

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.¹

IPR2017-01454
Patent 6,978,195 B2

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

PETRAVICK, *Administrative Patent Judge*.

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

¹ Patent Owner represents that on June 1, 2018, Siemens Industry, Inc. transferred ownership of the patent at issue to Siemens Mobility, Inc. See Paper 20. Siemens Mobility, Inc. is represented by the same counsel that previously represented Siemens Industry, Inc. in this proceeding. See *id*.

I. INTRODUCTION

Westinghouse Air Brake Technologies Corporation (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1 and 2 of U.S. Patent No. 6,978,195 B2 (Ex. 1001, “the ’195 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 2 (“Pet.”). We instituted an *inter partes* review on all challenged claims and on all asserted grounds:

No.	Ground	Claims	Prior Art
1	§ 103(a)	1 and 2	Judge ² , GCOR ³ , and Balukin ⁴
2	§ 103(a)	1 and 2	Burns ⁵ , Maonfalcone ⁶ , and Balukin

See Paper 11 (“Dec. on Inst.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 16, “PO Resp.”), and Petitioners filed a Reply (Paper 23, “Reply”). Patent Owner filed a Motion to Exclude certain evidence, which we address in Section IV. An oral hearing was held, a transcript of which is included in the record. Paper 32 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of

² Judge, *BNSF/UP PTS pilot advances in Northwest*, Progressive Railroading, 1996 pp. 49–53 (“Judge”) (Ex. 1011).

³ General Code of Operational Rules, 2000 (“GCOR”) (Ex. 1013).

⁴ US Patent No. 5,787,371; issued July 28, 1998 (“Balukin”) (Ex. 1015).

⁵ Burns et al., *Safety and Productivity Improvement of Railroad Operations by Advanced Train Control Systems*, Proceedings, Technical Papers Presented at the 1989 IEEE/ASME Joint railroad Conference 1989 (“Burns”) (Ex. 1006).

⁶ Monfalcone et al., *Safety Modeling of a Direct Traffic Control (DTC) Train Control System Using the Axiomatic Safety-Critical Assessment Process (ASCAP)*, Annual Reliability and Maintainability Symposium, 2001 Proceedings, the International Symposium on Product Quality and Integrity 2001 pp. 352–357 (“Monfalcone”) (Ex. 1007).

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 prove unpatentability by a preponderance of the evidence. See 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). 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 that Petitioner has shown by a preponderance of the evidence that claims 1 and 2 of the '195 patent are unpatentable. See 35 U.S.C. § 316(e).

A. Related Matters

Patent Owner is asserting the '195 patent against Petitioner in *Siemens Industry, Inc. v. Westinghouse Air Brake Tech. Corp.*, Case No. 1-16-cv-00284 in the U.S. District Court for the District of Delaware. Pet. vi; Paper 5, 1. In addition, the parties list a number of proceedings, including the following, before the Board as related matters:

Case IPR2017-00981, which concerns U.S. Patent No. 7,092,801;

Case IPR2017-01821, which concerns U.S. Patent No. 7,200,471; and

Case IPR2017-02104, which concerns U.S. Patent No. 7,079,926.

See Paper 20, 1.

B. The '195 Patent

The '195 patent is titled "Train Control System and Method of Controlling a Train or Trains" and issued on December 2, 2005. Ex. 1001, (45), (54). The '195 patent relates to the automatic control of trains. *Id.* at 1:12–13.

The '195 patent discusses known systems for controlling trains. *See id.* at 1:15–35, 9:59–64. For example, the '195 patent discloses that traditional methods for controlling trains use a track warrant, which is permission to occupy a given section of track (i.e., a block). *Id.* at 1:23–27. In the traditional method, a dispatcher issues a train warrant verbally to the train conductor or engineer. *Id.* at 1:27–43. The '195 patent discloses that the system is “subject to errors which can be disastrous” because it relies upon human beings. *Id.* at 1:44–47; *see id.* at 1:57–58.

The '195 patent teaches that it was known to increase the safety of trains by “automat[ing] various aspects of train operation” and that “efforts at automation have been made.” *Id.* at 1:19–22, 2:19; *see also id.* at 3:27–35. For example, the '195 patent discloses that “systems, such as the Advanced Train Control [“ATC”] System proposed by Rockwell International, will automatically apply the brakes if a track warrant is about to be exceeded.” *Id.* at 2:53–56. The '195 patent discloses that ATC Systems have been combined with Positive Train Stop (“PTS”) systems, which anticipates signaling and will stop or slow a train. *Id.* at 2:62–67. For example, the PTS system will stop a train automatically before it runs through a stop signal. *Id.* at 3:1–3. The '195 patent further discloses that “some of the descriptions of PTS systems the inventors hereof have seen in trade publications apparently indicate that a train will not be allowed to move until it has received a track warrant from a dispatcher (i.e., a track warrant or track authority).” *Id.* at 9:60–64.

In addition to disclosing that it was known for a dispatcher to control a train on a main line track using track warrants, the '195 patent discloses that it was known for a yardmaster to control a train in a train yard using

circulation authorities. *Id.* at 9:29–40. A circulation authority is permission to move the train within an area of track (such as a train yard) not controlled by a dispatcher or to an area of track controlled by a dispatcher. *Id.* at 9:35–40.

The '195 patent discloses, “automat[ing] various aspects of train operation” can increase safety of train operations by preventing collisions caused by human error. *Id.* at 1:19–22; *see id.* at 1:11–47, 1:57–58, 2:21, 3:27–35. The '195 patent states “[i]n addition to the performance and safety issues . . . , vandalism is becoming an increasing concern of train operators” and discloses, “[o]ne form of vandalism is the unauthorized moving of trains.” *Id.* at 3:36–39. “Unauthorized movement of a train, whether on a main line, in a train yard, or on some other section of track, can cause much damage even if a stop signal is not violated.” *Id.* at 3:44–46.

The '195 patent solves the problem of “safe operation of a railroad while mitigating the effects of vandalism” by “not allow[ing] the train to move at all, whether the train is on the main line or in a train yard, until an appropriate authority is received.” *Id.* at 3:65–4:10.

The '195 patent discloses:

vandalism concerning the unauthorized movement of trains is a serious problem. The present invention mitigates this problem by ensuring that the train has permission to move on the segment of track on which it is located before it can be moved at all. By way of comparison, while some of the descriptions of PTS systems the inventors hereof have seen in trade publications apparently indicate that a train will not be allowed to move until it has received a track warrant from a dispatcher (i.e., a track warrant or track authority), it appears that such system will not prevent a vandal (or negligent engineer/conductor) from moving a train in a train yard after the train has received the track warrant but before the train has

received a circulation authority to move the train to the section of main line track for which the dispatcher has issued the track warrant. Such unauthorized movement of the train can obviously cause much damage. In contrast, some embodiments of the system 100 will not allow a train that has received a track warrant to move until it has received a circulation authority to move to the section of main line track corresponding to the track warrant. Alternatively, some embodiments will accept an authority that includes both a block of main line track and an area of non-main line track. (In such systems, either a single entity controls both main line track and non-main line track, or the dispatcher and yardmaster communicate with each other so that such an authority may be issued.)

Id. at 9:55–10:13.

C. The Challenged Claims

Claims 1 and 2 are challenged. Claim 1 is reproduced below.

1. A method for controlling the movement of a train from a section of track not on a main line to a section of main line track comprising the steps of:

receiving a track warrant to move a train within a block of main line track;
receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block; and
preventing the train from being moved until both the track warrant and the circulation authority have been received.

Ex. 1001, 12:43–53. Claim 2 depends from claim 1 and further recites that “the circulation authority and the track warrant are received in separate messages.” *Id.* at 12:54–55.

II. ANALYSIS

A. Claim Construction

Under the version of our rules applicable to this *inter partes* review,⁷ the Board interprets claim terms in an unexpired patent according to the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2016); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation approach). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as they would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definitions for claim terms must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

For the purposes of this Decision, we determine that only the terms below require explicit claim constructions in order to resolve the issues before us. *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.’”) (quotation omitted).

“track warrant”

Claim 1 recites a “track warrant.” Ex. 1001, 12:46. “Track warrant” is expressly defined in the ’195 patent. The ’195 patent states “[a] track

⁷ The claim construction standard for *inter partes* reviews has changed for proceedings in which the petition was filed on or after 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 (Nov. 13, 2018) (to be codified at 37 C.F.R. pt. 42).

warrant is essentially a permission for a train to occupy and move on a section of main line track.” Ex. 1001, 9:21–22; *see also id.* at 1:26–27 (“Simply put, a track warrant is permission to occupy a given section of track, i.e., a block.”). We adopted this definition in our Decision on Institution. Dec. on Inst. 7–8. Neither Patent Owner nor Petitioner dispute this definition of “track warrant.” PO Resp. 12; Pet. Reply 4.

“circulation authority”

Claim 1 recites a “circulation authority.” Ex. 1001, 12:48. In our Decision on Institution, we construed “circulation authority” as “an authority that permits a train or locomotive to move within an area of track (such as a train yard) not controlled by a dispatcher, or from an area of track not controlled by a dispatcher.” Dec. on Inst. 8–9 (citing Ex. 1001, 9:35–40). We based our construction upon a statement from the following passage of the ’195 patent:

In contrast to main line track, movement of trains in a train yard is typically under the control of a yardmaster. The yardmaster is responsible for the movement of trains in a train yard, including movement of trains within the train yard (e.g., movement of a train from a resting place to a fuel depot or repair facility) or from the yard to the main line track. The term “circulation authority” has sometimes been used, and will be used herein, *to refer to an authority that permits a train or locomotive to move within an area of track (such as a train yard) not controlled by a dispatcher, or from an area of track not controlled by a dispatcher to an area of track that is controlled by a dispatcher.* The circulation authority may be a simple permission for the train to move, or may provide start and end locations (e.g., the end location may correspond to the start location of the track warrant and the start location may correspond to the current location of the train/locomotive).

Ex. 1001, 9:29–45 (emphasis added). Based on this passage, Patent Owner argues that our construction should have included the phrase “to an area of track that is controlled by a dispatcher” at the end. PO Resp. 12–13 (emphasis omitted). According to Patent Owner, the addition of this phrase is significant because otherwise the definition implies that a circulation authority could authorize train movement onto track controlled by a dispatcher, such as a mainline track. *Id.* at 13. Patent Owner contends that “the specification is clear that a circulation authority can only provide authority for a train to move *to*, not *into*, a section of train controller by a dispatcher.” *Id.*

Petitioner disagrees that the addition of this phrase is significant because, no matter how construed, circulation authorities were known in the prior art. See Pet. Reply. 5–6. Petitioner also contends that an authority that permits a train to move *into* a section of main line track necessarily includes permission for the portion of the train that has not yet entered main line track to move along the non-main line track. *Id.*

We are persuaded by Patent Owner’s arguments that our construction should have included the omitted phrase. We, therefore, revise our construction to be “an authority that permits a train or locomotive to move within an area of track (such as a train yard) not controlled by a dispatcher, or from an area of track not controlled by a dispatcher to an area of track that is controlled by a dispatcher,” as set forth in the above passage of the ’195 patent. Ex. 1001, 9:35–40.

Although not explicitly argued by Patent Owner with respect to its claim construction (see PO Resp. 12–13), Patent Owner’s arguments with respect to the prior art imply that the same entity cannot be both the

dispatcher that issues the track warrant and the entity, such as the yardmaster, that issues the circulation authority. *See, e.g.*, PO Resp. 17–18, 23–25. For example, with respect to GCOR, the Patent Owner argues, “GCOR does not describe any movement authority that could fairly be characterized as a circulation authority, or indeed any authorities at all issued by anyone other than a dispatcher or a control operator (under the director of a dispatcher).” *Id.* at 18. In other words, Patent Owner argues that by definition someone other than a dispatcher or under the control of a dispatcher who issues a track warrant must issue the circulation authority.

Petitioner disagrees and argues that “the ’195 Patent is clear that both ‘track warrants’ and ‘circulation authorities’ are kinds of authorities that can be issued by a dispatcher.” Pet. Reply 3 (citing Ex. 1001, 9:52–54, 10:10–13).

Patent Owner’s implicit argument is not persuasive because it is not consistent with our revised construction or the ’195 patent. Our revised construction is silent as to what entity issues the circulation authority, and does not preclude the same entity from issuing the track warrant and the circulation authority. In our construction, the phrases “not controlled by a dispatcher” and “controlled by a dispatcher” each characterize an area of track. This is consistent with the ’195 patent. This ’195 patent uses the phrase “controlled by a dispatcher” to describe track on the main line (*see* Ex. 1001, 9:16–18) and the phrase “not controlled by a dispatcher” to describe areas of track not on the mainline, for example, track in a yard (*see id.* at 1:40–42 (describing yards, sidings, and secondary track), 9:29–35, 10:8–10). Further, the ’195 patent explicitly describes the dispatcher and the yardmaster may be the same entity. The ’195 patent states,

The entities issuing the circulation authorities and track warrants may be a human being or a computer. The entity issuing a track warrant may be separate from or the same as the entity issuing a circulation authority . . .

In such systems, either a single entity controls both main line track and non-main line track, or the dispatcher and yardmaster communicate with each other so that such an authority may be issued.

Id. at 9:51–54, 10:10–13. Patent Owner acknowledges that:

The specification of the '195 Patent discloses that in an alternate embodiment, both track warrants and circulation authorities could be issued by the same entity, whether a human being or a computer (*e.g.*, a single computer system running both a dispatcher program and a yardmaster program). . . . But even that alternate embodiment doesn't avoid the fact that two different authorities relating to two different types of track (*e.g.*, main line and a yard) must be received before a train not on the main line track is permitted to move.”

PO Resp. 31 n.9 (citing Ex. 1001, 9:52–54, Ex. 2004 ¶ 34). Additionally, Patent Owner's declarant Mr. John Loud's testimony indicates that the same entity, wearing both the “hats” of the dispatcher and the yardmaster, could issue both track warrants and circulation authorities. Ex. 2004 ¶ 34.

We, thus, are not persuaded that our revised construction of circulation authority precludes the same entity from issuing the track warrant and the circulation authority.

B. Obviousness

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The ultimate determination of obviousness under § 103 is a question of law based on underlying factual findings. *In re Baxter Int’l, Inc.*, 678 F.3d 1357, 1362 (Fed. Cir. 2012) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1996)). These underlying factual considerations consist of: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.”⁸ *KSR*, 550 U.S. at 406 (quoting *Graham*, 338 U.S. at 17–18). In this case, the parties did not present any evidence relating to secondary considerations. We discuss the first three *Graham* factors below.

Level of Ordinary Skill in the Art

In the Petition, Petitioner contends that:

[A] POSA as of July 2, 2002 would have had at least a bachelor’s of science degree in electrical engineering, mechanical engineering, aeronautics and astronautics, or a related engineering field, and would also have had at least three (3) years of experience with transportation control and safety systems. . . . Such a POSA would have had knowledge of traffic control systems, and would have understood how to search available literature for relevant publications.

Pet. 15 (citing Ex. 1002 ¶¶ 45–47). Patent Owner disagrees with Petitioner’s definition of the level of ordinary skill in the art because it does not require any background related to train operations or control systems. PO Resp. 14. Patent Owner contends:

⁸ The record contains no evidence or arguments related to secondary considerations.

[A] POSITA should have had an undergraduate engineering degree or the equivalent thereof and at least three years of experience in train operations or train control systems and would have had knowledge of train control systems, train safety systems that include wayside systems, and train communications systems, and would have understood how to search available literature for relevant publications.

Id. (citing Ex. 2004 ¶ 46). Patent Owner argues that train control experience is necessary because the '195 patent relates to control functions concerning movement of a train and authorities governing the movement. PO Resp. 14–15. Petitioner does not dispute this in its Reply. *See generally* Reply.

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 Equipment Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Both Petitioner and Patent Owner's definitions include an undergraduate engineering degree or the equivalent and both include experience related to transportation control and safety systems. The difference between Petitioner's and Patent Owner's definitions is whether the transportation control and safety systems relate specifically to train control and safety systems. Patent Owner's argument that the level of ordinary skill in the art would include experience with train control and safety systems is persuasive. The '195 patent is directed to "automatic control of trains" and solves safety problems with train operations and movements. Ex. 1001, 1:12–3:67; *see also* Ex. 2004 ¶ 47. We are not

persuaded, however, that the definition must be so narrow as to specifically mention wayside systems, a type of train control and safety system, because the '195 patent discloses and challenged claims 1 and 2 encompass train controls system that may not use wayside systems. See Ex. 1001, 2:35–37, 9:6–10:26, 12:43–55.

We determine that a person of ordinary skill in the art (“POSITA”) would have an undergraduate engineering degree or the equivalent thereof and at least three years of experience in train operations or train control systems and would have had knowledge of train control systems and train safety systems.

Weight of Dr. Pullen’s Testimony

Patent Owner argues that we should give the testimony of Petitioner’s declarant Dr. Pullen’s testimony little or no weight because “he does not have relevant experience is train operations or train control systems that would qualify him as a POSITA.” PO Resp. 15. Petitioner disagrees. Pet. Reply 6–7.

Patent Owner’s argument is not persuasive. Dr. Pullen holds several degrees in Aeronautics, a field of study that involves control systems: an undergraduate degree he received in 1989, a Masters degree he received in 1990, and a Ph.D. he received in 1996. Ex. 1003, 1. Dr. Pullen’s declaration indicates that he has “twenty years of experience in the field of transportation safety and control systems, with my last three years specifically focused on train safety and control systems. Ex. 1002 ¶ 7; see also *id.* ¶¶ 8–17 (describing education and experience related to control systems). Dr. Pullen’s lack of experience specific to trains before the last three years may detract from the weight to be given his testimony on certain

matters, but we are not persuaded the entirety of Dr. Pullen’s testimony is entitled to little or no weight.

Ground 1—Judge, GCOR, and Balukin

Claim 1

Petitioner contends that claim 1 is unpatentable over a combination of Judge, GCOR, and Balukin. See Pet. 21–40; Reply 10–18. Petitioner disagrees. PO Resp. 21–43.

Overview of Judge

Judge is an article titled “BNSF/UP PTS Pilot Advances in Northwest,” in the May 1996 issue of Progressive Railroading. Ex. 1011, 49. The article describes a Positive Train Separation (“PTS”) system that for safety “is designed to eliminate collisions.” *Id.* at 49. The article states that the system “does not replace any of the movement authority controls in place today. Train movement will still be authorized by signals, track warrants and other safety system now in use. The PTS system merely enforces these rules.” *Id.*

The PTS system has a server segment, a communications segment, and a locomotive segment. *Id.* at 50. The server observes all train movement authorities granted by the [Computer Aided Dispatching] system and by the dispatcher, and transmits a PTS enforceable authority (“PTSEA”) to a computer on the locomotive. *Id.* The server checks the PTSEA before sending to ensure that it does not conflict with any other rules it is monitoring. *Id.* “Without a PTSEA, a PTS train cannot be moved.” *Id.*

Overview of GCOR

GCOR is a general code of operating rules, which govern the operation of railroads. *Id.* GCOR discloses rules for main track

authorization, yard limits, movement on sidings, and entering a main track. *Id.* at 48, 52, 58, 85. GCOR discloses that “[b]efore initiating movement on a main track, a crew member must: [r]ecieve a track warrant.” *Id.* at 48. GCOR discloses that “the control operators must authorize the train to enter the track” (*id.* at 85) and “[w]here yard limits are in effect in Rule 9.15 (Track Permit) territory, all movements must receive permission from the control operator to enter the main track or to cross over from one main track to another” (*id.* at 52).

Overview of Balukin

Balukin is titled “Apparatus to Enable Controlling a Throttle Controlling from a Remote Host” and issued on July 28, 1998. Ex. 1015, [45], [54]. Balukin discloses a system for controlling the throttle, dynamic brake and reverser from a remote host. *Id.* at 1:11–13. Balukin discloses that “[t]he remote host may be in a small unit which could be carried by a person, so that in a switchyard, a person on foot can control the locomotive,” or “be in a tower for control of trains in a switchyard.” *Id.* at 5:31–38.

Analysis—Claim 1

Petitioner contends that claim 1 is unpatentable over Judge, GCOR, and Balukin. Pet. 21–40. Petitioner relies upon the declaration of Dr. Samuel Pullen for support. Ex. 1002 ¶¶ 54–73, 92–107.

Receiving a Track Warrant

The first step of claim 1 requires “receiving a track warrant to move a train within a block of main line track.” Ex. 1001, 12:46–47. Petitioner relies upon a combination of GCOR and Judge as disclosing this first step. *See* Pet. 32–34 (citing Ex. 1011, 49, 50; Ex. 1013, 22, 48, 92, 103, 126).

GCOR discloses a track warrant control system, which authorizes train movements on a main track within specified limits. *See* Ex. 1013, 22, 28, 92, 103, 126. GCOR discloses, “[b]efore initiating movement on a main track, a crew member must . . . [r]eceive a track warrant.” *Id.* at 48. Likewise, Judge discloses authorizing train movements by track warrants and discloses receiving these authorities at a computer on-board a train. Ex. 1011, 49–50; Ex. 1002 ¶ 56. Given this, Petitioner’s analysis and the evidence of record sufficiently shows that receiving a track warrant to move a train within a block of main line track was known in the prior art. *See also* Ex. 1001, 1:23–40 (discussing the traditional method of track warrant control).

Patent Owner does not dispute that “receiving a track warrant to move a train within a block of main line track” was known in the prior art. *See generally* PO Resp.; Tr. 79:19–21. As Petitioner points out, the ’195 patent itself discloses that this first step was known in the prior art. Pet. 34; Ex. 1001, 1:23–40 (discussing the track warrant control defined by GCOR), 9:6–64 (discussing receiving a track warrant from a dispatcher in PTS systems); *see also* Ex. 1018, 11:1–9.

Receiving a Circulation Authority

The second step of claim 1 requires “receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block.” Ex. 1001, 12:48–50. Petitioner relies upon a combination of GCOR and Judge as teaching this second step. *See* Pet. 35–36. In particular, Petitioner cites to GCOR’s disclosure of requiring permission to enter a main track and Judge’s disclosure of an on-train

computer that receives movement authorities. *Id.* at 35–36 (citing Ex. 1013, 52; Ex. 1011, 50).

GCOR discloses, “[w]here yard limits are in effect in Rule 9.15 (Track Permit) territory, all movements must receive permission from the control operator *to enter the main track* or to cross over from one main track to another as follows: . . . A track permit is issued.” Ex. 1013, 52 (emphasis added); *see also id.* at 85 (discussing track permits to enter the main track). “Yard Limits are . . . restrictions placed on a section of main track that is in close proximity to a yard.” Ex. 2004 ¶ 76(A) (testimony of Mr. Loud); *see also id.* ¶ 76(E) (“Yard limit rules are used on main tracks extending through yards . . .”); ¶¶ 25–26. GCOR’s disclosure suggests that trains enter the main track from yards and, thus, must move from the yard to the main track before entering the main track. *See* Pet. 27–28, 35–36; Ex. 1002 ¶ 96 (testimony of Dr. Pullen). Patent Owner’s declarant Mr. Loud testifies:

30. The dispatcher must authorize movement from the yard onto the main track, because he/she is responsible for all movements on the main track. But just because a dispatcher authorizes this movement of a train that is in the yard does not make the dispatcher’s authorization a circulation authority.

31. Similarly, the yardmaster’s issued authority relates to movements involving the yard. *The yardmaster must authorize a movement from somewhere in the yard to the main track, because he/she is responsible for all movements in the yard.* But just because a yardmaster authorizes this movement to the main track does not make the yardmaster’s authorization a track warrant. Indeed, the yardmaster is unable to authorize movement onto the main track.

Ex. 2004 ¶¶ 30–31. Mr. Loud also testifies that: “And, because a movement from the yard onto the main line track includes movement in the yard, it requires a circulation authority. . . . The yardmaster can only authorize the

yard portion of that movement.” Ex. 1018, 43:21–44:1; *see also id.* at 9:8–10:1, 11:1–9. Similarly, the ’195 patent indicates that circulation authorities to move from a yard to a mainline track were known. The ’195 patent states:

The yardmaster is responsible for movement of trains in a train yard, including . . . *from the yard to the main line track*. The term ‘circulation authority’ has *sometimes been used* . . . to refer to an authority that permits a train or locomotive to move within an area of track (such as a train yard) . . . to an area of track that is controlled by a dispatcher.

Ex. 1001, 9:30–40 (emphasis added); *see also* Tr. 78:13–79:16, 81:8–21; *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1329–30 (Fed. Cir. 2018) (“A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness.”) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988)). Given this, we determine that Petitioner’s analysis and the evidence of record sufficiently shows that receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block was known prior to the ’195 patent.

In reaching our determination, we have taken into account Patent Owner’s arguments, but find them to be unpersuasive. Patent Owner argues that Dr. Pullen “admitted at his deposition on cross examination that GCOR does not disclose any ‘circulation authority.’” PO Resp. 23 (citing Ex. 2006, 64:3–65:10). We acknowledge that Dr. Pullen testifies that “there’s no point where [GCOR] clearly refers to movement that I can find that represents authority to get to the point where you’re about to enter the [track] that you would define as circulation authority that I can find now.” *See* Ex. 2006, 64:3–65:10. Dr. Pullen, however, also testifies that GCOR “definitely

covers the point of entering the main line on to the main line track.” *See id.* As discussed above, GCOR’s disclosure of entering the main line track from a yard suggests that the train must move from the yard to the main track. The other evidence of record, discussed above, including the disclosure in the ’195 patent itself, sufficiently demonstrates that receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block was known prior to the ’195 patent.

Patent Owner also argues that all of Petitioner’s citations to GCOR refer to authorities issued by a dispatcher or a control operator acting under the direction of the dispatcher and, thus, GCOR does not disclose a circulation authority. PO Resp. 24–28. According to Patent Owner, a yardmaster must issue a circulation authority and not a dispatcher or a control operator acting under the direction of the dispatcher. *Id.* Patent Owner’s argument is unpersuasive because it is not commensurate with the scope of claim 1. As discussed above, claim 1 does not preclude the same entity (e.g., a dispatcher or control operator) from issuing both a track warrant and a circulation authority.

Preventing Train Movement

The third step of claim 1 requires “preventing the train from being moved until both the track warrant and the circulation authority have been received.” Ex. 1001, 12:51–53. Petitioner contends that the combination of GCOR, Judge, and Balukin teaches preventing movement of the train until receipt of both the track warrant and the circulation authority. *See* Pet. 25–30, 36–40.

Judge discloses that PTS systems that enforce movement authority controls and that “[w]ithout a PTSEA, a PTSA train cannot be moved.” *Id.*

Ex. 1011, 49–50. Similar to Judge, the ’195 patent states: “some of the descriptions of PTS systems the inventors hereof have seen in trade publication apparently indicate that a train will not be allowed to move until it has received a track warrant from a dispatcher.” Ex. 1001, 9:60–64; *see also* Tr. 79:22–24. The prior art, thus, teaches preventing the train from being moved until a track warrant has been received.

Judge teaches controlling trains based on more than one movement authority. *Id.* at 50 (“[T]he server is designed to observe all train movement authorities granted by . . . the dispatcher. It then transmits these authorities to the computer on board the PTS-equipped locomotives.”). Petitioner’s declarant Dr. Pullen testifies: “At least as early as 1983, PTC systems such as ARES were capable of receiving movement authorities from dispatchers and conditioning train movement on the reception of those authorities, whether the train was on the main line, on a siding, or located in a yard.” Ex. 1002 ¶ 31 (citing Ex. 1006, 33; Ex. 1005, 26–27). Patent Owner’s declarant Mr. Loud testifies, “because a movement from the yard onto the main line track includes movement in the yard, it requires a circulation authority.” Ex. 1018, 43:21–44:1.

Given this, we determine that Petitioner’s analysis and the evidence of record sufficiently shows it would have been obvious to prevent movement of the train until both the track warrant and the circulation authority have been received when controlling the movement of a train from the yard onto or to a section of main line track.

In reaching our determination, we have taken into account Patent Owner’s arguments. Patent Owner argues that the combination of the prior art would still not result in the invention recited in the challenged claims,

since none of the references, whether alone or in combination, disclose preventing the train from being moved until both the track warrant and the circulation authority have been received. PO Resp. 29–33. Patent argues:

Given that none of the prior art references disclose or suggest preventing movement until receipt of a “circulation authority,” it follows that none of those references address requiring dual authorities for the train to both move “within a block of main line track” and “to the block [of the main line track]” before any movement can occur.

Id. at 30–31. Patent Owner asserts that Dr. Pullen admitted that he was unable to point to any reference that required a circulation authority from a yardmaster and a track warrant from a dispatcher before permitting a train to move. *Id.* at 32 (citing Ex. 2006, 124:25–125:22). In other words, Patent Owner argues that because none of the prior art individually discloses preventing movement until receipt of a circulation authority, the combination of references cannot teach preventing the train from being moved until both the track warrant and the circulation authority have been received.

One cannot establish nonobviousness by attacking the references individually when a challenge is predicated upon a combination of prior art disclosures. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Patent Owner’s argument is misplaced because it does not address Petitioner’s challenge, which is based on a combination of Judge, GCOR, and Balukin teaching preventing the train from being moved until receiving both the track warrant and the circulation authority. *See* Pet. 21–40; Pet. Reply 1. As discussed above, we determine that Petitioner’s analysis and the evidence of record sufficiently shows it would have been obvious to prevent the train from being moved until both the track warrant and the

circulation authority have been received when controlling the movement of a train from the yard onto or to a section of main line track.

Patent Owner also argues that Balukin's disclosure of a dynamic braking system fails to disclose preventing movement of a train. PO Resp. 33–34. Patent Owner's argument is misplaced again because Petitioner relies upon Balukin to teach an electronic controller that can provide the function of prohibiting movement of a train, not its disclosure of dynamic braking. *See* Pet. 25, 38–39; Pet. Reply 15. As discussed above, Petitioner relies upon the combination of GCOR and Judge to teach preventing movement of a train without receipt of both a circulation authority and a track warrant. *See* Pet. 36–38.

Motivation to Combine

Petitioner contends that a person of ordinary skill in the art would have been motivated to combine the teachings of GCOR, Judge, and Balukin in order to increase railroad safety. Pet. 25–30.

We agree. Ample evidence in the record and the '195 patent itself demonstrates that it would have been desirable to prevent unauthorized movement of a train to avoid collisions and increase safety. Judge discloses that “[t]he PTS mission is to increase railroad operational safety” (Ex. 1011, 52) and that PTS “is designed to eliminate train collisions” (*id.* at 49). Jefferson⁹ teaches that it is desirable to prevent unauthorized operation of a locomotive by unauthorized personnel, like joy riders. Ex. 1012, 1:40–50. The '195 patent itself discloses that it was known in the prior art to automate train control to increase safety, to reduce human error, and to prevent collisions. *See* Ex. 1001, 1:19–3:35.

⁹ U.S. Patent No. 6,044,673 issued April 4, 2000 (“Jefferson”) (Ex. 1012).

Given this, we determine that Petitioner's analysis and the evidence of record sufficiently shows a POSITA would have been motivated to combine the teachings of Judge, GCOR, and Balukin to prevent train movement until receipt of both the track warrant and the circulation authority in order to avoid collisions and increase safety. See Ex. 1002 ¶¶ 92–107.

In reaching our determination, we have taken into account Patent Owner's arguments. Patent Owner argues that Petitioner's combination of prior art is based on improper hindsight and that Petitioner provides no sufficient rationale for combining the prior art to prevent the train movement until receipt of both the track warrant and the circulation authority. PO Resp. 34–41.

We recognize that

[a]ny judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper.

In re McLaughlin, 443 F.2d 1392, 1395 (CCPA 1971). As discussed above, the record contains ample evidence that a POSITA would have desired to prevent unauthorized movement of a train to avoid collisions and increase safety. Mr. Loud's testimony indicates that POSITA would know that authorization to move a train from a yard onto the main line track requires both a circulation authority and a track warrant. Ex. 1018, 43:21–44:1; Ex. 2004 ¶¶ 30–31. Given this evidence, we do not agree that Petitioner's combination of prior art is based on improper hindsight and that safety is not a sufficient rationale for combining the prior art to prevent the train

movement until receipt of both the track warrant and the circulation authority.

Further, Patent Owner argues that Petitioner’s rationale for combining is insufficient because none of Judge, GCOR, and Balukin recognize the vandalism problem disclosed in the ’195 patent. PO Resp. 41–42. This argument is unpersuasive because the obviousness inquiry does not look only to the problem the patentee was trying to solve. *See Outdry Techs. Corp. v. Geox S.p.A.*, 859 F.3d 1364, 1371 (Fed. Cir. 2017) (“The motivation supported by the record and found by the Board need not be the same motivation articulated in the patent for making the claimed combination.”); *In re Dillon*, 919 F.2d 688, 693 (Fed. Cir. 1990) (en banc) (holding that the motivation to combine the prior art references need not be identical to that of Applicants). Rather, any need or problem known in the field of endeavor at the time of the invention and addressed by the prior art can provide a reason for combining the elements in the manner claimed. *KSR*, 550 U.S. at 402; *Outdry Techs.*, 859 F.3d at 1370–71; *see also In re Kemps*, 97 F.3d 1427, 1430 (Fed. Cir. 1996).

For the reasons discussed above, we determine that Petitioner demonstrates by a preponderance of the evidence that claim 1 is unpatentable over Judge, GCOR, and Balukin.

Analysis—Claim 2

Claim 2 depends from claim 1 and additionally requires “wherein the circulation authority and the track warrant are received in separate messages.” Ex. 1001, 12:54–55. Petitioner contends that GCOR teaches the additional limitation of claim 2. Pet. 40 (citing Ex. 1013, 48, 92, 103; Ex.

1002 ¶ 98). Patent Owner does not dispute that GCOR teaches this limitation. *See* PO Resp. 43. We determine that Petitioner demonstrates by a preponderance of the evidence that claim 2 is unpatentable over GCOR, Judge, and Balukin.

Ground 2—Burns, Monfalcone, and Balukin

Petitioner contends that claims 1 and 2 are unpatentable over a combination of Burns, Monfalcone, and Balukin. *See* Pet. 43–63; Pet. Reply 18–23. For many of the same reasons as discussed above with respect to ground 1, Patent Owner disagrees. PO Resp. 43–61.

Overview of Burns

Burns is a paper titled “Safety and Productivity Improvement of Railroad Operations by Advanced Train Control Systems.” Ex. 1006, 33. Burns discloses an advanced train control system (“ATCS”) that uses an on-board computer or Train Control Computer (“TCC”) to control the train. *Id.* at 34. “The TCC is also the safety device which enforces movement and speed authority limits by applying train brakes when it predicts that the train will otherwise exceed its authorized limits.” *Id.*

Burns discloses that the “ATCS improves safety of train operations by expanding communication of critical information, adding safety enhancing features, and continuously monitoring for the occurrence of specified hazards.” *Id.* at 37. Burns discloses that:

Movement authorities separate and protect trains in unsignaled portions of the railroad, by commanding movements between designated points over particular track segments, into and out of sidings, through speed restrictions and past work crews, after waiting for opposing traffic. Movement authorities protect track forces in all territories. ATCS provides extensive new

capabilities for authority generation, checking, distribution, and enforcement, which yield operating safety enhancements.

Id. After an authority is generated, it is checked against current authorities, approved, and then sent by the dispatcher via a Data Network to the locomotive cab. *Id.* “Once acknowledged, the authority is monitored by the TCC, which will apply brakes if it predicts that the train will soon violate the authority limits.” *Id.*

Overview of Monfalcone

Monfalcone is a paper titled “Safety Modeling of a Direct Traffic Control (DTC) Train Control System Using the Axiomatic Safety-Critical Assessment Process (ASCAP).” Ex. 1007, 352. Monfalcone describes “a simulation-based approach for performing safety analysis in terms of a given train control technology” that “models train movement within a corridor in terms of the physical entities contained and the behavior of the dispatcher and train crews required for train movement.” *Id.* The model provides “the data necessary to quantitatively predict safety for a given corridor. *Id.*

In the model, “train crew agents request authorization to move a train and this train movement authority is granted or denied by the dispatcher agent.” *Id.* at 353. Train crews request entry into blocks, and the dispatcher grants authority for them to do so once it determines that it is safe. *Id.* at 354. The train can only continue into the next block if granted permission by the dispatcher. *Id.* Monfalcone states:

At the start of the simulation, trains are queued at the yards and possibly at spurs to allow for track entry. Train are allowed to leave the yard only when the dispatcher grants authority, since the limits of block authority often exceed the visual range of the train crew. Any subsequent train movement through block

boundaries or out of sidings is also conditioned upon the dispatcher granting authority to the requesting train crew(s).

Id. at 354.

Analysis—Claim 1

Petitioner contends that claim 1 is unpatentable over Burns, Monfalcone, and Balukin. Pet. 43–60. Petitioner relies upon the declaration of Dr. Samuel Pullen for support. Ex. 1002 ¶¶ 69–84, 108–125.

Receiving a Track Warrant

The first step of claim 1 requires “receiving a track warrant to move a train within a block of main line track.” Ex. 1001, 12:46–47. Petitioner relies upon Burns and Monfalcone as disclosing this first step. See Pet. 55–57 (citing Ex. 1006, 33, 37; Ex. 1007, 352, 354–355).

Burns discloses an ATCS that enforces movement authorities by applying a train’s brakes when it predicts that the train will exceed its authority. Ex. 1006, 33–34, 37. Burns teaches that movement authorities include commands from dispatchers to move “between designated points over particular track segments, into and out of sidings, ...” *Id.* at 37. Monfalcone similarly discloses conditioning movement along main line blocks and out of yards or sidings on receiving authority from a dispatcher. *Id.* at 354. Given this, Petitioner’s analysis and the evidence of record sufficiently shows that receiving a track warrant to move a train within a block of main line track was known in the prior art.

Patent Owner does not dispute that “receiving a track warrant to move a train within a block of main line track” was known. See generally PO Resp. As Petitioner points out, the ’195 patent itself discloses that this first step was known in the prior art. Pet. 56–57; Ex. 1001, 1:23–40 (discussing

the track warrant control), 9:6–64 (discussing receiving a track warrant from a dispatcher in PTS systems); *see also* Ex. 1018, 11:1–9.

Receiving a Circulation Authority

The second step of claim 1 requires “receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block.” Ex. 1001, 12:48–50. Petitioner relies upon Monfalcone as teaching this second step. *See* Pet. 57. In particular, Petitioner cites to Monfalcone’s disclosure of requiring authorization for a train to enter the main line from a yard. *Id.* (citing Ex. 1007, 355–356).

Monfalcone discloses that a train must request and receive authority from a dispatcher to enter the main line for either a yard. Ex. 1007, 355. Monfalcone’s disclosure suggests that trains enter the main track from yards and, thus, must move from the yard to the main track before entering. *See* Pet. 57; Ex. 1002 ¶ 96 (testimony of Dr. Pullen). Patent Owner’s declarant Mr. Loud testifies:

30. The dispatcher must authorize movement from the yard onto the main track, because he/she is responsible for all movements on the main track. But just because a dispatcher authorizes this movement of a train that is in the yard does not make the dispatcher’s authorization a circulation authority.

31. Similarly, the yardmaster’s issued authority relates to movements involving the yard. *The yardmaster must authorize a movement from somewhere in the yard to the main track, because he/she is responsible for all movements in the yard.* But just because a yardmaster authorizes this movement to the main track does not make the yardmaster’s authorization a track warrant. Indeed, the yardmaster is unable to authorize movement onto the main track.

Ex. 2004 ¶¶ 30–31. Mr. Loud also testifies that: “And, because a movement from the yard onto the main line track includes movement in the yard, it

requires a circulation authority. . . . The yardmaster can only authorize the yard portion of that movement.” Ex. 1018, 43:21–44:1; *see also id.* at 9:8–10:1, 11:1–9. Similarly, the ’195 patent itself indicates that circulation authorities to move from a yard to a mainline track were known. The ’195 patent states:

The yardmaster is responsible for the movement of trains in a train yard, including . . . *from the yard to the main line track*. The term ‘circulation authority’ has *sometimes been used*, . . . to refer to an authority that permits a train or locomotive to move within an area of track (such as a train yard) . . . to an area of track that is controlled by a dispatcher.

Ex. 1001, 9:30–40 (emphasis added). Given this, we determine that Petitioner’s analysis and the evidence of record sufficiently shows that receiving a circulation authority to move from a section of track not on the main line on which the train is located to the block was known prior to the ’195 patent.

In reaching our determination, we have taken into account Patent Owner’s argument, but found it to be unpersuasive. Patent Owner argues that all of Petitioner’s citations to Monfalcone refer to authorities issued by a dispatcher and, thus, Monfalcone does not disclose a circulation authority. PO Resp. 43–50. According to Patent Owner, a yardmaster must issue a circulation authority and not a dispatcher or a control operator acting under the direction of the dispatcher. *Id.* Patent Owner’s argument is unpersuasive because it is not commensurate with the scope of claim 1. As discussed above, claim 1 does not preclude the same entity (e.g., a dispatcher or control operator) from issuing both a track warrant and a circulation authority.

Preventing Train Movement

The third step of claim 1 requires “preventing the train from being moved until both the track warrant and the circulation authority have been received.” Ex. 1001, 12:51–53. Petitioner contends that the combination of Burns, Monfalcone, and Balukin teaches preventing movement of the train until receipt of both the track warrant and the circulation authority. See Pet. 49–54, 58–60.

Burns discloses its TCC is a safety device, which enforces movement and speed authority limits by applying train brakes when it predicts that the train will otherwise exceed its authorized limits. Ex. 1006, 34, 37. Monfalcone teaches that a train must request and receive authority from a dispatcher to enter the main line from a yard. Ex. 1007, 353, 355–356. Dr. Pullen testifies: “At least as early as 1983, PTC systems such as ARES were capable of receiving movement authorities from dispatchers and conditioning train movement on the reception of those authorities, whether the train was on the main line, on a siding, or located in a yard.” Ex. 1002 ¶ 31 (citing Ex. 1006, 33; Ex. 1005, 26–27). Mr. Loud testifies, “because a movement from the yard onto the main line track includes movement in the yard, it requires a circulation authority.” Ex. 1018, 43:21–44:1.

Given this, we determine that Petitioner’s analysis and the evidence of record sufficiently shows it would have been obvious to prevent the train from being moved until both the track warrant and the circulation authority have been received when controlling the movement of a train from the yard onto or to a section of main line track.

In reaching our determination, we have taken into account Patent Owner’s arguments. Patent Owner argues that the combination of the prior

art would still not result in the invention recited in the challenged claims, since none of the references, whether alone or in combination, disclose preventing the train from being moved until both the track warrant and the circulation authority have been received. PO Resp. 50–54. Patent argues that “none of the prior art references (alone or in combination) teach or suggest ‘preventing movement’ until the receipt of a ‘circulation authority,’ let alone until dual specified authorities . . . are received.” *Id.* at 53. Patent Owner asserts that Dr. Pullen admitted that he was unable to point to any reference that required a circulation authority from a yardmaster and a track warrant from a dispatcher before permitting a train to move. *Id.* at 53 (citing Ex. 2006, 124:25–125:22). In other words, Patent Owner argues that because none of the prior art individually discloses preventing movement until receipt of a circulation authority, the combination of references cannot teach preventing the train from being moved until both the track warrant and the circulation authority have been received.

One cannot establish nonobviousness by attacking the references individually when a challenge is predicated upon a combination of prior art disclosures. *See Merck*, 800 F.2d at 1097. Patent Owner’s argument is misplaced because it does not address Petitioner’s challenge, which is based on a combination of Burns, Monfalcone, and Balukin teaching preventing the train from being moved until receiving both the track warrant and the circulation authority. *See* Pet. 43–60; Pet. Reply 1. As discussed above, we determine that Petitioner’s analysis and the evidence of record sufficiently shows it would have been obvious to prevent the train from being moved until both the track warrant and the circulation authority have been received

when controlling the movement of a train from the yard onto or to a section of main line track.

Patent Owner also argues that Balukin's disclosure of a dynamic braking system fails to disclose preventing movement of a train. PO Resp. 54. Patent Owner's argument are misplaced because Petitioner relies upon Balukin to teach an electronic controller that can provide the function of prohibiting movement of a train not its disclosure of dynamic braking. See Pet. 51–52, 59; Pet. Reply 15. As discussed above, Petitioner relies upon the combination of Burn and Monfalcone to teach preventing movement of a train without receipt of both a circulation authority and a track warrant. See Pet. 58–59.

Motivation to Combine

Petitioner contends that a person of ordinary skill in the art would have been motivated to combine the teachings of Burn, Monfalcone, and Balukin in order to increase railroad safety. Pet. 49–51.

We agree. Ample evidence in the record and the '195 patent itself demonstrates that it would have been desirable to prevent unauthorized movement of a train to avoid collisions and increase safety. Burns teaches that the ATCS system improves safety by automatic enforcement of movement authority and that its TCC is a safety device. Ex. 1006, 33–34. Monfalcone is also concerned with safety and avoiding collision. Ex. 1007, 352, 356. Jefferson teaches that it is desirable to prevent unauthorized operation of a locomotive by unauthorized personnel, like joy riders. Ex. 1012, 1:40–50. The '195 patent itself discloses that it was known in the prior art to automate train control to increase safety, to reduce human error, and to prevent collisions. See Ex. 1001, 1:19–3:35.

Given this, we determine that Petitioner's analysis and the evidence of record sufficiently shows a POSITA would have been motivated to combine the teachings of Judge, GCOR, and Balukin to prevent the train movement until receipt of both the track warrant and the circulation authority in order to increase safety. *See* Ex. 1002 ¶ 124.

In reaching our determination, we have taken into account Patent Owner's arguments. Patent Owner argues that Petitioner's combination of prior art is based on improper hindsight and that Petitioner provides no sufficient rationale for combining the prior art to prevent the train movement until receipt of both the track warrant and the circulation authority. PO Resp. 34–41.

As discussed above, the record contains ample evidence that a POSITA would have desired to prevent unauthorized movement of a train to avoid collisions and increase safety. Mr. Loud's testimony indicates that POSITA would know that authorization to move a train from a yard onto the main line track requires both a circulation authority and a track warrant. Ex. 1018, 43:21–44:1; Ex. 2004 ¶¶ 30–31. Given this evidence, we are not persuaded that the Petitioner's combination of prior art is based on improper hindsight and that safety is not a sufficient rationale for combining the prior art to prevent the train movement until receipt of both the track warrant and the circulation authority.

Further, Patent Owner argues that Petitioner's rationale for combining is insufficient because none of Burns, Monfalcone, and Balukin recognize the vandalism problem disclosed in the '195 patent. PO Resp. 59. But, as discussed above, the obviousness inquiry does not look only to the problem the patentee was trying to solve; instead, any need or problem known in the

field of endeavor at the time of the invention and addressed by the prior art can provide a reason for combining the elements in the manner claimed. *KSR*, 550 US at 402.

For the reasons discussed above, we determine that Petitioner demonstrates by a preponderance of the evidence that claim 1 is unpatentable over Burns, Monfalcone, and Balukin.

Analysis —Claim 2

Petitioner contends that the combination of Burns, Monfalcone, and Balukin teaches “the circulation authority and the track warrant are received in separate messages.” Pet. 60–63; see Ex. 1002 ¶¶ 112–117; Ex. 1006, 37; Ex. 1007, 353–355. Patent Owner does not dispute that GCOR teaches this limitation. See PO Resp. 61. We determine that Petitioner demonstrates by a preponderance of the evidence that claim 2 is unpatentable over GCOR, Judge, and Balukin.

Other Arguments

Patent Owner argues that certain discussions concerning prior art in the '195 patent were not cited in the Petition and, therefore, may not be relied upon to support Petitioner's challenges. See *e.g.*, PO Resp. 29, n.8. Similarly, Patent Owner argues that Jefferson was not identified as a reference relied upon for the grounds sets forth in the Petition and, thus, may not be used to support Petitioner's alleged motivations to combine the prior art references. See *id.* at 41, n.13.

[T]he introduction of new evidence in the course of the trial is to be expected in *inter partes* review trial proceedings and, as long as the opposing party is given notice of the evidence and

an opportunity to respond to it, the introduction of such evidence is perfectly permissible under the APA.

Genzyme Therapeutic Products Limited Partnership v. Biomarin Pharmaceutical Inc., 825 F.3d 1360, 1366 (Fed. Cir. 2016). Patent Owner does not allege that it did not have notice and opportunity to respond to its own admission concerning the prior art made in the '195 patent or the relied upon portions of Jefferson. *See e.g.*, PO Resp. 29, n.8. 41, n.13. Contrary to Patent Owner's argument, Petitioner cited Jefferson and many of the admissions in the Petition. *See e.g.*, Pet. 7, 12, 32, 39, 52–53.

Further, upon reviewing an *inter partes* review decision by the Board, the U.S. Court of Appeals for the Federal Circuit has stated that statements in the specification are “probative on how one with ordinary skill in the art at the time of filing of the involved patent would have read and understood the disclosure of the prior art.” *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 901 (Fed. Cir. 2018) (citing *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1362 (Fed. Cir. 2007) (“Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness.”); *In re Baxter Travenol Labs*, 952 F.2d 388, 390 (Fed. Cir. 1991) (holding extrinsic evidence, including *admissions*, may be used to explain what a reference discloses in a reexamination proceeding).

III. PATENT OWNER'S MOTION TO EXCLUDE

Patent Owner moves to exclude Exhibit 1002, which is the Declaration of Dr. Pullen. *See* Paper 26. Patent Owner urges the exclusion of Dr. Pullen's testimony pursuant to Federal Rule of Evidence 702 on the basis that he has insufficient experience specific to train control. *Id.* at 4–8;

Paper 29, 2–5. Relatedly, Patent Owner argues that Dr. Pullen’s testimony regarding issues to be considered from the perspective of an ordinarily skilled artisan is speculative and therefore inadmissible under Federal Rules of Evidence 402 and 403. Paper 26, 8–9.

Petitioner opposes the motion, arguing that Dr. Pullen has extensive experience in transportation control systems generally, of which train control is a subset, and in recent years has experience specific to train control.

Paper 27, 1–6. Petitioner also points to testimony given in another proceeding by Patent Owner’s expert, Mr. Loud, explaining that he was qualified to testify as an expert in a trial involving personal watercraft controllers by virtue of his engineering background and his experience with railroad control systems. Paper 27, 1–2 (citing Ex. 1036, 43:6–20). Patent Owner responds that Mr. Loud’s testimony regarding his own qualifications in another matter is irrelevant to whether Dr. Pullen is qualified in this proceeding. Paper 29, 1–2.

We are not persuaded that Dr. Pullen’s testimony should be excluded. Dr. Pullen holds several degrees in Aeronautics, a field of study that involves control systems: an undergraduate degree he received in 1989, a Masters degree he received in 1990, and a Ph.D. he received in 1996. Ex. 1003, 1. Dr. Pullen’s declaration indicates that he has “twenty years of experience in the field of transportation safety and control systems, with my last three years specifically focused on train safety and control systems. Ex. 1002 ¶ 7; *see also id.* ¶¶ 8–17 (describing education and experience related to control systems). Thus, at the time of the claimed invention in the ’195 patent (*see* Ex. 1001, (62), indicating a priority date of July 2, 2002), Dr. Pullen had more than the requisite academic training but not the “at least

three years of experience related to train control” required by the definition of POSITA we have adopted above.

Nevertheless, complete overlap between a witness’s technical qualifications and the field of the invention is not necessary for the witness’s testimony to be admissible under Federal Rule of Evidence 702. For example, the Federal Circuit has upheld a district court’s admission under Rule 702 of the testimony of a witness who lacked experience in the design of the patented invention, but had experience with materials selected for use in the invention. *See SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1372–73 (Fed. Cir. 2010). Dr. Pullen has extensive experience and expertise related to control systems, and some experience in more recent years related to train control. Ex. 1002 ¶¶ 7–17; Ex. 1003. Dr. Pullen’s lack of experience specific to trains before 2011 may detract from the weight to be given his testimony on certain matters, but it does not render the entirety of his testimony inadmissible under Rules 702, 402, or 403.

To support its motion, Patent Owner relies heavily on *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356 (Fed. Cir. 2008). *See* Paper 26, 5–6, 8–9; Paper 29, 4. There, the Federal Circuit reviewed the district court’s denial of a motion to exclude a patent lawyer having no relevant technical expertise from testifying in a jury trial. *Sundance*, 550 F.3d at 1361–62. The Federal Circuit held that because the patent attorney “was never offered as a technical expert, and in fact was not qualified as a technical expert, it was an abuse of discretion for the district court to permit him to testify as an expert on the issues of noninfringement or invalidity.” *Id.* at 1362. The Federal Circuit further explained:

The court, in its role as gatekeeper, must exclude expert testimony that is not reliable and specialized, and which invades the province of the jury to find facts and that of the court to make ultimate legal conclusions. Allowing a patent law expert without any technical expertise to testify on the issues of infringement and validity amounts to nothing more than advocacy from the witness stand.

Id. at 1364–65. Here, Dr. Pullen is offered as a technical expert and he has substantial technical expertise related to the field of the '195 patent.

Moreover, in this proceeding, fact-finding and legal determinations are carried out by the same panel of administrative patent judges, which eliminates the concern of invading the jury's province. These distinctions make *Sundance* inapposite as a basis for excluding Dr. Pullen's testimony.

For the foregoing reasons, we deny Patent Owner's motion to exclude Exhibit 1002.

IV. CONCLUSION

We determine that Petitioner has shown by a preponderance of the evidence that claims 1 and 2 are unpatentable under 35 U.S.C. § 103(a) over a combination of GCOR, Judge, and Balukin and over a combination of Burns, Monfalcone, and Balukin.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1 and 2 of U.S. Patent No. 6,978,195 B2 have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude Exhibit 1002 is denied; and

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

PETITIONER:

Jason A. Engel
Alan L. Barry
Roberto Capriotti
Benjamin E. Weed
Ragae Ghabrial
Katherine L. Hoffee
K&L GATES LLP
jason.engel.ptab@klgates.com
al.barry.ptab@klgates.com
roberto.capriotti@klgates.com
benjamin.weed.ptab@klgates.com
ragae.ghabrial@klgates.com
katy.hoffee@klgates.com

PATENT OWNER:

Jeffrey D Sanok
Mark M. Supko
Vincent J. Galluzzo
Scott L. Bittman
CROWELL & MORING LLP
jsanok@crowell.com
muspko@crowell.com
vgalluzzo@crowell.com
sbittman@crowell.com