

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 IPR2017-01263
Patent 6,996,461 B2

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

GOODSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of U.S. Patent No. 6,996,461 B2 (Ex. 1001, “the ’461 patent”) on the following three grounds:

	References	Basis	Claims Challenged
1.	Petit ¹ and Blesener ²	§ 103	1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48
2.	RSAC ³ and Blesener	§ 103	1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48
3.	RSAC, Blesener, and Petit	§ 103	1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48

See Pet. 11. Patent Owner filed a Preliminary Response to the Petition. Paper 8 (“Prelim. Resp.”).

We initially instituted an *inter partes* review on a subset of the challenged claims and asserted grounds. See Paper 10 (“Dec. on Inst.”). Specifically, we determined based on the preliminary record that Petitioner had demonstrated a reasonable likelihood of prevailing in its challenge to claims 1, 4, 14, 16, 19, 28, 42–44, and 44 based on the combination of Ground 3. *Id.* at 24–35. We further determined that Petitioner had not demonstrated a reasonable likelihood of prevailing as to the other claims challenged in Ground 3, or as to the challenges in Grounds 1 and 2. *Id.* at 15–35. Based on those determinations, and in accordance with the Board’s practice at that time, we instituted an *inter partes* review only as to claims 1,

¹ U.S. Patent No. 5,092,544, issued Mar. 3, 1992, Ex. 1008.

² Int’l Pub. No. WO 02/091013 A2, published Nov. 14, 2002, Ex. 1007.

³ Railroad Safety Advisory Committee, *Implementation of Positive Train Control Systems*, Ex. 1005.

4, 14, 16, 19, 28, 42–44, and 44 based on the combination of Ground 3. *Id.* at 35.

Subsequently, pursuant to the holding in *SAS Inst., Inc. v. Iancu*, 138 S.Ct. 1348, 1355–57 (2018), we modified our institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition. Paper 21, 2. We also authorized supplemental briefing to permit the parties to address the newly added claims and grounds. Paper 23, 3–6. After briefing was completed and after the hearing, the parties filed a Joint Motion to Limit the Petition, which requested withdrawal of Ground 2 from consideration in this proceeding. Paper 50. We granted that Joint Motion. Paper 51. Thus, the challenges that remain at issue in this proceeding are Grounds 1 and 3 as listed in the table above.

The merits briefing in this proceeding includes the Petition, a Patent Owner Response (Paper 22, “PO Resp.”), a Patent Owner Supplemental Response (Paper 28, “PO Supp. Resp.”), and a Petitioner Reply (Paper 33, “Reply”). Both parties provided expert testimony in support of their arguments: Petitioner retained Mr. Steven Ditmeyer (*see* Ex. 1002 ¶ 2), and Patent Owner retained Mr. John Loud (*see* Ex. 2004 ¶ 1).

A transcript of the oral hearing is included in the record. Paper 54 (“Tr.”). The record also includes short papers from the parties concerning an exhibit that Patent Owner submitted as supplemental information. *See* Paper 41; Paper 44. Patent Owner moved to exclude certain evidence, which motions we address in Section IV.

We have jurisdiction under 35 U.S.C. § 6. Petitioner bears the burden of proving unpatentability of the challenged claims, and 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 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 not shown by a preponderance of the evidence that any claim of the '461 patent is unpatentable. *See* 35 U.S.C. § 316(e).

A. Related Matters

Patent Owner is asserting the '461 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 (“the Parallel District Court Case”). Pet. vi; Paper 9, 2; Paper 17, 2. The parties also list the following Board proceedings as related matters:

- Case IPR2017-01270, concerning U.S. Patent No. 7,236,860;
- Case IPR2017-01533, concerning U.S. Patent No. 6,845,953; and
- Case IPR2017-01866, concerning U.S. Patent No. 7,036,774.

Paper 9, 2; Paper 17, 1.

B. The '461 Patent

The '461 patent is entitled “Method and System for Ensuring that a Train Does Not Pass an Improperly Configured Device.” Ex. 1001, at [54]. Consistent with that title, the Background of the '461 patent indicates that the invention seeks to improve train safety by avoiding accidents due to improperly set switches or malfunctioning grade crossing gates. *Id.* at 1:13–44. To that end, the '461 patent describes

a computerized train control system in which a control module determines a position of a train using a positioning system such as a global positioning system (GPS), consults a database to

determine when the train is approaching a configurable device such as a switch or grade crossing gate, continuously interrogates the device to determine its status as the train approaches the device, and forces an engineer/conductor to acknowledge any detected malfunction.

Id. at 1:49–57.

Repeatedly interrogating the device as the train approaches is beneficial because it permits detection of malfunctions or changes in configuration after the initial interrogation. *Id.* at 4:3–7. In addition, “it is preferable for the device’s response to include its identification number as this allows for greater assurance that a response from some other source has not been mistaken as a response from the device.” *Id.* at 4:10–14. The ’461 patent also explains that an advantage of interrogating a configurable device as the train approaches is that the device need not transmit information when no trains are in the area, which saves power compared to wayside devices that continuously transmit status information. *Id.* at 5:28–35.

C. Challenged Claims

As noted above, Petitioner challenges claims 1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48.⁴ Of these, claims 1, 14, 28, and 44 are independent claims. Claim 1 is reproduced below, with labels added by Petitioner for ease of reference:

⁴ The Petition references claim 25 in various places (*e.g.*, Pet. 11, 24), but in the body of the Petition, the argument is directed to claim 35 (*see id.* at 45–46, 63). *See* Pet. 11. Since the preliminary stage of this proceeding, Patent Owner has recognized that Petitioner’s challenge is to claim 35, not claim 25. *See* Prelim. Resp. 37, 42. As reflected in our Decision on Institution, we disregard the Petition’s references to claim 25 as typographical errors. *See* Dec. on Inst. 3, n.1.

1. A system for controlling a train, the system comprising:
 - [a] a control unit; and
 - [b] a transceiver, the transceiver being located on the train and being in communication with the control unit;
 - [c] wherein the control unit is configured to perform the steps of
 - transmitting an interrogation message to a configurable device near the train;
 - [d] listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the device;
 - [e] allowing the train to continue if a response with a correct configuration is received within a period of time; and
 - [f] stopping the train otherwise;
 - [g] wherein the control unit is further configured to perform the step of confirming that the identifier received in the response corresponds to the device to which the interrogation message was directed.

Ex. 1001, 5:50–6:2; *see also* Pet. 70 (reproducing claim with labels added).

II. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).

A. “configurable device”

The term “configurable device” appears in each of independent claims 1, 14, 28, and 44, as well as many of their dependent claims. In our Decision on Institution, we construed this term to mean “a wayside device,

such as a switch or crossing gate, that is capable of being in at least two physical states.” Dec. on Inst. 6. In doing so, we noted that the parties had agreed upon this construction in their Parallel District Court Case, and that it was consistent with the description in the Specification. *Id.* In the parties’ briefing after institution, Patent Owner agreed with the construction in our Decision on Institution, and Petitioner did not address the construction of this term. PO Resp. 14; Reply 2. We maintain the construction set forth in our Decision on Institution for the reasons stated therein.

B. “transmitting . . . to a configurable device”

The phrase “transmitting . . . to a configurable device” appears in each of independent claims 1, 14, 28, and 44. In our Decision on Institution, we determined that this phrase does not require direct transmission. Dec. on Inst. 8. In arriving at that determination, we considered whether the prosecution history of the ’461 patent supports an understanding that the phrase requires direct transmission, but we concluded that it does not. *Id.* at 6–8. In the parties’ briefing after institution, Patent Owner agreed with the construction in our Decision on Institution, and Petitioner did not address the construction of this phrase. PO Resp. 14; Reply 2. We maintain the construction set forth in our Decision on Institution for the reasons stated therein.

C. “interrogation message”

The term “interrogation message” appears in each of independent claims 1, 14, 28, and 44, and in several dependent claims. In our Decision on Institution, we construed the term to mean “a request for status information.” Dec. on Inst. 8. After institution, Patent Owner urged, as it had before institution, that we should construe the term as “a targeted

request for status information.” PO Resp. 14–19. Patent Owner pointed out that in the Parallel District Court Case, the court’s construction of this term requires that the request is targeted. *Id.* at 15 n.2 (citing Ex. 2008, 10–12); *see also Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 3126 (Fed. Cir. 2015) (explaining that although the Board is not generally bound by a previous judicial interpretation of a disputed claim term, the Board should nevertheless assess whether it is consistent with the broadest reasonable construction of the term). In its Reply, Petitioner states that Patent Owner’s “proposed construction is acceptable.” Reply 2; *see also* Tr. 8:24–9:1 (Petitioner’s counsel confirming that the parties agree on the construction of this term as a targeted request for status information). We will adopt the parties’ agreed-upon construction, which is also consistent with the construction in the Parallel District Court Case.

Thus, we interpret “interrogation message” to mean “a targeted request for status information.”

III. OBVIOUSNESS ANALYSIS

A. Legal Standards

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 “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 nonobviousness such as “commercial success, long felt but unsolved needs, failure of others, etc.” *Id.* at 17–18; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007). In this case, the

parties did not present any evidence relating to secondary considerations. We discuss the first three *Graham* factors below.

B. Level 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).

In our Institution Decision, we adopted Petitioner’s proposal that an ordinarily skilled artisan at the time of the invention of the ’461 patent “would have had an undergraduate degree or the equivalent thereof and at least five (5) 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 communication systems, and would have understood how to search available literature for relevant publications.” Dec. on Inst. 10 (quoting Pet. 7–8). Following institution, Patent Owner stated its agreement with this definition of the level of ordinary skill in the art. See PO Resp. 19. We maintain the definition of the level of ordinary skill in the art set forth in our Institution Decision for the reasons stated therein. See Dec. on Inst. 10–11.

C. Summary of the Cited Prior Art References

1. Petit

Petit describes a system that controls the operation of crossing protection equipment for a highway crossing on a railroad. Ex. 1008, 1:58–

62. In Petit’s system, a communications link is established between a train approaching the crossing and the crossing equipment. *Id.* at 2:4–6. The first message from the train is initiated when the locomotive passes a beacon transponder located beyond a safe braking distance for trains travelling toward the crossing. *Id.* at 2:32–37. The messages from the approaching train to the crossing equipment include fields for crossing ID, train speed, the train’s distance from the crossing, and other information. *Id.* at 2:10–12, 4:58–67, 5:12–14. The messages from the crossing equipment to the train contain information as to the when the next message from the train is required, as well as minimum time for the train to reach the crossing. *Id.* at 2:12–20, 7:41–57. The approaching train and the crossing equipment can interchange these messages multiple times, with the minimum time being repeatedly updated. *Id.* at [57], 7:64–66.

When the minimum time has expired, the highway crossing gates are activated to drop. *Id.* at 7:67–8:2. Because the gates are activated when the train reaches the crossing, “[t]he time for the gates to be down is then minimized with the advantages of improved vehicular traffic flow over the crossing.” *Id.* at 8:5–8. Petit employs “vital communications logic which activates the protection equipment to its safe condition or sets alarms or brakes in the train in the event of errors or failures in the messages being handled in the crossing controller or in the train equipment. . . .” *Id.* at [57]; *see also id.* at 1:62–68, 6:1–5, 6:58–65, 7:16–19.

2. Blesener

Blesener relates to an “inexpensive, low-power vehicle collision/crossing warning system that enables simple and decentralized installation, operation, and maintenance. . . .” Ex. 1007, 1:14–15. Blesener

describes an embodiment in which a locomotive transmits every four seconds a beacon signal that contains the locomotive's position, speed, direction, and heading. *Id.* at 11:4–7. “Any crossing can listen to any locomotive at all times, if the locomotive is within radio range of the crossing.” *Id.* at 11:8–9. Controller 20 at the crossing decides whether to activate the signal by deciding if the locomotive is approaching the crossing based on the locomotive's location from the beacon. *Id.* at 11:10–15. “Once activation has occurred master controller 20 can optionally notify the locomotive that the crossing is activated.” *Id.* at 11:15–16. When the locomotive has passed, controller 20 deactivates the crossing. *Id.* at 11:20–21.

Blesener's system “uses a Smart Self Updating System (SSUS) to poll the crossing and share the latest systems information. In this way, as the locomotive moves down the track it is also updating itself and all crossings along the line with the latest system information.” *Id.* at 10:5–7. “Each locomotive SSUS contains a database of the status of all known crossings and each crossing controller has a copy of a smaller localized database. Each time a locomotive and crossing interact, the databases are compared and whoever has the latest information, passes this data to the other.” *Id.* at 10:22–25.

Blesener also describes a fail-safe for a broken crossing, which utilizes the GPS systems on board the locomotive and master controller 20. *Id.* at 12:14–19. Because “[t]his data allows the system to know about . . . the location of a crossing and . . . where the locomotive is, the system can cross check if it is approaching a crossing and has not gotten a confirmation that the crossing is activated.” *Id.* at 12:15–18. “Typically the locomotive

does not need to know there is a crossing ahead because, if the crossing is working, the locomotive beacon will cause it to activate. When the crossing activates, it sends geo-location data to the locomotive” and data about the newly discovered crossing is placed in the locomotive’s database. *Id.* at 12:20–25.

3. RSAC

RSAC is a report to the Federal Railroad Administrator describing “the status of efforts to develop, test, demonstrate and deploy Positive Train Control (PTC) systems.” Ex. 1005, vii. RSAC summarizes technological developments relating to PTC functions. *See id.* at 19–34. Of primary relevance to Petitioner’s challenges in this proceeding is RSAC’s description of the Incremental Train Control System (“ITCS”) (*id.* at 25–26, 38, C-4 to C-6).

ITCS includes three major segments, a Wayside Equipment Segment, a Communications Segment, and a Locomotive Segment. *Id.* at 25. The Wayside Equipment Segment includes wayside interface units (WIUs), which monitor switch position and the status of highway rail grade crossings. *Id.* The Communications Segment includes a wide local area network (WLAN), which connects the WIUs to wayside interface unit servers (WIU-Ss) that broadcast digital data messages to trains. *Id.* “The WIU-S broadcasts (open loop) the status reported by the WIUs once every six seconds.” *Id.* at 26. The Locomotive Segment includes an on-board computer (OBC), which “stores a database of signal indications . . . and the locations of all devices with which it may be required to communicate.” *Id.* As the locomotive travels down the track,

[t]he OBC establishes a session with each WIU-S when it enters its zone of coverage, verifies that it has an updated track database

and expects to receive a WIU-S broadcast every six seconds. The OBC can miss two broadcasts without adverse [e]ffects but a missed third broadcast (18 to 20 seconds elapsed time) results in the OBC initiating an automatic brake application, stopping the train.

Id.

RSAC also describes that in ITCS, the OBC continually calculates expected time of arrival at the crossing, and when that time reaches 100 seconds, the OBC transmits its estimated arrival time. *Id.* at C-5.

The server receives the message, arms the crossing to prepare for activation, and sets a delay timer to hold off activation of the crossing until the estimated arrival time has reduced to around 40 seconds. When all this is accomplished, the server then broadcasts the crossing status as armed and ready for hi-speed operation. When the delay time has expired, the server activates the crossing over the WLAN.

Id.

D. Obviousness Challenge Based on Petit and Blesener

Petitioner contends that claims 1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48 are unpatentable under 35 U.S.C. § 103(a) as obvious over Petit and Blesener. Pet. 24–48. Patent Owner disputes those contentions. PO Supp. Resp. 6–22.

Our analysis focuses on limitation [c] of claim 1, which recites that the control unit is configured to “transmit[] an interrogation message to a configurable device near the train.” Ex. 1001, 5:57–58. Substantially the same limitation appears in each of the other independent claims challenged by Petitioner. *See id.* at 6:51–52 (claim 14); *id.* at 7:46–47 (claim 28); *id.* at 8:66–67 (claim 44). Petitioner’s arguments concerning how the combination teaches this limitation in claims 14, 28, and 44 simply refer back to its arguments for the same limitation in claim 1. *See* Pet. 40, 42, 47; Reply 38.

Similarly, Patent Owner groups all of the challenged claims together for the purposes of arguing why Petitioner has not shown that the combination teaches this limitation. *See* PO Supp. Resp. 9–12.

As discussed above in Section II.C., we have adopted the parties’ agreed construction that “interrogation message” means “a targeted request for status information.” We agree with Patent Owner that Petitioner has not established that the cited combination teaches a train transmitting a targeted request for status information to a configurable device near the train.

Petitioner primarily relies on Petit as disclosing this limitation. Specifically, Petitioner points out that in Petit, the “first message from the train is initiated when the train locomotive passes a beacon, which is preferably a beacon transponder interrogated by locomotive-carried equipment.” Pet. 33 (quoting Ex. 1008, 2:31–34). It is this first message that the train sends to the crossing after passing the beacon that Petitioner points to as the “interrogation message.” *Id.* Petitioner contends that “this initial message . . . discloses the claimed ‘interrogation message’ because it is a request for status information.” *Id.* (citing Ex. 1002 ¶ 53).

The record does not support Petitioner’s contention that this initial message in Petit is a request for status information from the crossing. The cited portion of Mr. Ditmeyer’s declaration concerns whether the train communicates directly with the crossing, without intervening communication equipment; it does not address whether the message from the train to the crossing includes a request for status information from the crossing. Ex. 1002 ¶ 53. The Petition itself quotes Petit’s description that train’s message to the crossing “giv[es] loco I.D., speed, direction of approach and distance from crossing.” Pet. 33 (quoting Ex. 1008, Fig. 5B).

None of those items constitute a request for status information from the crossing, and Petitioner does not point to any disclosure in Petit indicating that this message additionally includes a request for status information.

Our review of Petit leads us to agree with Patent Owner's assertion, which is supported by citations to Petit's disclosure and a detailed explanation from Mr. Loud, that the train's message does not request status information from the crossing. PO Supp. Resp. 10 (citing Ex. 2016 ¶¶ 29–31). Petit summarizes that in its system, “messages from the approaching train contain information as to the speed of the approaching train and its distance from the crossing.” Ex. 1008, 2:10–12. When the crossing equipment receives the first message from the approaching train, it computes a minimum time for the crossing equipment to be disposed in its first state, in which highway traffic across the tracks is allowed. *Id.* at 2:2–4, 2:15–19; *see also id.* at 7:41–44. The crossing responds with an acknowledgement message that indicates the minimum time that was calculated. *Id.* at 7:53–56.

The train and crossing then exchange additional messages, with “messages from the crossing equipment to the train contain[ing] information as to the time when transmission of a next successive message from the approaching train is required.” *Id.* at 2:12–15. With each interchange of messages between the train and the crossing, the minimum time is updated. *Id.* at 2:19–22; *see also id.* at 7:64–66. “The crossing equipment is conditioned into its second state [i.e., blocking highway traffic across the tracks] upon expiration of the latest updated minimum time.” *Id.* at 2:22–24; *see also id.* at 1:68–2:2, 7:67–8:3.

This process minimizes the amount of time in which the crossing interferes with the flow of traffic across the crossing. *Id.* at 2:25–26; 8:5–8. Consistent with Petit’s goal of minimizing the time in which the gates are blocking traffic, “the safe condition of the warning devices will only occur when the train reaches the crossing.” *Id.* at 8:4–5. Thus, the system Petit describes does not include messages from the train requesting status information from the crossing or responsive messages from the crossing conveying status information. We find credible Mr. Loud’s testimony that “the *Petit* train neither requests the crossing’s configuration information, nor receives such configuration information in response to its activation message.” Ex. 2016 ¶ 29.

In its Reply, Petitioner provides one short paragraph on this limitation. *See* Reply 38. Petitioner asserts that in Petit, the train’s message to the upcoming crossing contains a source identifier and a destination identifier. *Id.* (citing Ex. 1008, Fig. 5B, 5:12–14). Petitioner further asserts that “Mr. Loud confirmed that a message that causes the sending of a message with a configuration of a configurable device and an identifier of the configurable device is an interrogation message.” *Id.* (citing Ex. 1027, 178:1–2). Again, the record does not support this assertion. Petitioner has not shown that the train’s message in Petit causes the sending of a message from the crossing with the crossing’s configuration, and the cited portion of Mr. Loud’s deposition testimony includes no such confirmation:

[Q.] So I think what I said -- I think I said was, is it true that as a result of the targeted message, the onboard receives status information about the configurable devices connected to the server?

A. And I said no, because it’s not the result of it.

Ex. 1027, 177:22–178:2. Moreover, in this portion of the deposition, Mr. Loud was being asked about the ITCS system in the RSAC reference, not Petit. *Id.* at 176:22–177:5. The RSAC reference is not a part of the combination in this ground.

In an apparent backup position to its reliance on Petit for this limitation, the Petition includes a single sentence arguing that “*Blesener* also teaches that the control unit is configured to transmit an initial (interrogation) message to a configurable device near the train.” Pet. 33 (citing Ex. 1007, 10:5–6). This argument is undeveloped and unpersuasive. The cited portion of *Blesener* describes that “[s]ystem 10 also uses a Smart Self Updating System (SSUS) to poll the crossing and share the latest systems information.” Ex. 1007, 10:5–6. As Mr. Loud points out, *Blesener* does not indicate that any “request for configuration status information is involved as part of that update.” Ex. 2004 ¶ 133. We agree with Patent Owner that Petitioner has not demonstrated that this disclosure indicates that the train sends a request for status information that is targeted to a particular device. PO Supp. Resp. 12; PO Resp. 46–49.

Blesener describes that the train repeatedly sends a beacon signal, which is not directed to any particular crossing. Ex. 1007, 11:4–10. “Typically the locomotive does not need to know there is a crossing ahead because, if the crossing is working, the locomotive beacon will cause it to activate. When the crossing activates, it sends geo-location data to the locomotive, which causes the locomotive to ‘discover’ the presence of the crossing.” *Id.* at 12:20–24. The train can then “propagate this new knowledge” of the crossing throughout the system via SSUS by passing

along this information to each crossing it encounters. *Id.* at 12:26. Thus, we are not persuaded that the operation of the SSUS in Blesener includes the train sending a targeted message to a particular device requesting status information. We credit Mr. Loud’s detailed testimony, which is supported with numerous citations to Blesener, as to why Blesener does not disclose the train transmitting an “interrogation message” under the construction we have adopted. *See* Ex. 2004 ¶¶ 131–138.

Because Petitioner has not established that the cited combination teaches or suggests a train transmitting a targeted request for status information to a configurable device near the train, as required by each of the challenged claims, we determine that Petitioner has not carried its burden of demonstrating by a preponderance of the evidence that any of the challenged claims would have been obvious based on the combination of Petit and Blesener.

E. Obviousness Challenge Based on RSAC, Blesener, and Petit

Petitioner contends that claims 1, 4–6, 14, 16, 17, 19, 28, 32, 35, 42–44, and 48 are unpatentable under 35 U.S.C. § 103(a) as obvious over RSAC, Blesener, and Petit. Pet. 66–68.⁵ Patent Owner presents several

⁵ Petitioner’s challenge in this ground builds on or modifies Ground 2 based on RSAC and Blesener (*see* Pet. 48–66), which predicate ground has been withdrawn from consideration as discussed above in Section I. Specifically, Petitioner relies in this ground on the same arguments presented in the RSAC and Blesener ground, except “modified to include *Petit* for the idea of removing the WIUs of RSAC, [such that] the same communications as described above in Ground 2 occurs with direct transmission from the train to the configurable device instead of through a WIU.” Pet. 66. Thus, the proposed combination in this ground is “identical to the one resulting from the combination of RSAC and Blesener as described in [Ground 2], except the communication between the train and the configurable device

arguments in rebuttal to Petitioner’s obviousness contentions in this ground. See PO Resp. 28–66. As in Section III.D., our analysis below focuses on the limitation reciting “transmitting an interrogation message to a configurable device near the train,” which appears in every challenged independent claim and is dispositive.

Petitioner relies on RSAC’s description of the ITCS system as disclosing this limitation. Pet. 53–54. In particular, Petitioner points to the message the train sends to the crossing when its estimated arrival time reduces to 100 seconds as the claimed “interrogation message.” *Id.* at 53 (citing Ex. 1005, C-5). In our Decision on Institution, we found this argument persuasive insofar as we understood RSAC to indicate that the train’s message triggered a message conveying the status of the crossing as armed. Dec. on Inst. 26 (citing Ex. 1005, C-5). However, based on the full record after trial, we are not persuaded that this disclosure in RSAC teaches a train transmitting a targeted request for status information to a configurable device. See *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (“[T]he Board is not bound by any findings made in its Institution Decision. At that point, the Board is considering the matter preliminarily without the benefit of a full record. The Board is free to change its view of the merits after further development of the record, and *should do so* if convinced its initial inclinations were wrong.”).

RSAC describes that in ITCS, broadcasts indicating the status of devices “are repeated at intervals of approximately 6 seconds. Any train in

would be direct, without the routing functions of a WIU.” *Id.* at 67. Accordingly, in discussing this ground, reference will be made to the parties’ arguments concerning Ground 2 based on RSAC and Blesener.

the area will receive the broadcasts and determine which statuses are relevant to its own location.” Ex. 1005, C-5. Mr. Loud testifies that “messages sending the crossing’s status in ITCS are not ‘triggered’ by any message from the train, but will instead be broadcast every six seconds regardless of anything the train does, or whether a train is even approaching.” Ex. 2004 ¶ 125. Mr. Ditmeyer agrees. In his deposition, Mr. Ditmeyer testified as follows:

Q. Okay. So the WIU-S in ITCS will broadcast the status of all wayside devices that it’s monitoring every six seconds, correct?

A. Right.

Q. That’s regardless of whether a train is approaching or not, right?

A. Right.

Ex. 2006, 93:10–16.

Q. Does the description of ITCS in the RSAC Report describe the WIU-Ss sending status signals specifically in response to a signal from an incoming train?

A. No.

Q. They’re just broadcast every six seconds?

A. Right.

Id. at 94:24–95:6.

There is no indication in RSAC that the train’s estimated arrival time message to the crossing includes a request for status information. RSAC describes:

The server receives the message, arms the crossing to prepare for activation, and sets a delay timer to hold off activation of the crossing until the estimated arrival time has reduced to around 40 seconds. When all this is accomplished, the server then broadcasts the crossing status as armed and ready for hi-speed operation.

Ex. 1005, C-5. Thus, the train's arrival time estimate triggers an activation process that results in activation of the crossing approximately sixty seconds later. Based on our review of RSAC, we find credible Mr. Loud's explanation of ITCS's operation. Specifically, Mr. Loud testifies that during that intervening minute, the train will continue to receive the broadcast status messages every six seconds, just as it would if it had not sent an arrival time estimate message. Ex. 2004 ¶ 126; *see also* Ex. 2006, 93:10–16. After the crossing is armed, the same periodic broadcasts reflect the crossing's status as armed. Ex. 2004 ¶ 126. We credit Mr. Loud's testimony that

while an approaching train in ITCS may be able to influence the content of a status message (*e.g.*, causing the status for a crossing to change to “armed”), it cannot influence in any way whether or when a status message is transmitted to the train. Thus, the activation message from the train in ITCS cannot fairly be characterized as a “request for status information.”

Id. ¶ 127.

In its Reply, Petitioner argues that “the ITCS system requires that the train establish a session with each WIU-S as the train travels along the track” and “[o]nly after the session is established does the OBC know that it should be expecting to receive certain messages, one of which is a status message that is expected after the crossing has been activated. . . .” Reply 20 (citing Ex. 1005, 26, C-5; Ex. 1027, 153:11–155:24). To the extent Petitioner is arguing that the train's establishment of a session with the WIU-S (or directly with the device) constitutes the claimed “interrogation message,” that theory was not presented in the Petition. *See* Tr. 21:10–22:4. “It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence

that supports the grounds for the challenge to each claim.”” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)). Consistent with that requirement, the Federal Circuit’s “precedent supports the Board’s discretion to reject arguments raised for the first time in a reply.” *Ericsson Inc. v. Intellectual Ventures I LLC*, ___ F.3d ___, 2018 WL 4055815, at *6 (Fed. Cir. 2018) (citing *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359 (Fed. Cir. 2015)). Even if Petitioner’s reply argument is not an improper new argument, we are not persuaded that the establishment of a communication link constitutes a request for status information.

Petitioner’s Reply further argues that Patent Owner is “attempt[ing] to read in limitations, such as the requirement that no other messages are received by the” on board computer. Reply 22. We do not understand Patent Owner to argue that intervening messages between the train’s activation message and the crossing’s status message preclude the activation message from being an “interrogation message.” Rather, as detailed above, we understand Patent Owner and Mr. Loud to be emphasizing that the status broadcasts recur every six seconds regardless of whether any activation message is sent, which reinforces that the activation message is not a request for the device’s status.

Relatedly, Petitioner argues that “the fact that the message serves multiple purposes does not preclude the message from being the claimed interrogation message.” Reply 23 (citing Ex. 1030; Ex. 1031). Yet Petitioner has not established that in ITCS, the train’s estimated arrival time message serves multiple purposes. As discussed above, our review of RSAC and the expert testimony concerning RSAC leads us to find that this arrival

time message serves an activation purpose and that RSAC does not indicate that this message serves an interrogation purpose.

For the foregoing reasons, Petitioner has not established that the cited combination teaches or suggests a train transmitting a targeted request for status information to a configurable device near the train, as required by each of the challenged claims. In view of this deficiency, we determine that Petitioner has not carried its burden of demonstrating by a preponderance of the evidence that any of the challenged claims would have been obvious based on the combination of RSAC, Blesener, and Petit.

IV. PATENT OWNER'S MOTIONS TO EXCLUDE

A. Exhibit 1031

Patent Owner moves to exclude Exhibit 1031, which is an excerpt from the Opening Expert Report of Dr. Nabil N. Ghaly Concerning Infringement in the Parallel District Court Case. *See* Paper 37, 1. Patent Owner argues that the excerpt is irrelevant under Federal Rule of Evidence 402 because it concerns infringement, and further that its probative value is outweighed by the danger of it being misleading under Federal Rule of Evidence 403 because the short excerpt omits surrounding context. *Id.* Petitioner opposes the motion to exclude, arguing that the exhibit is relevant because “it indicates what (at least one of) [Patent Owner]’s experts believe is sufficient disclosure to meet various limitations of various claims under review here” and that the excerpt was not an attempt to hide any aspect of Dr. Ghaly’s statements but simply to highlight the most pertinent aspects. Paper 38, 1–2, 4.

We are doubtful that Exhibit 1031 is subject to exclusion under Rules 402 or 403. Petitioner’s use of the exhibit in an attempt to show

inconsistency between Patent Owner's arguments in this proceeding and the Parallel District Court Case would seem to clear the hurdle for relevance without being unduly prejudicial, particularly in the context of a proceeding in which both fact-finding and legal analysis is carried out by a panel of administrative patent judges. However, it is unnecessary to resolve this evidentiary dispute because we have determined that Patent Owner prevails even without excluding Exhibit 1031. Thus, we dismiss as moot Patent Owner's motion to exclude Exhibit 1031.

B. Exhibit 1040

Patent Owner also moves to exclude Exhibit 1040, which is the Opening Expert Report of Dr. Lori Kaufman Concerning Invalidity in the Parallel District Court Case. *See* Paper 52, 1. Patent Owner argues that Exhibit 1040 constitutes inadmissible hearsay under Federal Rule of Evidence 801 and is irrelevant and unduly prejudicial under Rules 402 and 403. *Id.* at 2–5. Petitioner opposes the motion, countering that Exhibit 1040 is not relied upon for the truth of the assertions therein but provides the full context of the testimony from Dr. Kaufman that Patent Owner submitted. Paper 49, 4.

A brief summary of Dr. Kaufman's role in this proceeding vis-à-vis the Parallel District Court Case is helpful to understand this dispute. Petitioner did not submit testimony from Dr. Kaufman with its Petition or its Reply. As discussed above, Petitioner relied on Mr. Ditmeyer as its technical expert in this proceeding. *See* Ex. 1002. After Petitioner's Reply, Patent Owner filed as supplemental information Exhibit 2020, which is an excerpt of the deposition of Dr. Kaufman from the Parallel District Court Case. In a paper filed concurrently with that supplemental information,

Patent Owner argued that Dr. Kaufman's deposition testimony contradicted positions taken by Petitioner in this proceeding. Paper 41, 1–2. In a responsive paper, Petitioner argued that Petitioner misapprehended Dr. Kaufman's testimony and took certain statements out of context. Concurrently with that response, Petitioner submitted Exhibit 1040.

With this background in mind, the materials relating to Dr. Kauffman's opinions and testimony in the Parallel District Court Case do not have a significant role in our analysis in this proceeding. Petitioner did not present any opinion or testimony from Dr. Kauffman in this proceeding, and it has made clear that it is not relying on Dr. Kauffman's testimony to support its obviousness contentions in this proceeding. See Paper 49, 4 (Petitioner stating that it "has never asserted that any of the various grounds of invalidity set forth by Dr. Kaufman in her report or in deposition should be imported into this Trial"). Accordingly, our analysis above focuses on the arguments and evidence that Petitioner presented to support its obviousness contentions, and does not cite or rely on the materials relating to Dr. Kauffman's opinions and testimony. Because we do not rely on the materials that are the subject of the motion, and because we have determined that Patent Owner prevails even without excluding Exhibit 1040, we dismiss as moot Patent Owner's motion to exclude Exhibit 1040.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has not shown that the challenged claims are unpatentable;

FURTHER ORDERED that Patent Owner's Motions to Exclude Exhibits 1031 and 1040 are dismissed as moot; 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.

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