includes regulation W in the first row corresponding to location A in the first row, and regulation X in the second row corresponding to upcoming location B in the second row of the first column.

Table 2 below depicts an example of data maintained or stored in a database, including plural locations, plural corresponding regulations, and plural regulations corresponding to an upcoming location.

Location A	Regulation W	
Upcoming Location B	Regulation X	Regulation Z

Table 2 above depicts three columns and two rows: the first column includes location A in the first row and upcoming location B in the second row; the second column includes regulation W in the first row corresponding to location A in the first row of the first column, and regulation X in the second row corresponding to upcoming location B in the second row of the first column; and the third column includes regulation Z in the second row corresponding to upcoming location B in the second row of the first column. We also note that the plain language of claims 1 and 11 do not recite or require the regulations (e.g., Regulations W, X, and Z shown in the

examples of Table 1 and Table 2) to be different from one another. Thus, the plain language of claims 1 and 11 permits the regulations (e.g., Regulations W, X, and Z shown in the examples of Table 1 and Table 2) to be identical or different from one another.

In contrast, Patent Owner's proposed construction for "corresponding regulations" in the context of the plain language of the claims 1 and 11 requires a database of locations (i.e., plural) at which the warning device must be activated and governing regulations (plural) applicable *for each location* at which a warning device must be activated, such as federal or state rules, concerning activation of the warning device, and, based on the determining limitation, further requires a regulation (i.e., one or more regulations) corresponding to the next upcoming location. In other words, Patent Owner's construction requires plural regulations for each of the plural locations in the database. To illustrate the aforementioned concept required by the plain language of claims 1 and 11, as modified by Patent Owner's explicit proposed claim construction, we provide the following visual example of data maintained or stored in the database.

Table 3 below depicts an example of data maintained or stored in a database, including plural locations and plural regulations for each location, and one or more regulations corresponding to an upcoming location.

Location A	Regulation W	Regulation Y
Upcoming Location B	Regulation X	Regulation Z

Table 3 above depicts three columns and two rows: the first column includes location A in the first row and upcoming location B in the second row; the second column includes regulation W in the first row corresponding to location A in the first row of the first column, and regulation X in the

second row corresponding to upcoming location B in the second row of the first column; and the third column includes regulation Y in the first row also corresponding to location A in the first row of the first column, and regulation Z in the second row also corresponding to upcoming location B in the second row of the first column. We note that the plain language of claims 1 and 11, as modified by Petitioner's explicit proposed construction, also does not recite or require the regulations (e.g., Regulations W, X, Y, and Z shown in the example of Table 3) to be different from one another.

We conclude that Patent Owner's proposed construction adds additional limitations to claims 1 and 11 beyond what is recited by the plain language of claims 1 and 11 because Patent Owner's proposed construction requires maintaining or storing plural regulations for each of the plural locations in the database. Our conclusion is supported by Patent Owner's following arguments: (1) the '049 Patent Specification "explains that the determination of when to sound a train's horn depends on the analysis of state and federal regulations that may govern a certain location on the track" (PO Resp. 18); (2) Figure 2 of the '049 Patent Specification shows consideration of state rules and federal rules for each location (*see id.* at 18–19 (reproducing Ex. 1001, Fig. 2; citing Ex. 1001, 2:53–3:6)); (3) the "proposed construction reflects the fact that the 'corresponding regulations' may include both federal and state rules, and that the determination of when to sound the warning device depends on which stored rule governs at that next locations" (*id.* at 19); (4) the '049 Patent Specification describes that the invention is necessitated at least in part by the fact that there are certain locations on tracks that require consideration of multiple, potentially conflicting rules, such as when state rules supersede federal rules at a

particular location (*see id.* at 19–20); and (5) “[t]he proposed construction provides context for the term ‘corresponding regulations’ . . . [a]nd it makes clear that the database must maintain multiple regulations, such as federal and state rules, so that a determination can be made” of which regulation governs any particular location (*id.* at 23).

Patent Owner’s aforementioned arguments make clear that Patent Owner’s explicit proposed construction also seeks to import limitations from the ’049 Patent Specification into claims 1 and 11. Although claims are to be interpreted in light of the specification, it is improper to read limitations from the specification into the claims. *See E-Pass*, 343 F.3d at 1369.

Further, it is improper to read limitations into a claim from the preferred embodiment described in the specification, even if it is the only embodiment described, absent clear disclaimer in the specification. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (quoting *Liebel–Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004); citing *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002)).

As pointed out by Petitioner, instead of a disclaimer, the ’049 Patent Specification discloses: “[s]pecific details, such as regulations, distances and times, are set forth in order to provide a thorough understanding of the present invention. The preferred embodiments [*i.e.*, Figure 2] and specific details discussed herein **should not be understood to limit the invention.**”

Reply 4 (quoting Ex. 1001, 2:15–22 (Petitioner’s additions and emphasis)).

Petitioner also points out that the ’049 Patent Specification “explains that ‘[o]bviously, numerous modifications and variations of the present invention are possible in light of the above teachings.’” *Id.* (quoting Ex. 1001, 3:29–31). We note the ’049 Patent Specification also discloses: “[i]t is . . . to be

understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.” Ex. 1001, 3:30–32.

Patent Owner also makes additional statements that undermine Patent Owner’s explicit proposed claim construction for “corresponding regulations.” Specifically, Patent Owner argues:

Patent Owner is not suggesting that there must be multiple regulations stored for *every* location in the database, but there must be multiple regulations stored for *some* locations, or at least the capacity to store and make a determination among multiple locations. Indeed, the algorithm contemplates that certain locations would not have multiple regulations because it describes first looking to see whether state rules are in effect and, if none are stored or otherwise in effect at that location, then it will apply federal rules.

PO Resp. 20 n.6. And at oral argument, Patent Owner’s counsel could not explain the specifics of how the corresponding regulations are stored in the database. *See* Tr. 43–45. Initially, Patent Owner’s counsel acknowledged that the text of the regulations are not stored in the database, but that there are parameters in the database for implementing each regulation. *See* Tr. 43:7–9. According to Patent Owner’s counsel, parameters are “what one of skill in the art would understand to be stored in the database.” *Id.* at 43:7–10. In response to further questions regarding the parameters stored in the database, such as whether the parameters could be a data point that is either a true or false, a data point that is either a zero or one, a pointer to something else, or a variable for an algorithm, (*see* Tr. 43:11–44:7), Patent Owner’s counsel answered that “it can be implemented in probably numerous ways.” Tr. 44:8–9. Upon further questions regarding how the data maintained or stored in the database for “corresponding regulations” is

implemented in the '049 Patent (*see* Tr. 44:14–15), Patent Owner's counsel acknowledged that the '049 Patent Specification “describes essentially just storing the corresponding regulation, the governing regulations. I think one of skill in the art would implement that in any number of ways.” Tr. 44:16–18. Finally, in response to additional questions asking about the data or parameters in the database for “corresponding regulations,” whether it is a zero or one, true or false, or some variable (*see* Tr. 45:11–16), counsel for Patent Owner acknowledged that he did not know what exactly constitutes the parameter or data for “corresponding regulations,” and further stated “the specification is just telling you what is stored – what regulations govern activation.” Tr. 45:17–24.

Based on the foregoing discussion, we summarize that Patent Owner's explicit proposed construction requires maintaining or storing plural locations in the database and plural regulations for each of the plural locations in the database (*see* PO Resp. 16–20), yet, Patent Owner asserts that its proposed construction does not require multiple regulations stored for every location (*see* PO Resp. 20 n.6), and Patent Owner does not know how the data or parameters for “corresponding regulations” in the database are implemented in the '049 Patent (*see* Tr. 43–45). We determine that in addition to improperly importing limitations from the Specification into the claims, Patent Owner's contradictory positions counsel against adopting Patent Owner's proposed construction.

Patent Owner also asserts that the Board's additional claim construction determinations in the Institution Decision are directly contrary to how the invention is described in the Specification and with how a person of ordinary skill in the art would understand “corresponding regulations.”

See PO Resp. 22; *see also id.* at 18–22 (addressing the ’049 Patent Specification disclosure and witness testimony pertaining to “corresponding regulations”). Specifically, Patent Owner takes issue with the following determinations from the Institution Decision: (1) the scope of claims 1 and 11 include “corresponding regulations” that may be identical for all locations, and (2) claims 1 and 11 do not recite or otherwise require a determination by an onboard system of which regulation governs and particular track location. *See id.* at 22 (citing Dec. 6–7, 16, 24, 29). Patent Owner argues the ’049 Patent Specification “only describes a system that indexes a database 130 at step 210, and then determines whether state rules are in effect at a crossing and, if not, whether to apply the federal rule.” *Id.* (citing Ex. 1001, Fig. 2: steps 220–260, 2:53–3:6). Patent Owner asserts that there would be no point to these steps if the system was only required to store and apply one regulation. *See id.* at 22–23. According to Patent Owner, “the Board’s initial claim construction determination is improper as it is ‘divorced from the specification.’” *Id.* at 23 (citing *In re Smith Int’l, Inc.*, 871 F.3d 1375, 1382 (Fed. Cir. 2017)).

We do not agree with Patent Owner’s arguments. Patent Owner’s arguments utilize its proposed construction for “corresponding limitations” as a vehicle for importing additional limitations into the claim from the Specification despite these additional limitations (i.e., different regulations; determining which regulation applies) not being part of Patent Owner’s explicit proposed construction. We acknowledge that the ’049 Patent Specification discloses different regulations, i.e., state and federal regulations, and describes determining which regulation applies to a particular location (*see* Ex. 1001, Fig. 2), however, we decline Patent

Owner's invitation to read limitations from the Specification into the claims because it is improper to do so. *See E-Pass*, 343 F.3d at 1369. Moreover, certain statements by Patent Owner, highlighted above, also undermine Patent Owner's arguments. Specifically, Patent Owner asserts that the '049 Patent Specification discloses an "algorithm [that] contemplates that certain locations would not have multiple regulations because it describes first looking to see whether state rules are in effect and, if none are stored or otherwise in effect at that location, then it will apply federal rules." PO Resp. 20 n.6. Stated another way, the '049 Patent Specification discloses an algorithm that contemplates that certain locations may have only federal rules stored. Finally, we note that, at oral hearing, Patent Owner's counsel also acknowledged that the inclusion of "such as state and federal" in Patent Owner's explicit proposed construction was exemplary and may be removed. *See* Tr. 52:21–53:11.

In sum, we determine that Patent Owner's proposed construction for "corresponding regulations" is improper because it adds limitations from the Specification into the claims, and contradicts Patent Owner's additional positions regarding what is disclosed in the '049 Patent Specification. We further determine that no explicit construction for "corresponding regulations" is necessary. The plain language of claims 1 and 11 reciting a database of locations (i.e., plural) at which the warning device must be activated and corresponding regulations (i.e., plural) concerning activation of the warning device, and a regulation (i.e., one or more regulations), corresponding to the next upcoming location, as shown in the exemplary Tables 1 and 2 above, corresponds with the invention disclosed in the '049 Patent Specification (*see* Ex. 1001, 2:51–3:12; Fig. 2) and is consistent with

Patent Owner’s argument that the ’049 Patent discloses an algorithm that “contemplates that certain locations would not have multiple regulations.”
See PO Resp. 20 n.6.

Other Claim Terms and Phrases

Aside from addressing “corresponding regulations,” for purposes of this Decision, we need not construe explicitly any additional claim terms or phrases. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

D. Unpatentability of Claims 1–7, 9, 11–17, and 19 over Byers

1. Overview of Byers (Ex. 1011)

Byers discloses digital signal processing techniques to modify the shape of the sound field for a train whistle. *See* Ex. 1011, 1:44–56. Byers discloses: “Federal regulations specify that locomotive 130 audibly signal as it approaches the grade crossing with a minimum sound pressure level at defined distances from the crossing.” *Id.* at 2:27–30. The locomotive electronics assembly includes sensors to determine the train’s position and velocity, and a control processor for determining when to activate the whistle and how to shape the sound field. *See id.* at 2:37–38, 2:57–60. The control processor receives inputs from a position sensor (e.g., differential GPS receiver) in order to calculate the distance to the crossing. *See id.* at 2:66–3:14. A speed transducer measures the velocity of the locomotive and a distance sensor determines how far the locomotive advances as it approaches the crossing using wheel rotation sensors. *See id.* at 3:14–17. The control processor includes a database, and may include information

about the latitude and longitude of all crossings on a railroad line. *See id.* at 3:21–25. The positions of the crossings in the database are compared with the position sensor output to determine the distance to the crossing and when to activate the system. *See id.* at 3:25–27.

Byers further discloses a process for automatic activation of the audible alert system. *See* Ex. 1011, 3:62–67, Fig. 3. First, coefficients, tables, and values needed by the processor’s algorithm are read from the database. *See id.* at 4:1–4, Fig. 3:305. Next, the current position of the vehicle is determined and compared with trigger positions previously retrieved from the database to determine whether audible signaling should begin. *See id.* at 4:4–12, Fig. 3:310, 315. If a trigger event is detected and audible signaling should begin, the desired sound file is loaded from the database and produced by the sound transducers. *See id.* at 4:21–41, Fig. 3:315, 320, 330.

2. Analysis of Claims 1 and 11

We are persuaded by Petitioner’s contentions that Byers discloses, teaches, or suggests every limitation of independent claims 1 and 11. *See* Pet. 49–52, 54–56. Our findings for each limitation are presented below.

a. Claim 1, limitation [a]: “maintaining a database of locations at which a warning device must be activated and corresponding regulations concerning activation of the warning device”

We find that Byers teaches or suggests limitation [a] of claim 1. Byers discloses a database that stores information about the latitude and longitude of all grade crossings on a railroad line. *See* Ex. 1011, 3:21–27; Pet. 49–50. Byers also discloses utilizing trigger positions previously retrieved from the database and making a determination of whether to begin

audible signaling of the warning device by comparing the current train position with the trigger positions. *See* Ex. 1011, 4:10–13; Pet. 49. Byers discloses federal regulations specify that a locomotive audibly signal as it approaches the crossing with a minimum pressure level at defined distances from the crossing. *See* Ex. 1011, 2:27–30; Pet. 50. Patent Owner acknowledges, “*Byers* describes using a ‘trigger position,’ which is based on a defined distance away from the crossing.” *See* PO Resp. 54–55 (citing Ex. 1011, 2:27–30, 4:10–20, Fig. 3; Ex. 2004 ¶ 118). Consistent with the acknowledgement by Patent Owner’s counsel at oral argument that the text of regulations are not stored in the database, but parameters are “what one of skill in the art would understand to be stored in the database” (Tr. 43:7–10), we find that Byers’s disclosure of trigger positions (i.e., parameters), stored in the onboard database teaches the claimed “corresponding regulations.” We are persuaded by Petitioner’s contention and find that a person of ordinary skill in the art would have understood that Byers’s trigger positions are points stored in the onboard database at which the train horn is activated in compliance with governing regulations. *See* Ex. 1002 ¶ 65; Pet. 50. We also are persuaded by Petitioner’s contention and find that a person of ordinary skill in the art would have understood Byers to disclose a database that has stored crossing locations and programmed horn activation instructions to comply with federal regulations. *See* Ex. 1002 ¶¶ 63–65; Pet. 51.

Patent Owner argues, “*Byers* fails to disclose the claimed limitations relating to maintaining a database of ‘corresponding regulations.’” PO Resp. 53. According to Patent Owner,

Byers says nothing else about any regulations, including anything about maintaining (storing) ‘corresponding regulations’ for particular locations in a database, such as different and potentially conflicting regulations (*e.g.*, federal and state rules), or anything about a determination by an onboard system of which regulation governs any particular location on the track.

PO Resp. 54 (citing Pet. 58; Ex. 1011, 2:27–30; Ex. 2006, 127:16–129:10).

Patent Owner also contends that *Byers*’s mention of “complying with federal regulations,” and Petitioner’s assertion that a person of ordinary skill in the art would have understood *Byers* to disclose a database that has stored crossing locations and programmed horn activation instructions to comply with federal regulations, do not indicate that there may be different “corresponding regulations” (such as non-federal regulations) that must be stored and analyzed to determine which one applies to any given location on the track. *See id.* at 55–56 (citing Pet. 51; Ex. 2004 ¶¶ 116–117).

We do not agree with Patent Owner’s arguments because they are not commensurate in scope with the limitations. Claim 1 does not recite or otherwise require: (1) different corresponding regulations; (2) storing different and potentially conflicting regulations (*e.g.*, federal and state rules) for particular locations in the database; and (3) analyzing stored regulations to determine which regulation is applicable to different location on the track. As explained above in the Section II.C. addressing the claim construction for “corresponding regulations,” the plain language of claim 1 recites a database of locations (*i.e.*, plural) at which the warning device must be activated and corresponding regulations (*i.e.*, plural) concerning activation of the warning device, and, based on the determining limitation, further recites a regulation (*i.e.*, one or more regulations) corresponding to the next upcoming location. Even if we adopted Patent Owner’s proposed construction, which we do not,

the plain language of claim 1, as modified to include Patent Owner's proposed construction, also would not recite or otherwise require: (1) different corresponding regulations; (2) storing different and potentially conflicting regulations (*e.g.*, federal and state rules) for particular locations in the database; and (3) analyzing stored regulations to determine which regulation is applicable to different location on the track.

For all of the foregoing reasons, we find that Byers teaches or suggests, “maintaining a database of locations at which the warning device must be activated and corresponding regulations concerning activation of the warning device.”

b. Claim 1, limitation [b]: “obtaining a position of a train and a speed of the train from a positioning system”

We find that Byers discloses limitation [b]. Byers discloses a position sensor and a speed sensor connected to a control processor, which teaches a positioning system. *See* Ex. 1011, Fig. 2; Ex. 1002 ¶ 64; Pet. 50. Byers further discloses the position sensor determines the locomotive's position. *See* Ex. 1011, 3:7–13; Pet. 50.

c. Claim 1, limitation [c]: “selecting a next upcoming location from among the locations in the database based on the speed and the position”

We find that Byers teaches or suggests limitation [c]. Byers teaches or suggests information returned from the control processor, speed sensor, and location sensor is compared to the stored locations from the database to determine when to activate the horn. *See* Ex. 1011, 3:21–27, Fig. 2; Ex. 1002 ¶ 64; Pet. 50–51. Byers teaches or suggests control processor selects which crossing in the database is the next upcoming crossing based on

position and speed in order to determine the distance to the crossing. *See* Ex. 1011, 4:10–20; Ex. 1002 ¶ 64; Pet. 51.

d. Claim 1, limitation [d]: “determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location”

We find that Byers teaches or suggests limitation [d]. Byers discloses determining whether audible signaling should commence by comparing the current position with trigger positions previously retrieved from the database. *See* Ex. 1011, 4:10–20; Pet. 51. Byers further discloses that federal regulations specify that the locomotive audibly signal as it approaches the grade crossing with a minimum sound pressure level at defined distances from the crossing. *See* Ex. 1011, 2:27–31; Pet. 51. Patent Owner acknowledges, “Byers describes using a ‘trigger position,’ which is based on a defined distance away from the crossing.” PO Resp. 54–55 (citing Ex. 1011, 2:27–30, 4:10–20, Fig. 3; Ex. 2004 ¶ 118). As explained above, consistent with Patent Owner’s acknowledgment that parameters are what one of skill in the art would understand to be stored in the database (*see* Tr. 43:7–10), we find that Byers’s disclosure of trigger positions stored in the onboard database teaches the claimed “corresponding regulations.” We are persuaded by Petitioner’s contention and find that a person of ordinary skill in the art would have understood Byers to disclose a database that has stored crossing locations and programmed horn activation instructions to comply with federal regulations, and the locomotive train system determines if the locomotive has reached the trigger position before activating the warning device. *See* Pet. 51–52 (citing Ex. 1002 ¶¶ 63–65).

Patent Owner argues, “*Byers* does not say anything about making a determination of when to sound a horn based on any site specific parameters for each grade crossing.” PO Resp. 54 (citing Ex. 2004 ¶¶ 116–117). Patent Owner contends that *Byers*’s “reliance on ‘defined distances’ appears to be a similar approach to that described in Haas, . . . , which applies a uniform threshold of, for example, ¼ mile ahead of crossings to activate the horn.” *Id.* Patent Owner argues, “*Byers* describes using a “‘trigger position,’ which is based on a defined distance away from the crossing.” *Id.* at 54–55 (citing Ex. 1011, 2:27–30, 4:10–20, Fig. 3; Ex. 2004 ¶ 118). Patent Owner contends that there is no suggestion that *Byers*’s system would function any differently when approaching a crossing subject to state rules that may dictate conditions, such as quiet zones or quiet times. *See id.* at 55 (citing Ex. 2006, 127:16–129:10; Ex. 2004 ¶ 119). According to Patent Owner, “an approach that utilizes a uniform one-size-fits-all threshold approach clearly does not teach or suggest a determination by a system on the train of which one of a plurality of potentially conflicting regulations governs any particular location on the track that a train is approaching.” *Id.* (Ex. 2004 ¶ 120).

Patent Owner’s initial assertion that “*Byers* does not say anything about making a determination of when to sound a horn based on any site *specific parameters for each grade crossing*,” (PO Resp. 54 (emphasis added)) is not persuasive because it is undermined by Patent Owner’s acknowledgement that “*Byers* describes using a ‘trigger position,’ which is based on a defined distance from the crossing” (*id.* at 54–55). In other words, Patent Owner acknowledges that a trigger position is a site specific parameter because it is based on a defined distance from the crossing site.

Patent Owner's arguments also are not commensurate in scope with the limitations of claim 1 because claim 1 does not recite or otherwise require: (1) different corresponding regulations or potentially conflicting regulations; (2) state rules; and (3) a determination by a system of which one of a plurality of regulations governs any particular location on the track. Similar to our discussion of Patent Owner's arguments addressing limitation [a] above, even if we adopted Patent Owner's proposed construction for "corresponding regulations," which we do not, the plain language of claim 1, as modified to include Patent Owner's proposed construction, also would not recite or otherwise require: (1) different corresponding regulations or potentially conflicting regulations; (2) state rules; and (3) a determination by a system of which one of a plurality of regulations governs any particular location on the track.

For all of the foregoing reasons, we find that Byers teaches or suggests, "determining a point at which to activate the warning device in compliance with a regulation corresponding to the next upcoming location."

e. Claim 1, limitation [e]: "activating the warning device at the point"

We find that Byers discloses limitation [e]. Byers discloses starting the train whistle when a determination is made to start the whistle using a proximity detector or a differential GPS receiver. *See* Ex. 1011, 1:55–2:6; Pet. 52; *see also* Ex. 1011, 5:14–17; Fig. 3 (disclosing playing a plurality of frames of a sound file 330 calculated according to an algorithm, following a determination that audible signaling should commence at step 315).

Patent Owner argues that Petitioner's obviousness assertions are nothing more than an attempt to apply hindsight reconstruction without evidentiary support in the prior art because: (1) Petitioner's arguments are

based on Byers alone, without citing any secondary reference that would provide evidentiary support for the limitations missing from Byers; and (2) Petitioner (and its expert) fails to set forth any proposed modifications that would have to be made to Byers by a person or ordinary skill in the art, nor do they set forth any motivation to do so, or explain how such modifications would be made to arrive at the invention claimed in the '049 Patent. *See* PO Resp. 56 (citing Ex. 2004 ¶ 121; Ex. 2006, 131:3–132:2).

We do not agree with Patent Owner's argument. As highlighted in the preceding paragraphs, Petitioner asserts, and we find, that Byers discloses, teaches, or suggests each of the limitations of claim 1. Patent Owner does not direct us to persuasive authority to support its argument that a ground of unpatentability under 35 U.S.C. § 103 based a single reference is *per se* improper, and, in such circumstances, that a proposed modification and motivation for the modification is a required. Recently, in similar circumstances where a panel of the Board found a single prior art reference disclosed or taught each of the claim limitations, and determined the challenged claims were unpatentable under 35 U.S.C. § 103, the Federal Circuit concluded that the Board was not required to make any findings regarding a motivation to combine. *See Realtime Data, LLC, v. Iancu*, ___ F.3d ___, 2019 WL 149835, at *4, (Fed. Cir. Jan. 10, 2019).

f. Summary of Analysis of Claim 1

For all of the foregoing reasons, we find that Byers discloses, teaches, or suggests each of the limitations of claims 1.

g. Claim 11

Independent Claim 11 recites substantially the same limitations as limitations [a] through [e] of claim 1. Patent Owner does not present any

argument addressing the limitations of claim 11 separately from the arguments discussed above regarding claim 1. *See* PO Resp. 53–56. For the same reasons as those discussed above addressing limitations [a] through [e] of claim 1, we find that Byers discloses, teaches, or suggests each of the limitations of claim 11 that are substantially the same as limitations [a] through [e] of claim 1. *See* Section II.D.2.

Claim 11 also recites, “a control unit connected to the warning device; a storage device connected to the control unit, the storage device having stored therein a database of . . . ; a positioning system in communication with the control unit” Ex. 1001, 4:14–22. We find that Byers discloses these limitations of claim 11 based on Byers’s disclosures of a control processor connected to a database, a position sensor, a speed sensor, and array of acoustic transducers. *See* Ex. 1011, 2:32–42, 2:57–59, 3:21–27, Fig. 1:140, 150, Fig. 2: 200, 205, 210, 220, 230; Pet. 54–56.

Accordingly, in addition to the reasons explained above addressing claim 1, we find that Byers discloses, teaches, or suggests each of the limitations of independent claim 11.

3. Analysis of Dependent Claims 2–7, 9, 11–17, and 19

Petitioner explains how Byers discloses, teaches, or suggests each of the limitations of dependent claims 2–7, 9, 11–17, and 19. *See* Pet. 52–54, 56–57. Patent Owner does not present any argument addressing these claims separately from the arguments discussed above regarding claim 1. *See* PO Resp. 56. We are persuaded by Petitioner’s contentions.

In particular, with respect to claims 2 and 12, we find that Byers’s trigger positions stored in the database discloses, “the point is a point in space,” recited in claim 2. *See* Ex. 1011, 3:21–27, 4:10–13; Pet. 52, 56.

Regarding claims 3 and 13, we find that Byers discloses using a GPS to determine a locomotive's position, a speed sensor to calculate velocity, and a database storing locations of grade crossings. *See* Ex. 1011, 3:7–14, 3:21–24, Fig. 2; Pet. 51, 56. We are persuaded by Petitioner's assertion and find that “[u]sing these parameters, a [person of ordinary skill in the art] would have understood that *Byers* teaches determining a point in time in the form of an arrival time of a locomotive at a crossing using the relationship between distance, speed, and time.” Pet. 52–53 (citing Ex. 1002 ¶ 66).

As to claims 4, 7, 14, and 17, we find that Byers discloses a position sensor that determines the locomotive's position in order to calculate the distance to the grade crossing. *See* Ex. 1011, 3:7–10; Pet. 53, 56.

Regarding claims 5, 7, 15, and 17, we find that Byers discloses a position sensor that determines the locomotive's position in order to calculate the distance to the grade crossing. *See* Ex. 1011, 3:7–10; Pet. 53, 57. We also find that Byers discloses a database including latitude and longitude information of all grade crossings, and that these positions are compared with the output of the positions sensor to determine when to activate the system and the distance to the intersection. *See* Ex. 1011, 3:23–27; Pet. 53, 57. We also find that Byers discloses a speed sensor connected to the control processor. *See* Ex. 1011, Fig. 2; Pet. 53, 57. We are persuaded by Petitioner's argument and find that “[u]sing these parameters (speed and distance), a [person of ordinary skill in the art] would have understood that *Byers's* system was capable of determining the time a train would arrive at the next upcoming crossing using the known relationship between time, distance, and speed.” Pet. 53–54 (citing Ex. 1002 ¶ 66).

As to claim 6 and 16, we find that Byers discloses the warning device is a horn. *See* Ex. 1011, 1:6–7; Pet. 54, 57.

In regard to claims 9 and 19, we find that Byers discloses a global positioning system receiver. *See* Ex. 1011, 4:5–9; Pet. 54, 57.

In summary, we find that Byers discloses, teaches, or suggests each of the limitations recited in dependent claims 2–7, 9, 12–17, and 19.

4. Objective Indicia of Nonobviousness

Before ultimately resolving the question of obviousness of the subject matter recited in claims 1–7, 9, 11–17, and 19, we must first consider Patent Owner’s objective indicia of nonobviousness. *See Graham*, 383 U.S. at 17–18; *Stratoflex*, 713 F.2d at 1538. Patent Owner contends that the subject matter of the challenged claims is nonobvious based on evidence of long-felt but unmet need, “acquiescence by industry,” and licensing. PO Resp. 60–68; Supp. Info.

Objective indicia of nonobviousness “is only relevant to the obviousness inquiry ‘if there is a nexus between the claimed invention and the [objective indicia of nonobviousness].’” *Affinity Labs*, 856 F.3d at 901 (quoting *Ormco*, 463 F.3d at 1312). For objective indicia of nonobviousness to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention. *ClassCo, Inc., v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016). “[T]here is no nexus unless the evidence presented is ‘reasonably commensurate with the scope of the claims.’” *Id.* (citing *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013) (quoting *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011))).

a. Long-felt but Unmet Need

Patent Owner argues there was a long-felt need for the claimed invention based on a high number of train collisions at public road crossings. *See* PO Resp. 60. Patent Owner asserts, referencing the testimony of Petitioner’s witness Mr. Ditmeyer, train crashes at railroad crossings had been “a perennial problem for the railroad industry” and “the single largest cause of injuries and fatalities involving railroads,” with a “principal cause” of such crashes being motorists “failing to stop at grade crossings to allow trains to pass.” *See id.* at 60–61 (quoting Ex. 2006, 22:10–25, 23:7–17; citing Ex. 2004 ¶ 130); *id.* at 64 (citing Ex. 2006, 22:10–25, 23:7–17). Patent Owner also directs attention to the disclosure in FR2230 of troubling statistics concerning train and highway vehicle collisions. *See id.* at 61 (reproducing Ex. 1006, 1; citing Ex. 1001, 1:20–31). Patent Owner asserts that FR2230 cited numerous U.S. government studies concluding that proper sounding of horns can reduce crashes and fatalities. *See id.* at 61–62 (reproducing Ex. 1006, 5; citing Ex. 1006, 5; Ex. 2006, 26:21–28:18); *see also id.* at 63–64 (citing Ex. 1002 ¶¶ 22–27; asserting Petitioner’s witness Mr. Ditmeyer provided similar testimony). Patent owner acknowledges, “there does not appear to be any dispute that the sounding of horns had long been viewed by the industry as one way of alerting motorists to an oncoming train and was found to be an effective way to reduce the number of crashes.” *See id.* at 62 (citing Ex. 2006, 23:19–24:15; Ex. 2004 ¶¶ 128–130).

Patent Owner contends that the inventors of the challenged patent explained that one of the reasons for the high number of train accidents at crossings was the difficulty that a train operator faced in determining when to activate the horn. *See* PO Resp. 62 (citing Ex. 1001, 1:42–52).

Patent Owner asserts that automatic train control first went into use in the 1930s, and by the 1970s the National Transportation Safety Board was recommending the development of automatic train control systems. *See id.* at 62–63 (citing Ex. 2006, 30:14–25; Ex. 1002 ¶ 29); *see also id.* at 64 (citing Ex. 1002 ¶¶ 28–32; asserting Petitioner’s witness Mr. Ditmeyer provided similar testimony). Patent Owner argues “[y]et as of the time the application for the ’049 Patent was filed in July of 2002, there *still* was no system that automated the process of activating a train’s horn in compliance with governing regulations.” *Id.* at 63 (Ex. 2004 ¶ 131).

In order to show a long-felt but unmet need for the claimed invention, the objective evidence must show that the need was a persistent one that was recognized by those of ordinary skill in the art. *In re Gershon*, 372 F.2d 535, 538 (CCPA 1967). Patent Owner’s evidence and arguments based on the evidence are insufficient to demonstrate a long-felt need for the claimed invention. Patent Owner’s evidence shows that there was a long-felt need to reduce collisions between trains and vehicles at crossings by sounding the horn at crossings. *See* PO Resp. 60–62; Reply 22. Patent Owner’s evidence also shows that Automatic Train Control went into use long ago in the 1930s, and that recommendations were made long ago in the 1970s to develop Automatic Train Control systems. *See* PO Resp. 62–63. Patent Owner’s evidence, however, is insufficient to show there was a long-felt need for the claimed invention, namely, a “system that automated the process of activating a train’s horn in compliance with governing regulations” or “a system that could automatically determine when to sound a horn in compliance with applicable regulations.” *See id.* at 62–64. Although Patent Owner asserts that the inventors of the ’049 Patent

explained that one of the reasons for the high number of train accidents at crossings was the difficulty that a train operator faced in determining when to activate the horn (*see* PO Resp. 62 (citing Ex. 1001, 1:42–52)), Patent Owner’s cited evidence is insufficient to show that this need was long-felt, as opposed to a need recognized at the time of the invention by inventors of the challenged patent.

And because Patent Owner’s evidence is insufficient to show long-felt need, Patent Owner’s arguments directed to the failure of others to solve the problem (i.e., meet the need) (*see* PO Resp. 63–65) also are insufficient demonstrate a long-felt unmet need. Finally, Patent Owner’s assertion that, at the time of the effective filing date of the challenged patent, there still was no system that automated the process of activating a train’s horn in compliance with governing regulations (*see id.* at 63 (citing Ex. 2004 ¶ 131)) is insufficient to show a long-felt unmet need. Without a showing of long-felt need, the mere passage of time without the claimed invention cannot substitute for objective evidence of nonobviousness. *In re Kahn*, 441 F.3d 977, 990–91 (Fed. Cir. 2006) (citations omitted).

Patent Owner also argues that Petitioner’s Application No. 10/437,514 (Ex. 2008) “described the long-felt need caused by train collisions and when to sound the horn.” *See* PO Resp. 65–66 (reproducing Ex. 2008, 51–52; citing Ex. 2008, 11–15). According to Patent Owner, “Petitioner also felt that the problem of determining when to sound a horn was a significant problem that had not yet been solved.” *See id.* at 66 (citing *Anderson Corp. v. Pella Corp.*, 300 F. App’x. 893, 899–900 (Fed. Cir. 2008) for noting that statements of long-felt need contained in accused infringer’s patent applications provide evidence of secondary considerations).

We have reviewed Patent Owner's cited evidence and find that the inventors of Application No. 10/437,514 recognized that: (1) grade crossings and whistle posts have been a notorious site for collisions between trains and locomotives; (2) the horn blast from locomotives must occur at a sufficient distance from the grade crossing to ensure that motor vehicle drivers have sufficient time to stop in response to a warning signal; and (3) problems associated with the horn blast occurring at a crossing include maintaining uniform blast durations and discernable differences between long and short blasts, and guaranteeing the entire sequence will be executed within the allocated window of time so the final long blast will begin before the locomotive crossed the intersection and continues until the locomotive has crossed through the other side of the intersection. *See* Ex. 2008, 51–52. Patent Owner's evidence, however, is insufficient to show there was a long-felt need for the claimed invention, namely, a “system that automated the process of activating a train's horn in compliance with governing regulations” or “a system that could automatically determine when to sound a horn in compliance with applicable regulations.” *See* PO Resp. 62–64. Moreover, to the extent that Patent Owner's citations to Exhibit 2008 identify certain problems associated with blasting a locomotive horn at a crossing at an appropriate time, Patent Owner's evidence is insufficient to show that these identified problems or needs were long-felt, as opposed to recognized contemporaneously by the applicants at the time of filing Application No. 10/437,514. Patent Owner also does not show how such needs were unmet by prior art such as Byers, which also teaches an automated system for activating the horn at an appropriate time and distance before the crossing.

For the foregoing reasons, we do not give substantial weight to Patent Owner's evidence of long-felt but unmet need.

b. Acquiescence by Industry⁷ and Licensing

Patent Owner argues, “[t]he respect that others in the industry, including Petitioner . . . , have afforded the ’049 Patent [] supports the non-obviousness of the challenged claims.” PO Resp. 66. In support of its argument, Patent Owner quotes *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983) for the following: “[r]ecognition and acceptance of the patent by competitors who take licenses under it to avail themselves of the merits of the invention is evidence of nonobviousness.” *Id.* at 66–67 (citing *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013)). Patent Owner presents evidence of licensing (Exs. 2010, 2017), a request by Petitioner for a license from Patent Owner (Ex. 2011), and excerpts of cross-examination testimony of Petitioner's employees (Exs. 2012, 2013). *See* PO Resp. 67–68; Supp. Info.

In regard to the license offered as Exhibit 2010, Patent Owner asserts that its “predecessor granted a license to practice the patent to one of the leading suppliers of rail-based freight transportation systems.” PO Resp. 67. Patent Owner contends the license is not a portfolio license, but is instead directed only to the ’049 Patent and its child ’110 Patent. *See id.* According

⁷ Patent Owner utilizes the title “Acquiescence by Industry” in its Response. PO Resp. 66. At oral hearing, counsel for Patent Owner alternatively used the terms “respect for the patent,” “industry praise,” and “industry recognition.” *See* Tr. 32:16–21.

to Patent Owner, “[t]his license demonstrates respect for the patented automatic horn activation technology.” *Id.*

Petitioner contends that Patent Owner has failed to identify any nexus between its evidence of licenses and the claims of the ’049 Patent. *See* Reply 21, 24. Petitioner argues there is nothing about Exhibit 2010 to suggest that Patent Owner had technology that was desirable. *See id.* at 23. Petitioner argues that there may be other underlying reasons for the license, and asserts that Patent Owner agreed that the ’049 Patent had little value. *See id.* at 24 (citing Ex. 2010, 1; *VSR Indus., Inc. v. Cole Kepro Int’l, LLC*, Case IPR2015-00182, slip op. at 47 (PTAB Apr. 28, 2016) (Paper 33)).

We have reviewed Patent Owner’s cited evidence and arguments based on the evidence and find they are insufficient to establish a nexus between the license and the merits of the claimed invention. Although we recognize that the license agreement lists the ’049 Patent and its child ’110 Patent as the only patents subject to the license agreement (*see* Ex. 2010, 2 (Section 1.3)), Patent Owner’s unsupported attorney argument that the license itself demonstrates respect is insufficient to establish a nexus. The mere existence of a license, without more specific information about the circumstances surrounding the license, is not a good indicator of nonobviousness. In *EWP Corp. v Reliance Universal Inc.*, 755 F.2d 898, 907–08 (Fed. Cir. 1985), the Court of Appeals for the Federal Circuit stated:

Such [licensing] programs are not infallible guides to patentability. They sometimes succeed because they are mutually beneficial to the licensed group or because of business judgments that it is cheaper to take licenses than to defend infringement suits, or for other reasons unrelated to the unobviousness of the licensed subject matter.

Patent Owner provides no evidence to elucidate the circumstances surrounding the license. For example, Patent Owner does not provide evidence to show that the licensee was motivated to enter into the license agreement because of the merits of the claimed invention, as opposed to other business reasons. *See In re Antor Media Corp.*, 689 F.3d 1282, 1293–94 (Fed. Cir. 2012) (finding Antor provided no evidence showing that their licensing program was successful either because of the merits of the claimed invention or because they were entered into as business decisions to avoid litigation, because of prior business relationships, or for other economic reasons); *Bosch Auto. Serv. Sol., LLC v. Matal*, 878 F.3d 1027, 1038 (Fed. Cir. 2017) (finding no evidence in the record that the license agreements arose out of a recognition and acceptance of the merits of the claimed invention, rather than solely to avoid litigation costs).

As to the license offered as Exhibit 2017, Patent Owner asserts the license serves as additional evidence of secondary considerations supporting the nonobviousness of the invention covered by the challenged claims. *See* Supp. Info. 1. Patent Owner contends, “[t]he license is not a portfolio license, but instead is directed only to the ’110 Patent . . . and its parent ’049 Patent, thus confirming the requisite nexus between the asserted secondary considerations evidence and the claimed invention.” *Id.* at 1–2 (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016); *Rambus*, 731 F.3d at 1257). According to Patent Owner, “[t]he terms of the agreement do not suggest that [the license] stemmed from anything other than a *bona fide* desire on the part of the licensee to use the patented horn activation technology.” *Id.* at 2. Patent Owner alleges that, although the licensee did not authorize Patent Owner to disclose the financial terms of the

license, “the redacted license demonstrates respect for the patented technology through N[orfolk] S[outhern]’s stated desire to ‘purchase a fleetwide license.’” *Id.* (quoting Ex. 2017, 4). According to Patent Owner, “this license was requested by N[orfolk] S[outhern] notwithstanding the pendency of the current IPR proceeding, demonstrating a belief in the validity and value of the patented technology.” *Id.* Petitioner contends that Patent Owner ignores the requirement that there must be some nexus between the alleged indicia of nonobviousness and the claims. *See* Resp. Supp. Info. 1 (citing *WBIP*, 829 F.3d at 1329–30).

We agree with Petitioner that Patent Owner ignores the requirement for nexus. “Our cases specifically require affirmative evidence of nexus where the evidence . . . presented is a license.” *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004) (quoted with approval in *Bosch*, 878 F.3d at 1038). We have reviewed Patent Owner’s cited evidence and arguments based on the evidence and find they are insufficient to establish a nexus between the license and the merits of the claimed invention. Similar to our review of the license of Exhibit 2010 discussed immediately above, we recognize the license of Exhibit 2017 lists the ’049 Patent and its child ’110 Patent as the only patents subject to the license agreement. *See* Ex. 2017, 2 (Section 1.3). However, Patent Owner’s unsupported attorney argument that “the terms of the agreement do not suggest that [the license] stemmed from anything other than a *bona fide* desire on the part of the licensee to use the patented horn activation technology” is insufficient to establish a nexus between the license and the merits of the claimed invention. As explained above, the mere existence of a license, without more specific information about the circumstances

surrounding the licensing, is not a good indicator of nonobviousness. *See EWP*, 755 F.2d at 907–08. Patent Owner provides no evidence regarding the circumstances surrounding the license. For example, Patent Owner does not provide evidence to show that the licensee was motivated to enter into the license agreement because of the merits of the claimed invention, as opposed to other business reasons. *See Antor Media*, 689 F.3d at 1293–94; *Bosch*, 878 F.3d at 1038. Moreover, and as pointed out by Petitioner (*See Resp. Supp. Info. 1*), the license agreement expressly discloses that Norfolk Southern’s desire to purchase the license was “to promote interoperability across multiple suppliers.” Ex. 2017, 1. Finally, we agree with Petitioner that Patent Owner’s allegation that Norfolk Southern requested the license despite the IPR proceedings, and thus allegedly demonstrating a belief in the validity and value of the patented technology, is nothing more than unsupported attorney argument. *See Resp. Supp. Info. 2*. Patent Owner’s unsupported attorney argument is insufficient to demonstrate a nexus between the license and the merits of the invention.

Further, Patent Owner’s licensing evidence provides scant basis for assessing the value of the ’049 Patent. One license is provided for “a nominal fee,” and the royalty rates were redacted from the other license. *See Ex. 2010, 1; Ex. 2017, 4–5; see also Tr. 40:16–20* (Patent Owner acknowledging the difficulty of determining how much value to attribute to the invention when the license does not provide the amount of the royalty rate). Under these circumstances, we find it “difficult to ascertain whether these licenses arose out of recognition and acceptance of the claimed subject matter . . . or for some other reason unrelated to the merits of the [’049] patent.” *Cole Kepro Int’l, LLC v. VSR Indus., Inc.*, 695 Fed. App’x 566, 573

(Fed. Cir. 2017) (affirming Board’s analysis according low weight to licensing evidence, based in part on the small payment amounts due under the licenses). For this reason as well, Patent Owner’s licensing evidence is entitled to little or no weight in the obviousness analysis.

Turning to Patent Owner’s evidence of Petitioner’s request for a license (Ex. 2011), Patent Owner argues that Petitioner “demonstrated a belief in the merits of the ’049 [P]atent” because the President of Petitioner’s Electronic Group specifically requested a license from Patent Owner to the Siemens Horn Activation Patents. *See* PO Resp. 67–68. Petitioner argues that Patent Owner fails to allege a nexus between Exhibit 2011 and the claims of the ’049 Patent. *See* Reply 24 (citing *ClassCo*, 838 F.3d at 1220).

We have reviewed Patent Owner’s cited evidence and arguments based on the evidence and find they are insufficient to establish a nexus between the Petitioner’s request for a license and the merits of the claimed invention. As pointed out by Petitioner, Petitioner may have sought a license from Patent Owner for other reasons. *See* Reply 24–25 (quoting Ex. 2011; Ex. 2013, 173:6–14⁸). Among such other potential reasons is avoiding the costs of litigation, because Patent Owner agrees that Petitioner sent its letter after Patent Owner had already filed an infringement suit against Petitioner. *See* Tr. 64:4–6.

Patent Owner also presents testimony by Petitioner’s Vice President, General Manager of Train Control Jeffrey Knott, describing the ’049 Patent as “a pretty solid patent” as evidence supporting Patent Owner’s argument

⁸ Petitioner references the original page number of the transcript, not the page number of Exhibit 2013.

that Petitioner “demonstrated a belief in the merits of the ’049 [P]atent.” PO Resp. 67–68 (citing Ex. 2012, 309:21–310:16⁹). Petitioner asserts that Patent Owner has failed to allege a nexus between Mr. Knott’s testimony and the claims of the ’049 Patent. *See* Reply 26. According to Petitioner, Mr. Knott’s statements are predicated on the patent covering horn sequencing. *See* Reply 25 (citing Ex. 2012, 309:3–16; Ex. 1015, 74:3–17).

We have reviewed Patent Owner’s cited evidence and arguments and find it insufficient to establish a nexus between Mr. Knott’s “a pretty solid patent” statement and the merits of the claimed invention. We agree with Petitioner that Mr. Knott’s statements are predicated on the patent covering horn sequencing because Mr. Knott’s testimony refers to the patent as “the horn sequencing patent.” Ex. 2012, 309:8–9; *see also* Ex. 2012, 309:17–20 (“a patent on horn sequencing”).

Finally, Patent Owner also presents testimony by Petitioner’s Director of Engineering Jeffrey Kernwein and asserts, “[t]his further demonstrates a respect for the merits of the patented technology.” PO Resp. 68. According to Patent Owner, Mr. Kernwein “explained that Petitioner has several versions of its software code – one of which does not practice the patented technology and the other which does practice the patented technology – *and it will only offer the version that practices the patented technology to customers that can show they are licensed by Patent Owner.*” *Id.* (citing Ex. 2013, 173:6–14). Petitioner argues that Patent Owner has failed to allege a

⁹ Patent Owner references the original page number of the transcript, not the page number of Exhibit 2012.

nexus between Mr. Kernwein's testimony and the claims of the '049 Patent. *See* Reply 26.

We have reviewed Patent Owner's cited evidence and arguments based on the evidence and find they are insufficient to establish a nexus between Mr. Kernwein's testimony and the merits of the claimed invention. Specifically, Patent Owner's cited evidence is not reasonably commensurate with the scope of the claims because Mr. Kernwein's cited testimony addresses only "automatic horn activation" (*see* Ex. 2013, 173:6–14) and does not address a "system that automated the process of activating a train's horn in compliance with governing regulations" or "a system that could automatically determine when to sound a horn in compliance with applicable regulations." *See* PO Resp. 62–64.

For all of the foregoing reasons, we do not give substantial weight to Patent Owner's evidence of "acquiescence by industry" and licensing.

5. Conclusion of Obviousness

We have carefully weighed and evaluated the scope and content of the prior art, the differences between the claimed subject matter and the prior art, and the level of skill in the art, along with the evidence of objective indicia of nonobviousness. Upon careful consideration of the evidence as a whole, and weighing it anew, the evidence supporting obviousness strongly outweighs the evidence of nonobviousness. Accordingly, by a preponderance of the evidence, we determine claims 1–7, 9, 11–17, and 19 are unpatentable under 35 U.S.C. § 103 over Byers.

E. Unpatentability of Claims 8 and 18 over Byers and Michalek

1. Overview of Michalek (Ex. 1010)

Michalek discloses a signaling system providing a locomotive the capability to wirelessly signal its approach to an upcoming railroad crossing in order for the crossing to activate warning devices. *See* Ex. 1010, 4:39–43, 4:48–51, 6:45–50, 8:24–26, 8:31–39. The locomotive includes a global positioning system (GPS) receiver to provide a determination of the train location and the proximity to known crossings. *See id.* at 3:40–47, 3:61–65, 4:43–48, 6:5–8, 6:15–18, 8:1–23. The crossing includes a self-diagnostic mechanism for checking the function of the warning devices. *See id.* at 3:20–22, 4:51–54, 6:16–21, 9:49–53. The information, along with identification data of the particular crossing is wirelessly transmitted to the locomotive as it passes the crossing, and subsequently stored in the locomotive’s memory. *See id.* at 3:26–28, 4:54–61; 6:21–35, 9:22–39, 9:53–56.

2. Analysis of Dependent Claims 8 and 18

Claims 8 and 18 depend respectively from independent claims 1 and 11. Claim 8 recites, “updating the database via wireless communication,” and claim 18 recites, “a wireless transceiver connected to the control unit and the control unit is further configured to update the database with information received via the wireless transceiver.” *See* Ex. 1001, 4:5–6, 4:51–55.

Petitioner asserts, and we find, that Byers is silent as to the inclusion of updating the database and does not detail a mechanism for ensuring that the database stores currently-accurate information. *See* Ex. 1002

¶¶ 101–103, 107; Pet. 60–61. Petitioner contends, and we find, that

Michalek recognizes the problem of outdated data in an onboard database and proposes a wireless update solution in order to give railroad maintenance personnel accurate information concerning which crossings are in need of attention. Ex. 1010, 7:16–34; Ex. 1002 ¶ 103; Pet. 60. As pointed out by Petitioner, we find that, in Michalek, crossing devices perform self-diagnostic checks, the results of which are transmitted wirelessly from the crossing to the locomotive and stored in the locomotive’s memory. Ex. 1010, 7:15–35, 9:22–39; Ex. 1002 ¶ 106; Pet. 60–61.

Petitioner contends that a person of ordinary skill in the art “recognizing that the problem identified in *Michalek* would be present in *Byers* would have looked to *Michalek*’s solution as to how to update the database system in *Byers*.” Pet. 61 (citing Ex. 1002 ¶¶ 100, 103, 109). Petitioner also asserts a person of ordinary skill in the art “would have noticed the similarities between *Byers* and *Michalek* and would thus have expected the combination to be successful.” *Id.* at 61 (citing Ex. 1010, 8:14–31; Ex. 1002 ¶¶ 100, 104, 105).

We agree with Petitioner, and find that the combination Byers and Michalek teaches or suggests a wireless transceiver and updating the database with information received via the wireless transceiver. *See* Pet. 60–61. We also find that Petitioner has provided sufficient articulated reasoning with rational underpinning to establish that a person of ordinary skill in the art would have modified the teachings of Byers in view of Michalek to include updating the database wirelessly in order to avoid outdated data and provide accurate information. *See* Pet. 60–61; *KSR*, 550 U.S. at 418 (quoting *Kahn*, 441 F.3d at 988). Based on the evidence before

us, we find that the combined teachings of Byers and Michalek would have rendered obvious a wireless transceiver and updating the database via the wireless transceiver.

Patent Owner argues, “*Michalek* only describes wirelessly updating the status of grade crossing equipment, such as battery condition, non-functioning lights or other devices, as well as certain internal checks. PO Resp. 58 (citing Ex. 1010, 7:16–34). Patent Owner argues that *Michalek* does not contain any teaching of updating a database of locations or a database of regulations, which is what is stored in the database referred to in claims 8 and 18. *See id.*; *see also id.* at 59 (arguing same). Patent Owner asserts *Michalek*’s wireless updating is unrelated to when the train must sound a warning device. *See id.* at 58 (citing Ex. 2004 ¶ 126). Patent Owner argues that Byers’s sound-shaping technology would be unaffected by the status of, for example, battery condition or grade crossings. *See id.* Patent Owner contends that there is no suggestion that Byers stores the type of information that *Michalek* refers to updating wirelessly. *See id.* at 59. According to Patent Owner, “[t]here would be no rational reason for a [person of ordinary skill in the art] interested in applying or improving the sound-shaping technology of *Byers* to look to or need to incorporate the wireless updating of maintenance conditions of railroad crossings taught by *Michalek*.” *Id.* at 58–59 (quoting *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017)). Finally, Patent Owner alleges the combination of the teachings of the prior art is based on hindsight. *See id.* at 59 (quoting *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998)).

We do not agree with Patent Owner’s arguments because they are not commensurate in scope with the claim limitations. Claims 8 and 18 do not

recite or require updating any specific type of data within the database. We also do not agree with Patent Owner's arguments because they focus on Michalek's disclosure of wireless updating specific types of data related to maintenance, while the combination is based on Byers's teaching of a locomotive database as modified by Michalek's teaching of wirelessly updating information in a locomotive database. *See In re Heck*, 699 F.2d 1331, 1333 (Fed. Cir. 1983) (citing *In re Lemelson*, 397 F.2d 1006, 1009 (CCPA 1968)) (The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned, as they are a part of the literature and are relevant for all they contain). Thus, contrary to Patent Owner's suggestion, Michalek remains relevant for teaching wirelessly updating information in the onboard (locomotive) database, and Michalek's teachings are not limited to updating the specific data disclosed in Michalek.

Patent Owner does not present evidence of objective indicia of nonobviousness to address claims 8 and 18. Based on the evidence before us, we determine that the combined teachings of Byers and Michalek would have rendered obvious a wireless transceiver and updating the database via the wireless transceiver.

F. Other Grounds of Unpatentability

Petitioner also contends that claims 1–9 and 11–19 are unpatentable under § 103 over FR2230 and Blesener, and that claims 1–7, 9, 11–7, and 19 are unpatentable under § 103 over FR2230 and Haas. *See* Pet. 10–46.

In a final written decision, the Board is required to address the patentability of all claims challenged in a petition. *See* 35 U.S.C. § 318(a) (providing that the Board “shall issue a final written decision with respect to

the patentability of any patent claim challenged by the petitioner and any new claim added” by amendment during the proceeding); *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1354 (2018) (“[W]hen § 318(a) says the Board’s final written decision ‘shall’ resolve the patentability of ‘any patent claim challenged by the petitioner,’ it means the Board must address every claim the petitioner has challenged.”); Guidance on the Impact of SAS on AIA Trial Proceedings (Apr. 26, 2018)¹⁰ (“[I]f the PTAB institutes a trial, the PTAB will institute on all challenges raised in the petition The final written decision will address, to the extent claims are still pending at the time of decision, all patent claims challenged by the petitioner and all new claims added through the amendment process.”). However, we are not aware of any requirement that once all challenged claims have been determined unpatentable, the Board must go on to analyze additional grounds challenging the same claims.¹¹ In some cases, doing so is an inefficient use of the Board’s resources, in that it may detract from the time and attention that is available to analyze and explain our reasoning for the dispositive issues.

¹⁰ Available at www.uspto.gov/patents-application-process/patent-trial-andappeal-board/trials/guidance-impact-sas-aia-trial.

¹¹ We note that in *Adidas AG v. Nike, Inc.*, 894 F.3d 1256 (Fed. Cir. 2018), the Federal Circuit remanded to the Board to consider a second ground when the Board’s final decision had only addressed a first ground covering the same claims. *Id.* at 1258. However, in that case, the Board’s final decision held that the challenged claims were not unpatentable based on the first ground. *Id.* at 1257. And the Board’s decision did not “suggest[] that its conclusions as to ground 1 would be dispositive as to ground 2.” *Id.* Thus, unlike the circumstances here, the Board’s decision in *Nike* was not dispositive of the Petitioner’s challenges.

In final written decisions both before and after *SAS*, the Board has declined to reach grounds that challenge claims that have already been held unpatentable. *See Sure-Fire Elec. Corp. v. Yongjiang Yin*, Case IPR2014-01448, slip op. at 25 (PTAB Feb. 22, 2016) (Paper 56), *aff'd*, 702 F. App'x 981 (Fed. Cir. 2017); *SK Hynix Inc. v. Netlist, Inc.*, Case IPR2017-00692, slip op. at 40 (PTAB July 5, 2018) (Paper 25). Similarly, the Federal Circuit generally declines to reach additional grounds of unpatentability when it has affirmed determinations of unpatentability for the same claims. *See, e.g., Victaulic Co. v. Iancu*, ___ F. App'x ___, 2018 WL 6264235, at *5 (Fed. Cir. Nov. 29, 2018) (“We discern no error in the Board’s analysis and affirm its conclusion that claims 2 and 10 would have been obvious in view of Lewis and Lane. We thus do not reach the question of whether claims 2 and 10 would have been obvious in view of Vieregge and Lane.”); *Cole Kepro*, 695 F. App'x at 570 n.2 (“Because we determine that the Board did not err in concluding that claims 1–14 of the ’814 [patent] are unpatentable as obvious in view of Runte, we do not address the other instituted grounds analyzed by the Board.”); *In re Gleave*, 560 F.3d. 1331, 1338 (Fed. Cir. 2009) (not reaching obviousness after finding anticipation). Here, Petitioner’s other grounds of unpatentability challenge claims we have already determined are unpatentable over Byers, and unpatentable over Byers and Michalek. Accordingly, in the circumstances of this case, we decline to address Petitioner’s other § 103 unpatentability grounds based on FR2230 and Blesener and based on FR2230 and Haas.

G. Petitioner’s Motion to Exclude Exhibits 2010 and 2011

Petitioner moves to exclude Exhibit 2010 and Exhibit 2011 under Rules 401 and 402 of the Federal Rules of Evidence (FRE) as irrelevant and

under FRE 901 as lacking authentication. *See* Mot. to Excl. 1–7. Patent Owner opposes Petitioner’s Motion. *See* Opp. Mot. Excl. Patent Owner also served and filed supplemental evidence consisting of a declaration by Frank Nuzzi (Ex. 2016) in response to Petitioner’s objections to Exhibits 2010 and 2011. *See id.* at 2–3, 8.

It is unnecessary to resolve this evidentiary dispute because we have determined that Petitioner prevails even without excluding Exhibits 2010 and 2011. Thus, we dismiss as moot Petitioner’s Motion to Exclude Exhibits 2010 and 2011.

H. Petitioner’s Motion to Exclude Exhibit 2017

Petitioner moves to exclude Exhibit 2017 under FRE 106, under FRE 401 and 402 as irrelevant, and under FRE 901 as lacking authentication. *See* 2nd Mot. to Excl. 1–8. Patent Owner opposes Petitioner’s Motion. *See* Opp. 2nd Mot. to Excl.

It is unnecessary to resolve this evidentiary dispute because we have determined that Petitioner prevails even without excluding Exhibit 2017. Therefore, we dismiss as moot Petitioner’s Motion to Exclude Exhibit 2017.

III. CONCLUSION

For the foregoing reasons, we determine by a preponderance of the evidence that claims 1–9 and 11–19 of the ’049 Patent are unpatentable.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–7, 9, 11–17, and 19 are unpatentable under 35 U.S.C. § 103 over Byers;

ORDERED that claims 8 and 18 are unpatentable under 35 U.S.C.
§ 103 over Byers and Michalek;

FURTHER ORDERED that Petitioner's Motion to Exclude Exhibits
2010 and 2011 is dismissed as moot;

FURTHER ORDERED that Petitioner's Motion to Exclude Exhibit
2017 is dismissed as moot; and

FURTHER ORDERED that, because this is a Final Written Decision,
parties to the proceeding seeking judicial review of the decision must
comply with the notice and service requirements of 37 C.F.R. § 90.2.

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