

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SIEMENS MOBILITY, INC., GROUND TRANSPORTATION SYSTEMS USA,
INC., HUMATICS CORP., and PIPER NETWORKS, INC.
Petitioners,

v.

METROM RAIL, LLC
Patent Owner

Case No. IPR2023-00470
Patent No. 8,812,227

PATENT OWNER'S PRELIMINARY RESPONSE

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EXHIBIT LIST

Exhibit #	Description
2001	Garcia, Cristina & Lehner, Andreas & Strang, Thomas & Rockl, Matthias. (2007). Comparison of Collision Avoidance Systems and Applicability to Rail Transport. 1 - 6. 10.1109/ITST.2007.4295927.

I. INTRODUCTION

Patent Owner Metrom Rail, LLC (“PO” or “Metrom”) submits this preliminary response to the Petition filed by Siemens Mobility, Inc., et al. (“Petitioners”) requesting *inter partes* review of claims 1-28 (the “Challenged Claims”) of U.S. Pat. No. 8,812,227 (the “227 Patent”).

The Petition fails to demonstrate a reasonable likelihood that the Challenged Claims of the 227 Patent are unpatentable. Each of the asserted prior art references differs significantly from the inventions claimed by the 227 Patent, and claim limitations are missing from each of the asserted prior art references. To make up for the deficiencies of the prior art references, the Petition relies on conclusory assertions made by Petitioner’s expert, Mr. Andrews, in his declaration (EX1003).

Petitioner has not carried its burden of showing that the Challenged Claims are likely unpatentable. Therefore, the Board should decline instituting trial on each of the seventeen proposed obviousness Grounds.

II. SUMMARY OF THE 227 PATENT

The 227 Patent is directed to a collision avoidance system for the railroad industry. The 227 Patent explains that “previous systems for preventing collisions of rail line vehicles have typically utilized a single sensor, for example a GPS or radar-based sensor, to monitor the approximate location of rail mounted vehicles.” EX1001 at 2:57-60. These previous systems had numerous limitations. The

inventors of the '227 Patent overcome these limitations by designing a collision avoidance system for rail line vehicles that utilize a combination of sensor technologies, including an Ultra Wideband (UWB) sensing technology, to counter the limitations of previous systems, and to significantly reduce the potential for vehicle collisions and to enhance the safe operation of a variety of railway vehicles. EX1001 at 3:28-34.

III. CLAIM CONSTRUCTION

Patent Owner does not waive its right to propose constructions for one or more claim terms at a later time.

IV. LEVEL OF ORDINARY SKILL IN THE ART

A. Petitioner's level of ordinary skill in the art is incorrect

The Petition asserts that a POSITA “would have at least two years of experience with using such electronics for control systems applications such as collision-avoidance systems or positioning systems.” Paper 5 at 7. For the reasons set forth below, the Petition's definition of a POSITA is incorrect.

Petitioner's Expert, Mr. Andrews, acknowledges, that “the '227 patent relates to collision avoidance systems for rail-line vehicles within a railway network.” EX1003 at ¶ 30. Importantly, each of the Challenged Claims are directed to collision avoidance systems for “rail vehicles.” *See e.g.*, Claim 1. Thus, the relevant field at the time the invention was made was “collision avoidance systems for rail-line

vehicles within a railway network” and accordingly, a POSITA would be one with experience in collision avoidance systems for rail-line vehicles.

The Petition however asserts that a POSITA would have experience in “collision-avoidance systems or positioning systems,” generally. Paper 5 at 7. Petitioner’s definition would include persons who have experience in collision-avoidance systems including but not limited to road transportation systems, railway transportation systems, etc. However, railway transportation systems differ considerably from road and other transportation systems. *See e.g.*, EX2001 at p. 4 (“Road transport behavior differs considerably from the railway transport, the high density of vehicles on roads that allows network extension through multihop cannot be assumed in railway transport.”). And “railway transportation characteristics add major difficulties” when developing a collision-avoidance systems. *Id.* A person with experience only in roadway collision-avoidance systems would be unable to account for the technical challenges presented by railway systems when designing a railway collision-avoidance systems. Further, such a person would also not appreciate the technical differences between roadway and railway collision systems. However, under the Petition’s over-broad definition, such a person would incorrectly qualify as a POSITA in the field of collision avoidance systems for rail-line vehicles. For this reason, the Petition’s definition of a POSITA should be rejected.

B. The correct level of ordinary skill in the art

To account for and acknowledge the differences between the collision avoidance systems for the different modes of transportation, the Petition's definition of a POSITA should be modified to as follows:

POSITAs would have had a background in wireless electronics, including at least a bachelor's degree in electrical engineering or a related field, and would have at least two years of experience with using such electronics for control systems applications such as railway collision-avoidance systems or railway positioning systems.

(emphasis added).

C. Mr. Andrews is not a POSITA

As evidenced by Mr. Andrews' CV, Mr. Andrews has no experience in collision avoidance systems for rail-line vehicles. *See generally* EX1004. To the extent Mr. Andrews' has any technical experience in collision avoidance systems, such experience relates to road transportation systems and not railway transportation systems. However, railway transportation systems differ considerably from road transportation systems. *See e.g.*, EX2001 at p. 4 ("Road transport behavior differs considerably from the railway transport, the high density of vehicles on roads that allows network extension through multihop cannot be assumed in railway transport."). Because of Mr. Andrews' lack of experience in the field of railway collision avoidance systems, Mr. Andrews is not "a person of ordinary skill in the relevant field at the time the invention was made."

D. Mr. Andrews' opinions should be discounted

Owing to his lack of experience in the area of railway collision avoidance systems, Mr. Andrews cannot appreciate the *differences* between collision avoidance systems for railway systems, *i.e.*, the 227 patent, and roadway systems. In fact, Mr. Andrews demonstrates that he does not appreciate these *differences* when he freely combines teachings from two, three and sometimes even four prior art references, where some of the references relate to roadway collision systems, *e.g.*, Suzuki (EX1005), and others relate to railway collision systems, *e.g.*, Grisham (EX1006). *See also*, Ground 1C (combining EX1006 (railway art) with EX1008 (semi-autonomous vehicle art)). In fact, Mr. Andrews goes so far as to say that “both automobiles and rail-line vehicles face the same or similar problem of avoiding collisions[.]” EX1003 at ¶263. Worse yet, as explained below, Mr. Andrews frequently provides no evidence to support his assertions. Because under the correct definition, Mr. Andrews is not a POSITA, Mr. Andrews' opinions should be discounted and accorded no weight.

V. NO REVIEW SHOULD BE INSTITUTED WITH RESPECT TO THE GROUNDS RAISED BY PETITIONER

The Petition fails to establish a reasonable likelihood that the Challenged Claims are unpatentable. The Petition proposes these seventeen grounds against the 227 Patent:

- **Ground 1A – obviousness in view of Grisham (cls. 1, 11, 14)**

- **Ground 1B – obviousness in view of Grisham and Douglas (cls. 2-4)**
- **Ground 1C – obviousness in view of Grisham and Richardson (cls. 5-6)**
- **Ground 1D – obviousness in view of Grisham and Breed ‘945 (cls. 12-13)**
- **Ground 1E – obviousness in view of Grisham and Connell (cl. 15)**
- **Ground 2A – obviousness in view of Grisham and Nixon (7-9, 17-19, 21, 24-26)**
- **Ground 2B – obviousness in view of Grisham, Richardson, and Douglas (cl. 20)**
- **Ground 2C – obviousness in view of Grisham, Nixon, and Douglas (cl. 22, 27-28)**
- **Ground 2D – obviousness in view of Grisham, Nixon, and McDaniel (cl. 10)**
- **Ground 2E – obviousness in view of Grisham, Nixon, McDaniel, and Connell (cl. 16)**
- **Ground 2F – obviousness in view of Grisham, Nixon, McDaniel,, Connell, and Breed ‘945 (cl. 23)**
- **Ground 3A – obviousness in view of Suzuki; in the alternative,**

Suzuki in combination with Grisham (cls. 1, 7-8, 11-14, 17-19, 24-25)

- **Ground 3B - obviousness in view of Suzuki and Richardson; in the alternative, Suzuki in combination with Grisham and Richardson (cls. 2-6, 20, 22, 27-28)**

- **Ground 3C - obviousness in view of Suzuki and Nixon; in the alternative, Suzuki in combination with Grisham and Nixon (cls. 9, 21, 26)**

- **Ground 3D – obviousness in view of Suzuki and Connell; in the alternative, Suzuki in combination with Grisham and Connell (cl. 15)**

- **Ground 3E – obviousness in view of Suzuki, Nixon, and McDaniel; in the alternative, Suzuki in combination with Grisham, Nixon, and McDaniel (cl. 10)**

- **Ground 3F – obviousness in view of Suzuki, Nixon, McDaniel, and Connell; in the alternative, Suzuki in combination with Grisham, Nixon, McDaniel, and Connell (cls. 16, 23)**

The cited references do not, individually or collectively, disclose, teach, or suggest all of the elements of the Challenged Claims, including the independent claims 1, 17, and 24. Where none of the references discloses an element of the claims, *inter partes* review for obviousness cannot be instituted. *See CustomPlay, LLC v. ClearPlay, Inc.*, IPR2013-00484, Paper 29 at 12-13 (P.T.A.B. Nov. 5, 2014) (claims not unpatentable where none of the asserted prior art references disclosed a

claim element).

Separately, the Petition repeatedly resorts to the understanding of a POSITA to argue that the missing claims elements or limitations would have been obvious. *See e.g.*, Paper 5 at 13 (“a POSITA would understand Grisham’s impulse radios in the transceiver unit (first transponder sensor module) and its antenna are ‘a first radio communication unit’ and ‘a first antenna’ as claimed.”). In some instances, Petitioners’ support for these arguments is Mr. Andrews’ Declaration (EX1003). However, Mr. Andrews’ Declaration frequently “offers only a *verbatim* restatement of the assertion being supported, without any supporting evidence or technical reasoning.” *Xerox Corp., Acs Transp. Sols., Inc., Xerox Transp. Sols., Inc., Conduent Inc., & New Jersey Transit Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 16 (P.T.A.B Aug. 24, 2022) (Precedential). This is troublesome because a review of Mr. Andrews’ qualifications reveals no skill or experience in the art of rail line vehicles or railroad signaling. EX1004. The Director has held that failure to provide supporting evidence or technical reasoning “is particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art.” *Xerox Corp.*, IPR2022-00624, Paper 9 at 16. In such situations, *inter partes* review for obviousness cannot be instituted.

Further, “[a]n obviousness analysis requires more than simply showing that

each limitation is found in the prior art.” *Jacobs Corp. v. Genesis III, Inc.*, IPR2014-01267, Paper 12 at 8 (P.T.A.B. Jan. 22, 2015). “Petitioner must also show ‘whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.’” *Id.* “Petitioner must set forth sufficient articulated reasoning with rational underpinning to support its proposed obviousness ground.” *SAS Institute, Inc. v. Complementsoft, LLC*, IPR2013-00581, Paper 15 at 12 (P.T.A.B. Dec. 30, 2013). The Petition “has failed to address this latter, ‘reason to combine’ portion of the obviousness analysis.” *Jacobs*, IPR2014-01267, Paper 12 at 8; *see also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016) (holding that “[t]he reasonable expectation of success requirement refers to the likelihood of success in combining references to meet the limitations of the claimed invention” and “one must have a motivation to combine accompanied by a reasonable expectation of achieving what is claimed in the patent-at-issue.”). The Petition fails to set forth sufficient articulated reasoning with rational underpinning to support its proposed obviousness grounds and *inter partes* review should not be instituted.

For the foregoing reasons and as further discussed below, the Petition does not establish a reasonable likelihood that the Challenged Claims are unpatentable, and the Board should therefore not institute an *inter partes* review.

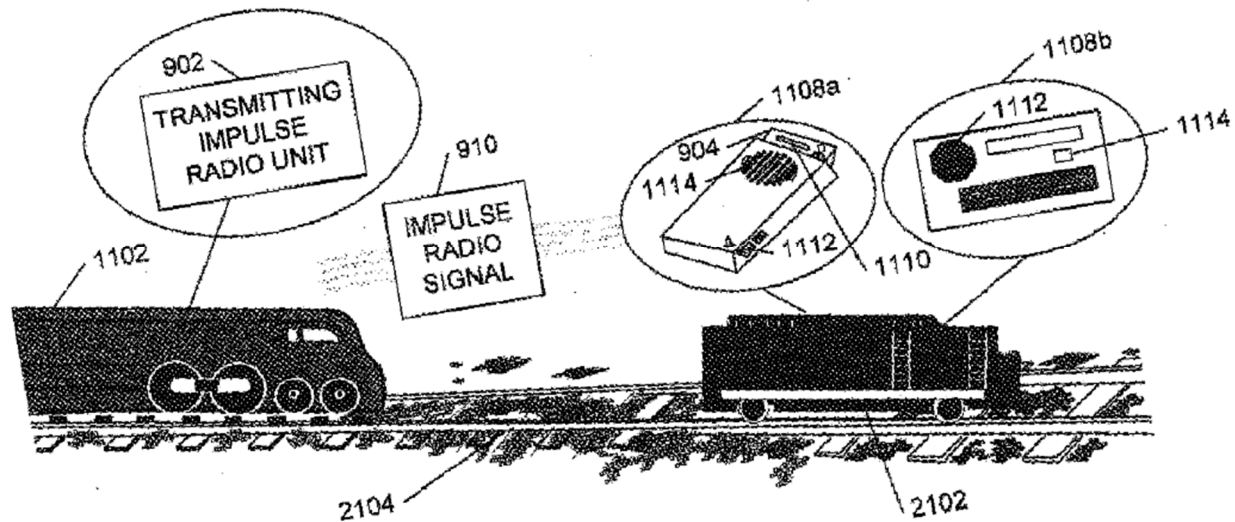
A. Ground 1A: Obviousness of Claims 1, 11, and 14 in view of Grisham

Claim 1 is independent and claims 2-16 depend from claim 1. Petitioners contend that Grisham renders claim 1 obvious. *See* Paper 5 at 9. Although, “[i]n appropriate circumstances, a patent can be obvious in light of a single prior art reference,” a Petitioner must nevertheless show that “it would have been obvious to modify that reference to arrive at the patented invention.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) (emphasis added). Separately, “[w]hen obviousness is based on a particular prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference.” *B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582 (Fed. Cir. 1996). The Petition does neither. *See* Paper 5 at 11-19. Separately, the Petition asserts that Grisham “was not cited during prosecution” and that a “different Grisham reference was of record.” Paper 5 at 9. This is a distinction without difference. The “different Grisham reference [that] was of record” is a continuation application of Grisham (EX1006).

1. Claim 1: Grisham does not disclose or suggest one or more vehicle mounted modules . . . comprising a transponder sensor module operable to send and receive data wirelessly

The Petition asserts that “[a]s shown in Figures 21 and 22 below, Grisham discloses a radio unit 902 that is coupled (mounted) at step 2202 to a locomotive 1102 (rail vehicle).” Paper 5 at 11. The Petition alleges that “Grisham discloses a transmitting impulse radio unit 902 and a receiving impulse radio unit 904 that send and receive signals (send and receive data wirelessly).” *Id.* at 12. The Petition

mischaracterizes Grisham. As shown in Fig. 21 below, radio unit 902 mounted on rail vehicle 1102 is merely a “transmitting impulse radio unit” and radio unit 904 mounted on rail vehicle 2102 is merely a “receiving impulse radio unit.”



The transmitting impulse radio unit 902 is operable to **only send** an impulse radio signal wirelessly; the transmitting impulse radio unit 902 is not “operable to send **and** receive data wirelessly,” as required by claim 1. The receiving impulse radio unit 904 is operable to only receive an impulse radio signal wirelessly; the receiving impulse radio unit 904 is not “operable to send **and** receive data wirelessly,” as required by claim 1. Grisham does not disclose “one or more vehicle mounted modules. . . each vehicle mounted module comprising: a transponder sensor module operable to send **and** receive data wirelessly.”

The Petition alleges that the transmitting impulse radio unit and the receiving impulse radio unit 904 “can be combined into a transceiver impulse radio unit . . .

that sends and receives data wirelessly, thereby achieving ‘substantial economy’ over separate transmit/receive impulse radios.” Paper 5 at 12. As an initial matter, the Petition does not support this conclusion with any citation to its expert, Mr. Andrews, and it should be accorded no weight. *Enzo Biochem, Inc. v. Gen-Probe, Inc.*, 424 F.3d 1276, 1284 (Fed. Cir. 2005) (“Attorney argument is no substitute for evidence.”). Also, Grisham does not disclose or suggest that the transmitting impulse radio unit 902 and the receiving impulse radio unit 904 are combined or can be combined into a single module that is then mounted in a rail vehicle, as required by claim 1. And the Petition articulates no motivation to combine the two radio units into a single module for use in a rail vehicle or show there would be a reasonable expectation of success in arriving at the claimed invention.

2. Claim 1: Grisham does not disclose or suggest a user interface module including a user interface, the user interface being operable to provide rail vehicle information to the vehicle operator and to receive input from the vehicle operator

Grisham does not disclose the claimed user interface operable to provide rail vehicle information to the vehicle operator and to receive input from the vehicle operator. Instead as recognized by the Petition, Grisham merely discloses an after-market display or an in-dash-display. Paper 5 at 14. The Petition does not contend that an after-market display or an in-dash-display are operable “to receive input from the vehicle operator.” Instead, the Petition contends that “[a] POSITA also would have understood that it was conventional for displays, including ‘aftermarket’

displays, to receive user input, such as adjustments to the display's settings." Paper 5 at 14 (citing EX1003, ¶118). The Petition cites to its expert, Mr. Andrews, who "merely repeats, verbatim, the conclusory assertion for which it is offered to support." See EX1003 at ¶118 ("A POSITA also would have understood that it was conventional for a display, including an 'after-market' display, to receive user input, such as adjustments to the display's settings."). Mr. Andrews, however, "does not cite to any additional supporting evidence or provide any technical reasoning to support his statement." *Xerox Corp.*, IPR2022-00624, Paper 9 at 16. For example, Mr. Andrews does not cite to a product brochure or a datasheet for such a display. As the Director has recognized, conclusory assertions are "particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art." *Id.* Accordingly, Mr. Andrews' conclusory assertion should be accorded no weight.

For these reasons, Grisham does not disclose all the limitations of claim 1.

3. Claim 11: Grisham does not disclose "at least one ground speed detection module operable to determine the speed of the rail vehicle, wherein the first vehicle mounted module communicates with the at least one ground speed detection module"

Claim 11 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable. Additionally, as explained below, the

Petition does not show that Grisham disclose[s] a first ground speed detection module. The entirety of Petitioner's argument is contained in a single paragraph. *See* Paper 5 at 16-17. The Petition then cites to the Andrew Declaration to support its threadbare argument. Mr. Andrews' analysis of the combination of prior art is not reflected in the Petition itself, and cannot be incorporated in the Petition by reference. *See* 37 C.F.R. § 42.6(a)(3) ("Arguments must not be incorporated by reference from one document into another document."); *Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 7–10 (P.T.A.B. Aug. 29, 2014) (informative) (noting that "[o]ne purpose of the prohibition against incorporation by reference is to eliminate abuses" of the page limits established for the parties' substantive papers, and that citing "large portions of another document, without sufficient explanation of those portions, amounts to incorporation by reference"). Thus, the Petition does not establish the likely unpatentability of claim 11.

4. Claim 14: Grisham does not disclose wherein the ultra wideband unit is adapted to transmit and receive signals with varying center frequencies

Claim 14 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable.

As an initial matter, the entirety of Petitioner's argument is in a single paragraph consisting of two sentences. *See* Paper 5 at 17. The Petition then cites to the Andrews Declaration to support its threadbare argument. Again, Mr. Andrews'

analysis of the combination of prior art is not reflected in the Petition itself, and cannot be incorporated in the Petition by reference. *See* 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”); *Cisco Sys.*, IPR2014-00454, Paper 12 at 7–10 (informative) (noting that “[o]ne purpose of the prohibition against incorporation by reference is to eliminate abuses” of the page limits established for the parties’ substantive papers, and that citing “large portions of another document, without sufficient explanation of those portions, amounts to incorporation by reference”). At least for this additional reason, the Petition does not establish the likely unpatentability of claim 14.

Additionally, as explained below Grisham does not disclose that the ultra wideband unit is adapted to transmit and receive signals with varying center frequencies when used in the claimed collision avoidance system of claim 1. The ultra wideband unit of Claim 14 “is adapted to transmit and receive signals with varying center frequencies.” The 227 Patent explains that varying center frequencies means transmitting “multiple pulses/signals with different center frequencies at different times.” EX1001 at 16:18-20. In Grisham, “the center frequency is set at calibration to the desired center frequency.” *Id.* at 16:25-26. Grisham does not disclose or suggest claim 14.

The Petition asserts that “[a] POSITA would have understood this teaching of

Grisham to mean its radio units were designed to transmit and receive ultrawide-band signals with varying center frequencies.” Paper 5 at 17. The Petition attempts to support this conclusory assertion by citing to its expert, Mr. Andrews. *See* Paper 5 at 17 (citing EX1003 at ¶¶128-131). Mr. Andrews, however, repeats materially the same conclusory assertion. EX1003 at ¶130 (“While this teaching is specifically directed at varying the pulse repetition rate, it is my opinion that given the teaching of Grisham above, a POSITA would understand that UWB systems *could* be operated with variable center frequencies.”) (emphasis added). Mr. Andrews does not explain why a POSITA would understand the teachings in “Grisham to mean its radio units were designed to transmit and receive ultrawide-band signals with varying center frequencies.” Paper 5 at 17. Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). Mr. Andrews’ conclusory assertion is particularly problematic because it is being used to “supply a missing limitation.” The Petition fails to establish that claim 14 is unpatentable in view of Grisham.

Mr. Andrews also asserts that “[i]t would be obvious to try a variable center frequency because it would allow more frequency diversity in the transmitted signal which in some situations is desirable[.]” EX1003 at ¶131. Mr. Andrews however

does not identify the specific situations in which “allowing[ing] more frequency diversity in the transmitted signal . . . is desirable.” Mr. Andrews also does not explain why “a variable center” “would allow more frequency diversity in the transmitted signal.” “Untethered to any supporting evidence, much less any contemporaneous evidence, [Mr. Andrews’] *ipse dixit* declaration fail[s] to provide any meaningful explanation for why one of ordinary skill in the art would be motivated to” modify Grisham at the time of this invention. *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (citing *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1353-54 (Fed. Cir. 2014)). Mr. Andrews’ “conclusory statements and unspecific expert testimony” will thus be inadequate to support the Board’s fact-finding regarding motivation to modify Grisham. *See TQ Delta*, 942 F.3d at 1362.

There is no reasonable likelihood that the Petitioner would prevail regarding claim 14.

B. Ground 1B: Obviousness of Claims 2, 3 and 4 over Grisham and Douglas

Claim 2 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable.

Additionally, claim 2 recites that “the central tracking unit is operable *to track the location* of at least the first vehicle mounted module and the second vehicle mounted module,” and is not unpatentable because neither Douglas nor Grisham

discloses this claim limitation. (emphasis added). The Petition appears to recognize that neither Grisham nor Douglas expressly discloses a central tracking unit operable to track locations of vehicle mounted module. To address this deficiency, the Petition asserts that “[b]ecause list of links to be traversed by and the direction of motion of each train disclose the path of trains, a POSITA would *understand* Douglas’ station-based apparatus tracks the location of the trains by repeatedly updating the trains’ paths.” Paper 5 at 18 (emphasis added). However, neither the Petition nor Mr. Andrews explains why a “POSITA would understand [that] Douglas’ station-based apparatus tracks the location of the train” based on “the direction of motion of each train.” Mr. Andrews “does not cite to any additional supporting evidence or provide any technical reasoning to support his statement.” *Xerox Corp.*, IPR2022-00624, Paper 9 at 16. As the Director has recognized “[t]his is particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art.” *Id.* The Board should disregard the Petition’s conclusory assertion.

Separately, the Petition fails to explain why a POSITA would have a reasonable expectation of success at arriving at the claimed invention by combining Grisham’s train-to-train-communication embodiment with Douglas’ system. Specifically, claim 2 recites that “the central tracking unit is operable to track the location of at least the first vehicle mounted module and the second vehicle mounted

module.” “The reasonable expectation of success requirement refers to the likelihood of success in combining references to meet the limitations of the claimed invention.” *Intelligent Bio-Sys.*, 821 F.3d at 1367. The Petition fails to explain how a location of the first vehicle mounted module *and* a location of the second vehicle mounted module can be tracked based on “list of links to be traversed by and the direction of motion of each train disclose the path of trains.” There is no reasonable likelihood that the Petitioner would prevail regarding claim 2.

Claims 3 and 4 depend from claim 2 and are not unpatentable at least for the same reasons that claims 1 and 2 are not unpatentable.

C. Ground 1C: Obviousness of Claims 5 and 6 over Grisham in Combination with Richardson

Claims 5 and 6 depend from claim 1 and are not unpatentable at least for the same reasons that claim 1 is not unpatentable.

Additionally, claim 5 recites “wherein the first vehicle mounted module further comprises an auxiliary transponder sensor module, the auxiliary transponder sensor module mounted on the first rail vehicle with an offset with respect to the transponder sensor module,” and is not unpatentable because neither Grisham nor Richardson discloses this claim limitation. Petitioner asserts that “POSITAs would have understood the benefits of Richardson’s provision of *an auxiliary transponder sensor module with an offset* to the transponder sensor module, including better location measurements and improved collision avoidance due to more precise

information relating to length of the vehicle and mounting location of each sensor as is described and depicted in Richardson.” Paper 5 at 22-23. Petitioner states that “POSITAs would have been motivated to supplement Grisham’s single-UWB-transceiver-based system with other vehicle proximity detection systems, including Richardson’s use of multiple UWB transceivers, **that can account for the length of a train**, particularly to prevent collisions at both the front and rear of the trains.” *Id.* at 23.

As an initial matter, Richardson’s system is directed to “improving navigational capabilities and safety operations for semi-autonomous systems” such as “construction and agricultural vehicles.” EX1008 at Abstract. Petitioner fails to explain how and whether Richardson’s system could apply to trains. Richardson’s system cannot “account for the length of a train,” as Petitioner suggests, at least because, as Petitioner admits, “the trains contemplated by Grisham can be quite long (*e.g.*, over a mile)” (Paper 5 at 23) whereas the system of Richardson is designed for uses between 2 meters and 40 meters. *See* EX1008 at Abstract, p. 2 (“A measurement campaign was conducted that collected data in an open, forested and urban channels at distances between 2 m and 40 m.”). Richardson’s use of multiple UWB transceivers would be incompatible with the system of Grisham.

Additionally, claim 6 recites “wherein the auxiliary transponder sensor module comprises an auxiliary antenna, the auxiliary antenna being connected to at

least one of the first ultra wideband unit or an auxiliary ultra wideband unit and wherein the auxiliary antenna is mounted on the first rail vehicle with an offset with respect to the first antenna,” and is not unpatentable because neither Grisham nor Richardson discloses this claim limitation for the same reasons discussed above regarding claim 5.

Petitioner’s purported motivation to combine Grisham with Richardson is merely conclusory and should be rejected. Specifically, Petitioner states that “POSITAs would have been motivated to supplement Grisham’s single-UWB-transceiver-based system with other vehicle proximity detection systems, including Richardson’s use of multiple UWB transceivers, that can account for the length of a train, particularly to prevent collisions at both the front and rear of the trains.” Paper 5 at 23. For support, Petitioner cites only to Mr. Andrews’ Declaration. Mr. Andrews’ Declaration, however, provides a series of unsupported conclusions without citation to any underlying facts. It “is entitled little or no weight.” *Xerox*, IPR2022-00624 at Paper 9, p. 15 (citing 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”))). Furthermore, just because a POSITA *could* have combined Richardson with Grisham does not mean that a POSITA *would* have done so. *Auris Health, Inc. v. Intuitive Surgical Operations, Inc.*, 32 F.4th 1154, 1158 (Fed. Cir. 2022) (“The motivation-to-combine inquiry asks whether a skilled artisan

‘not only could have made but would have been motivated to make the combinations.’”); *3Shape A/S v. Align Tech., Inc.*, IPR2019-00152, Paper 43 at 26 (P.T.A.B. Jul. 16, 2020) (“The law ... require[s] Petitioner to show not only that a [POSITA] could have combined the references in the proposed manner, but that a [POSITA] would have had a reason to combine the references’ teachings in the proposed manner.”). Without such a showing, Petitioner has failed to meet its burden on obviousness.

The Petition also asserts that:

POSITAs also would have understood the benefits of providing Richardson’s auxiliary transponder sensor module with an offset to impulse radio modules discussed above, including better location measurements and improved collision avoidance due to more precise information relating to length of the vehicle and mounting location of each sensor.

Paper 5 at 23. The Petition cites to portions of Mr. Andrews’ Declaration to support this assertion. However Mr. Andrews’ Declaration “merely repeats, verbatim, the conclusory assertion for which it is offered to support.” *Xerox*, IPR2022-00624 at Paper 9, p. 15. Again, it “is entitled little or no weight.” *Id.* (citing 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”))).

Separately, the Petition fails to explain whether a POSITA would have a

reasonable expectation of success at arriving at the claimed invention by combining Grisham's train-to-train-communication embodiment with Richardson's system. Once again, nowhere does Petitioner describe how and whether Richardson's system – designed for use in semi-autonomous construction and agricultural vehicles – would be appropriate for use in trains as described in Grisham. And, because the distances of the Richardson system are limited to between 2 and 40 meters, a POSITA would not have a reasonable expectation of success in combining it with Grisham where the length of one train alone far exceeds 40 meters.

For each of these reasons, Petitioner has failed to demonstrate that claims 5 and 6 are unpatentable over Grisham and Richardson.

D. Ground 1D: Obviousness of Claims 12 and 13 over Grisham in Combination with Breed '945

Claim 12 depends from claim 1 and claim 13 depends from claim 12. These claims are at least not unpatentable for the same reasons that claim 1 is not unpatentable. Further, claims 12 and 13 are not unpatentable because Breed '945 does not disclose “the inertial measurement unit being **operable to detect changes in the speed of the first rail vehicle**[,]” as recited by claim 12. The Petition cites to Breed '945 and its expert, Mr. Andrews, to support its argument that “Breed '945 teaches the use of an inertial measurement unit” detecting “changes in speed[.]” Paper 5 at 27 (citing Breed '945 at [0093], [0205], [567] and [225] and EX1003 at ¶¶153-156). However, none of the cited portions teach or suggest that Breed '945's

IMU is “**operable to detect changes in the speed**[.]” Conspicuously missing from the declaration of Mr. Andrews is any suggestion that Breed ’945’s IMU is “operable to **detect changes in the speed**.” The Petition’s unsubstantiated argument that Breed ’945 discloses this limitation is not evidence. *Enzo Biochem*, 424 F.3d at 1284 (“Attorney argument is no substitute for evidence.”). Because neither Grisham nor Breed ’945 discloses “the first inertial measurement unit being **operable to detect changes in the speed of the first rail vehicle**[.]” as recited by claim 12, claims 12 and 13 are not unpatentable.

Further, regarding the motivation to combine Grisham and Breed ’945, the Petition contends that “POSITAs looking at Grisham would have been motivated to look at speed and acceleration detection systems, such as that of Breed ’945, to supplement Grisham’s UWB-based system to ensure position data and calculations regarding the potential for collision are as exact as possible.” Paper 5 at 28 (citing EX1003 at ¶¶157-158). “Petitioner’s only evidence in support of its assertion . . . is the opinion of its Declarant[.]” Mr. Andrews. *Xerox Corp.*, IPR2022-00624 at Paper 9, p. 15. A review of the cited portions of the Declaration set forth below reveals that Mr. Andrews’ opinions are unsupported conclusory assertions:

157. It is my opinion that a POSITA would have been motivated to combine the Inertial Measurement Unit in communication with a processor in the controller of Breed ’945 with Grisham improve the efficient operations of positioning. A POSITA looking at Grisham

would have understood that measuring range rate (changes in range over a finite time interval) in order to determine speed is only able to measure *relative* speed between the object with the transponder and any other object being measured. This POSITA would have also understood that measuring absolute speed of an object requires knowing the speed of the transponder so that the speed of the sensed object can be derived from the relative speed obtained using range rate measurements. Thus, it would have been obvious to a POSITA to include some independent measure of vehicle speed so that the speed of the other sensed vehicle could be reliably determined. Doing so would have been obvious to try and would have been well within the capability of a POSITA, since, by the priority date of the '227 patent, trains were well-known to include speed measurement devices.

158. As a result, a POSITA would have been motivated to look at other speed and acceleration detection systems to supplement Grisham's UWB-based system to ensure position data is as exact as possible. For example, a POSITA would have understood that tracking changes in speed or acceleration is important for knowing a train's location and avoiding collisions, and also for determining appropriate evasive actions to avoid the obstacle. Also, Breed '945's acceleration data would "substantially improve the crash sensing algorithms" that Grisham uses to determine whether to trigger an alarm by allowing the system to determine the location, speed, and path of the host train to more reliably detect when a collision was likely.

EX1003 at ¶¶157-158. These opinions of Mr. Andrews are devoid of any supporting

documentary evidence. Specifically, Mr. Andrews does not cite to any supporting evidence for the facts that a POSITA “would [allegedly] have understood.” Mr. Andrews’ does not explain how combining “Breed ’945 with Grisham [would] improve the efficient operations of positioning” described in Grisham. EX1003 at ¶157. Nor does Mr. Andrews explain how or why “Breed ’945’s acceleration data would ‘substantially improve the crash sensing algorithms’ that Grisham uses[.]” EX1003 at ¶158. Further, although Mr. Andrews recognizes there were a variety of speed measurement devices, Mr. Andrews does not explain why a POSITA would have included in Grisham’s device, the IMU described in Breed ’945. Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). For this additional reason, claims 12 and 13 are not unpatentable.

The Petition also asserts that:

POSITAs would have been motivated to modify Grisham in view of Breed ’945 to couple Breed ’945’s (first) inertial measurement unit, with its accelerometers and gyroscopes that provide accurate speed and acceleration data beyond the working range of UWB and to provide heading information useful to train-safety systems, to Grisham’s (first) locomotive 1102 to communicate speed changes of locomotive 1102 to the controller within its first control electronics module.

Paper 5 at 28 (citing EX1003 at ¶159). However, neither the Petition nor Mr. Andrews (EX1003 at ¶159) cites to any evidence to support the contention that “Breed ’945’s (first) inertial measurement unit. . . provide[s] accurate speed and acceleration data beyond the working range of UWB” used by Grisham, *i.e.*, except for Mr. Andrews say-so there is no cited evidence that Breed ’945’s (first) inertial measurement unit would improve or enhance the working range of Grisham’s UWB unit. “Untethered to any supporting evidence, much less any contemporaneous evidence, [Mr. Andrews’] *ipse dixit* declaration fail[s] to provide any meaningful explanation for why one of ordinary skill in the art would be motivated to combine these references at the time of this invention.” *TQ Delta*, 942 F.3d at 1362 (citing *InTouch Techs.*, 751 F.3d at 1353-54). Mr. Andrews’ “[c]onclusory expert testimony does not qualify as substantial evidence.” *TQ Delta*, 942 F.3d at 1358. Mr. Andrews’ “conclusory statements and unspecific expert testimony” will be inadequate to support the Board’s fact-finding regarding motivation to modify Grisham. *See id.* at 1362.

There is no reasonable likelihood that the Petitioner would prevail regarding claim 12 and 13.

E. Ground 1F: Obviousness of Claim 15 over Grisham in Combination with Connell

Claim 15 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable. Further, neither Grisham nor Connell

discloses that “the first vehicle mounted module is operable to execute a stopping distance calibration feature that measures a stopping distance under existing conditions,” as recited by claim 15. The Petition does not assert that Grisham discloses “a stopping distance calibration feature.” Regarding Connell, the Petition asserts that:

Connell explains that “the distance required for the train TR to completely stop” is calibrated by dynamically determining brake shoe effectiveness as the train travels. EX1012, [0025]-[0026]. POSITAs would have understood this to mean the distance between a first location when the brakes are engaged and a second location when the first train comes to a complete stop.

Paper 5 at 29-30 (citing EX1003 at ¶¶162-165). Petitioner’s declarant, Mr. Andrews, however, provides no reasoned support for the statement in the Petition that Connell discloses that “‘the distance required for the train TR to completely stop’ is calibrated by dynamically determining brake shoe effectiveness as the train travels.” Paper 5 at 29. Instead, Mr. Andrews concludes that “a POSITA would have easily determined or calibrated the appropriate stopping distance by physically testing the rail vehicles under a variety of conditions, and then adopting the appropriate stopping distance calibration under the existing conditions.” EX1003 at ¶165. Mr. Andrews “does not cite to any additional supporting evidence or provide any technical reasoning to support his statement” (*Xerox*, IPR2022-00624, at Paper 9, p.

15) that, “a POSITA would have easily determined or calibrated the appropriate stopping distance by physically testing the rail vehicles under a variety of conditions, and then adopting the appropriate stopping distance calibration under the existing conditions.” “Thus, the cited declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.” *Id.* (citing 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”)).

Further, Mr. Andrews’ unsupported conclusory statements are “particularly problematic in cases where, like here, expert testimony is offered . . . to supply a limitation missing from the prior art.” *Id.* at 16. “Although doing so might be permissible when ‘the limitation in question [is] unusually simple and the technology particularly straightforward’, Petitioner has not alleged that to be the case here, much less provided support for such an allegation.” *Id.* (citing *Arendi*, 832 F.3d at 1361–62).

F. Ground 2A: Obviousness of Claims 7-9, 17-19, 21, and 24-26 over Grisham and Nixon

Claims 7 and 9 depend from claim 1 and are not unpatentable at least for the same reasons that claim 1 is not unpatentable. Claim 8 depends from claim 7 which depends from claim 1. Claim 8 is not unpatentable at least for the same reasons that claim 1 is not unpatentable. For the independent reasons set forth below, there is no

reasonable likelihood that claim 7 is unpatentable.

Regarding claim 7, Petitioner asserts that “POSITAs would have been motivated to supplement the range of Grisham’s UWB-based collision-avoidance system including by looking to complementary technologies, such as the GPS units of Nixon.” Paper 5 at 32. Citing only to Mr. Andrews’ Declaration, Petitioner states that “POSITAs would have known that UWB has outstanding accuracy but is relatively range-limited due to low transmission power” and that a POSITA would have understood that “trains can be over a mile long and take over a mile of distance to come to a complete stop, meaning that positioning within the distance limitations of UWB lessens the usefulness of UWB in some potential collision situations necessitating stopping a train that is very long or going very fast.” *Id.* Mr. Andrews’ Declaration merely parrots what is said in the Petition. *See* EX1003 at ¶173. Mr. Andrews’ Declaration contains no citations to support his conclusory assertions regarding what a POSITA would have allegedly understood. He does not explain over what distances Grisham’s UWB-based collision-avoidance system would allegedly be ineffective. Mr. Andrews goes on for another page and half describing all the things a POSITA would have purportedly “understood” with no support from the prior art references themselves much less from any other reference establishing

the knowledge of a POSITA at the time of the invention.¹

Mr. Andrew's opinions are "conclusory and unsupported" they "add[] little to the conclusory assertion for which [they are] offered to support, and [are] entitled to little weight." *Xerox*, IPR2022-00624, at Paper 9, p. 15 (citing 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.")). Neither the Petition nor Mr. Andrews explains whether a POSITA would have reasonably expected success in combining Grisham with Nixon to arrive at the claimed invention. Rather, Mr. Andrews states only that "[b]oth UWB and GPS provide positioning data, so it would have been readily apparent to a POSITA how to implement GPS into the radio units from Grisham." EX1003 at ¶176. But that is not enough to establish a reasonable expectation of success. Rather, Petitioner had to show not only that a POSITA *could* have made the alleged combination, but that a POSITA *would* have made the alleged combination. *Auris Health*, 32 F.4th at 1158 ("The motivation-to-

¹ Mr. Andrews cites briefly to a reference he refers to as "Arthur." See EX1003 at ¶175. But that reference does not provide support for Mr. Andrew's conclusory assertions regarding the alleged shortcomings of Grisham's UWB-based collision-avoidance system or the purported motivation to combine the teachings of Grisham with Nixon's GPS.

combine inquiry asks whether a skilled artisan ‘not only could have made but would have been motivated to make the combinations.’”); *3Shape*, IPR2019-00152 at Paper 43,p. 26 (“The law ... require[s] Petitioner to show not only that a [POSITA] could have combined the references in the proposed manner, but that a [POSITA] would have had a reason to combine the references’ teachings in the proposed manner.”). Petitioner has failed to meet that burden and has, therefore, failed to demonstrate that claims 7, 8, and 9 are obvious over Grisham combined with Nixon.

Claim 17 is an independent claim that is similar to independent claim 1. The main difference between claim 17 and claim 1 is that claim 17 also requires that the rail vehicle module include “a global positioning system unit operable to receive information from one or more satellites to determine an absolute position of the first rail vehicle.” For many of the same reasons described *supra* in § V.A describing why Grisham does not disclose the claim elements described in claim 1, Grisham likewise does not disclose the claim elements described in claim 17. For the additional requirement related to GPS, as explained above regarding claims 7, 8, and 9, Petitioner has (1) failed to identify a motivation to combine Grisham with Nixon and (2) failed to explain whether a POSITA would have reasonably expected success in making the combination and arriving at the claimed invention. The combination of Grisham and Nixon does not render obvious claim 17.

Claim 18 depends from claim 17 and is not unpatentable at least for the same

reasons that claim 17 is not unpatentable.

Claim 19 depends from claim 17 and is not unpatentable at least for the same reasons that claim 17 is not unpatentable.

Claim 21 depends from claim 17 and is not unpatentable at least for the same reasons that claim 17 is not unpatentable. In addition, claim 21 tracks the limitations described in claims 8 and 9 and is not unpatentable for the same reasons described *supra* in this Section regarding claims 8 and 9.

Claim 24 is an independent claim that is similar to independent claim 1. *See* Paper 5 at 37 (explaining that limitations [24-Pre] through [24-C] track to [1-Pre], [1A], [1B], and [1F]). Those claim limitations are not satisfied by Grisham for the same reasons described *supra* in Ground 1A. In addition, claim limitation [24D] tracks to claim 7 and is not satisfied by Grisham and Nixon for the same reasons described *supra* in Ground 2A. Claim limitations [24E] and [24G] track to claim limitations [1C] and [1F] and are not satisfied by Grisham for the same reasons described *supra* in Ground 1A. Claim limitation [24H] tracks to claim 8 and is not satisfied for the same reasons described *supra* in Ground 2A.

Claim 25 depends from claim 24 and is not unpatentable at least for the same reasons that claim 24 is not unpatentable. In addition, claim 25 tracks the limitations described in claim [1B] and is not unpatentable for the same reasons described *supra* in Ground 1A regarding [1B].

Claim 26 depends from claim 24 and is not unpatentable at least for the same reasons that claim 24 is not unpatentable. In addition, claim 26 tracks the limitations described in claim 9 and is not unpatentable for the same reasons described *supra* in Ground 2A regarding claim 9.

G. Ground 2B: Obviousness of Claim 20 over Grisham, Nixon, and Richardson

Claim 20 depends from claim 17 and is not unpatentable at least for the same reasons that claim 17 is not unpatentable.

Claim 20 contains limitations that track the limitations of claims 5 and 6 and its limitations are not met for the same reasons explained above for claims 5 and 6 in response to Petitioner's Ground 1C.

As discussed above in response to Petitioner's Ground 2A, Petitioner has not met its burden in identifying a motivation to combine Grisham's UWB-based collision-avoidance system with the features of the collision-avoidance system of Nixon. *See* §V.F, *supra*. Further, Petitioner has not demonstrated that a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed combination. Likewise, as discussed above in response to Petitioner's Ground 1C, Petitioner has not met its burden in identifying a motivation to combine Grisham with Richardson and has not demonstrated that a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed invention. *See* §V.C, *supra*. For at least these

reasons, Petitioner's obviousness analysis based on the combinations of Grisham, Richardson, and Nixon also fails.

H. Ground 2C: Obviousness of Claims 22, 27, and 28 over Grisham, Nixon, and Douglas

Claim 22 depends from claim 17 and is not unpatentable at least for the same reasons that claim 17 is not unpatentable. The Petition asserts that “[t]he limitations of Claim 22 track to Claims 2 and 3 and are satisfied by Grisham and Douglas for the same reasons as explained above for claims 2-3 in Ground 1B.” Paper 5 at 40. In view of this, claim 22 is also not unpatentable for the same reasons that claim 2 and 3 are not unpatentable. *See* § V.B, *supra*.

Claim 27 depends from claim 24 and is not unpatentable at least for the same reasons that claim 24 is not unpatentable. The Petition asserts that “[t]he limitations of Claim 27 track to Claim 2 and are satisfied by Grisham and Douglas for the same reasons provided for claim 2 in Ground 1B.” Paper 5 at 40. In view of this, claim 27 is also not unpatentable for the same reasons that claim 2 is not unpatentable. *See* §V.B, *supra*.

Claim 28 depends from claim 24 and is not unpatentable at least for the same reasons that claim 24 is not unpatentable. The Petition asserts that “[t]he limitations of Claim 28 track to Claim 3 and are satisfied by Grisham and Douglas for the same reasons provided for claim 3 in Ground 1B.” Paper 5 at 40. In view of this, claim 28 is also not unpatentable for the same reasons that claim 3 is not unpatentable. *See*

§V.B, *supra*.

I. Ground 2D: Obviousness of Claim 10 over Grisham, Nixon, and McDaniel

Claim 10 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable.

Claim 10 recites, in relevant part, “wherein the first vehicle mounted module executes an adaptive threshold feature that modifies one or more vehicle separation thresholds based on the speed of the first rail vehicle and the speed of the second rail vehicle.” As a basis for the alleged motivation to combine Grisham and McDaniel, Petitioner asserts that “[a] POSITA. . . would have been motivated to incorporate McDaniel’s adaptive threshold warning system for vehicle collision avoidance into the collision-avoidance system [of Grisham] in order to accurately and effectively avoid collisions when rail vehicles are approaching at different speeds and to avoid nuisance alerts to the operator of the safe approach or close proximity of other trains” because the system of Grisham allegedly is “intended to avoid collisions of any rail vehicle, regardless of speed” and “a POSITA would have understood that a collision-avoidance system would need a way of alerting an operator only to potential collision situations, not merely situations where a train is nearby, given the number of trains that can safely be positioned within feet of each other in, for example, a train yard.” Paper 5 at 42.

Petitioner, however, fails to explain how the “adaptive threshold feature” of

McDaniel would purportedly work in the collision-avoidance system of Grisham, specifically, whether the “adaptive threshold feature” would be able to selectively disregard situations where a train is merely nearby, but not at risk of collision, as Petitioner suggests. McDaniel describes an “adaptive threshold feature” that is “directed toward a method for determining a threshold distance for a collision warning system.” EX1015 at ¶0008. This threshold distance is a “function of the velocity of the target object, the velocity of the host machine, an angle of inclination of each of the host machine and the target object, and a reaction time associated with an environmental condition.” *Id.* Nowhere does McDaniel discuss deciphering between target objects that are a true threat and those that are merely a nuisance – *i.e.*, in the context of trains, that would be trains nearby but on a separate and distinct track. As such, Petitioner’s assertion that “[a] POSITA. . . would have been motivated to incorporate McDaniel’s adaptive threshold warning system. . . to avoid nuisance alerts to the operator of the safe approach or close proximity of other trains” is unsupported.

In addition, Petitioner fails to explain whether a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed invention. Instead Petitioner summarily states that such implementation “would have been a routine and simple change by a POSITA” because “Grisham already collects speed and distance data.” Paper 5 at 42. But that Grisham “already

collects speed and distance data” does not explain whether a POSITA would have had a reasonable expectation of success in combining McDaniel’s “adaptive threshold feature” with Grisham especially considering that McDaniel’s “adaptive threshold feature” was not specifically designed for use in trains. Rather, McDaniel’s system was designed for use in a “machine” which it describes as “any type of fixed or mobile machine configured to perform a task associated with an industry such as farming, transportation, construction, mining, energy exploration, power generation, etc.” and provides examples of “fixed machines” such as “an engine system, a drill rig, etc. that operates in a plant or off-shore environment” and provides examples of “mobile machines” such as “on-highway or off-highway vehicles, trucks, cranes, earth moving machines, backhoes, track-type tractors, motor graders, haulers, dump trucks, excavators, aircraft, marine vessels, farming equipment, or any type of movable machine that operates in a work environment.” EX1015 at ¶16. It is not evident from McDaniels itself that the “machines” recited therein contemplate use in a train system and Petitioner has provided no explanation for why or how that it is applicable to trains.

For each of these reasons, Petitioner has failed to demonstrate that claim 10 is unpatentable over Grisham, Nixon, and McDaniels.

J. Ground 2E: Obviousness of Claim 16 over Grisham, Nixon, McDaniel, and Connell

Claim 16 depends from claim 15 which depends from claim 1 and is not

unpatentable at least for the same reasons that claim 1 is not unpatentable.

The Petition asserts that “Claim 16 contains limitations that track the limitations of claims 9 and 10, and its limitations are satisfied for the same reasons as explained above for claim 9 in Ground 2A and claim 10 in Ground 2D.” Paper 5 at 43. In view of this, claim 16 is also not unpatentable for the same reasons that claims 9 and 10 are not unpatentable. *See supra* at Sections V.F and V.I.

Petitioner has provided no substantive reasoning to justify why a POSITA would have been motivated to combine all four of these references together.

K. Ground 2F: Obviousness of Claim 23 over Grisham, Nixon, McDaniel, Connell, and Breed ‘945

Claim 23 depends from claim 16 which depends from claim 15 which depends from claim 1 and is not unpatentable for the same reasons described for claim 1.

The Petition asserts that “[t]he limitations of Claim 23 track to Claim 12 and are satisfied by Breed ‘945 for the same reasons provided for claim 12 in Ground 1D.” Paper 5 at 43. In view of this, claim 23 is also not unpatentable for the same reasons that claim 12 is not unpatentable. *See supra* at Section V.D.

Petitioner has provided no substantive reasoning to justify why a POSITA would have been motivated to combine all five of these references together.

L. Ground 3A: Obviousness of Claims 1, 7-8, 11-14, 17-19, 24, and 25 over Suzuki Alone or in Combination with Grisham

1. A POSITA would not be motivated to use Suzuki on rail vehicles

Claim 1 recites “one or more vehicle mounted modules, each vehicle mounted module mountable on a rail vehicle.” Claim 17 recites “[a] rail vehicle module mountable on a rail vehicle.” Claim 24 recites “[a] collision avoidance system comprising.” The Petition admits that Suzuki describes its embodiments for use in “motor vehicles (“cars”) rather than rail-line vehicles.” Nevertheless, according to the Petition, “POSITAs would have understood Suzuki’s teachings to be applicable more broadly to all ground vehicles, including rail-line vehicles, because Suzuki generally refers to ‘vehicles’ throughout its disclosure, only sometimes further specifying that those vehicles are ‘cars.’” Paper 5 at 46.

Suzuki describes a device that implements “a communication function and radar function” (EX1005 at [0008]) and that “combin[es] the measurement of distance to other vehicle around the own vehicle *within a short distance* and the vehicle-to-vehicle communication.” EX1005 at [0007]. “[W]ith the use of the communication function, by informing its own position to each other between vehicles equipped with the communication function by means of the UWB, *the distance to a surrounding vehicle close to its own vehicle is measured.*” *Id.* Thus, the device disclosed in Suzuki measures separation distances between vehicles that are close to each other. As the 227 Patent recognizes, to avoid crashes between rail vehicles, the devices must be capable of measuring separation distances where the rail vehicles are far apart. *See* EX1001 at 23:32-35 (“For example, a separation

distance of 40 feet may be acceptable when vehicles are traveling at 5 miles per hour, but if the vehicles are traveling at 20 miles per hour, an unsafe condition may exist (sic).”). A POSITA would recognize that the device disclosed in Suzuki would not be capable of measuring the separation distance. A POSITA would not be motivated to employ Suzuki’s device on rail vehicles and have a reasonable expectation of success of arriving at the claimed “collision avoidance system” for rail vehicles.

The Petition contends that “if the Board does not find that Suzuki alone teaches or suggests vehicle-mounted modules mounted on rail vehicles, POSITAs would have been motivated to apply Suzuki’s collision-avoidance system to rail vehicles and mount Suzuki’s vehicle-mounted modules and other components on rail vehicles, in view of Grisham, and would have a reasonable expectation of success.” Paper 5 at 50. To support this contention, the Petition cites to its expert, Mr. Andrews’ Declaration (EX1003). However, Mr. Andrews’ Declaration repeats verbatim the statements in the Petition. *Compare* Paper 5 at 49-50 *with* EX1003 at ¶¶239-240. Worse yet, Mr. Andrews’ statements regarding motivation are not supported by any evidence. *See* EX1003 at ¶¶239-242. For example, Mr. Andrews’ concludes, without citing to any evidence, that “a POSITA reading Grisham would have understood that rail systems and car systems would provide the greatest benefit when they are compatible with each other.” EX1003 at ¶242. “Untethered to any supporting evidence, much less any contemporaneous evidence, [Mr. Andrews’]

ipse dixit declaration fail[s] to provide any meaningful explanation for why one of ordinary skill in the art would be motivated to combine these references at the time of this invention.” *TQ Delta*, 942 F.3d at 1362 (citing *InTouch Techs.*, 751 F.3d at 1353-54). Mr. Andrews’ “[c]onclusory expert testimony does not qualify as substantial evidence.” *TQ Delta*, 942 F.3d at 1358. And even if compatibility between cars and trains were a consideration, there are several differences between car and train collision avoidance systems, as Mr. Andrews himself recognizes. *See* EX1003 at ¶242 (“rail vehicles have fewer degrees of freedom of movement than cars as rail vehicles are constrained to travel on defined railways and cars are not[.]”) Mr. Andrews has not explained why a POSITA would be motivated to replace Grisham’s train-based system with Suzuki’s car-based system. In sum, Mr. Andrews’ “conclusory statements and unspecific expert testimony” will be inadequate to support the Board’s fact-finding regarding motivation to modify Suzuki or the combination of Suzuki and Grisham. *See id.* at 1362.

2. Suzuki alone or in combination with Grisham does not disclose or suggest “user interface being operable to provide rail vehicle information to a vehicle operator and to receive input from the vehicle operator”

The Petition concedes that Suzuki “does not explicitly state an ability to receive input from the vehicle operator[.]” Paper 5 at 54. To remedy this deficiency, the Petition contends that “it would be obvious that the warning and alarm displays and the automotive navigation system disclosed in Suzuki (which a POSITA would

have understood conventionally appear on a vehicle display) would preferably receive input from a driver, such as muting the alarm or adjusting the volume.” *Id.* at 55 (citing EX1003 at ¶251). To support this contention, the Petition relies on its expert, Mr. Andrews who “merely repeats, verbatim, the conclusory assertion for which it is offered to support.” *Xerox Corp.*, IPR2022-00624, Paper 9 at 16. “This is particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art.” *Id.*

The Petition contends that “[w]hile Suzuki alone renders this element obvious, in the alternative, Suzuki in view of Grisham also does so.” Paper 5 at 55. However, Grisham does not expressly disclose this element. Instead the Petition contends that “Grisham teaches a user interface module including a display that provides information to and can receive input from the vehicle operator, such as by allowing the vehicle operator to communicate with other vehicle operators through Grisham’s display.” Paper 5 at 55-56. However, Petitioner provides no evidence for this contention. The Petition’s conclusory assertion cannot render this claim element obvious. *See also V.A.2, supra.*

There is no reasonable likelihood that Suzuki alone or Suzuki in combination with Grisham renders claims 1, 17, and 24 unpatentable. At least for the same reasons, there is no reasonable likelihood that Suzuki alone or Suzuki in combination

with Grisham render claims 7-8, 11-14, 18-19, and 25 unpatentable.

M. Ground 3B: Obviousness of Claims 2-6, 20, 22, and 27-28 over Suzuki and Richardson (or Suzuki, Grisham, and Richardson)

Claims 2, 3, 4, 5, and 6 depend from claim 1 and are not unpatentable at least for the same reasons that claim 1 is not unpatentable with respect to Suzuki alone or in combination with Grisham.

Claims 20 and 22 depend from claim 17 and are not unpatentable at least for the same reasons that claim 17 is not unpatentable with respect to Suzuki alone or in combination with Grisham.

Claims 27 and 28 depend from claim 24 and are not unpatentable at least for the same reasons that claim 24 is not unpatentable with respect to Suzuki alone or in combination with Grisham.

As discussed above regarding Petitioner's Ground 3A and Ground 1C, neither Suzuki nor Richardson relate to collision-avoidance systems for rail vehicles. *See* §§V.C and V.L, *supra*. A POSITA would not be motivated to combine Suzuki's device with Richardson's device for use on rail vehicles. A POSITA would not have a reasonable expectation of success of arriving at the claimed "collision avoidance system" for rail vehicles.

Referring to claim 2, the Petition asserts that:

[A] POSITA would have been motivated to combine the teachings of Suzuki and Richardson, or, in the alternative, Suzuki, Richardson and

Grisham, because they are all directed to systems using vehicle-proximity detection to improve safety and prevent vehicle collisions and because Suzuki's disclosure of UWB communication and control over a "platoon" of vehicles is analogous to Richardson's disclosure of UWB communication and control over a "convoy" of vehicles. EX1003, ¶¶321. POSITAs would have looked to known technologies, such as Richardson's use of UWB controllers acting as (distributed) CTUs, to improve the collision avoidance systems of Suzuki and Grisham, which would yield a reasonable expectation of success. *Id.* POSITAs also would have understood that users of Suzuki's or Grisham's collision avoidance system would benefit from using (distributed) CTUs as taught by Richardson, including reducing potential collisions by monitoring in a unified manner the locations of and distances between multiple vehicles. *Id.*

Paper 5 at 69-70. Neither the Petition nor the Andrews' Declaration explains why a POSITA would look to "improve the collision avoidance systems of Suzuki and Grisham." Also, neither the Petition nor the Andrews' Declaration explains why "POSITAs also would have understood that users of Suzuki's or Grisham's collision avoidance system would benefit from using (distributed) CTUs as taught by Richardson." These "conclusory statements and unspecific expert testimony" will thus be inadequate to support the Board's fact-finding regarding motivation to combine Grisham. *See TQ Delta*, 942 F.3d at 1362.

There is no reasonable likelihood that the Petitioner would prevail claims 2-

6, 20, 22, and 27-28.

N. Ground 3C: Obviousness of Claims 9, 21, and 26 over Suzuki and Nixon (or Suzuki, Grisham, and Nixon)

Claim 9 depends from claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable with respect to Suzuki alone or in combination with Grisham as described in response to Petitioner's Ground 3A.

Claim 21 depends from claim 17 and is not unpatentable at least for the same reasons that claim 17 is not unpatentable with respect to Suzuki alone or in combination with Grisham as described in response to Petitioner's Ground 3A.

Claim 26 depends from claim 24 and is not unpatentable at least for the same reasons that claim 24 is not unpatentable with respect to Suzuki alone or in combination with Grisham as described in response to Petitioner's Ground 3A.

As discussed above regarding Petitioner's Ground 2A, Petitioner has failed to provide a motivation to combine Nixon with Grisham and has failed to explain whether a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed invention. *See* §V.F, *supra*. Likewise, Petitioner has failed to provide both a motivation to combine and reasonable expectation of success analysis for the combination of Nixon, Suzuki, and Grisham. As it did for Ground 2A, Petitioner provides citations only to Mr. Andrew's declaration which is full of conclusory statements unsupported by any citation to the references themselves. For at least this reason, Petitioner has not

demonstrated that claims 9, 21, and/or 26 are obvious over Nixon and Suzuki or in view of Nixon, Suzuki, and Grisham.

O. Ground 3D: Obviousness of Claim 15 over Suzuki and Connell (or Suzuki, Grisham, and Connell)

Claim 15 depends on claim 1 and is not unpatentable at least for the same reasons that claim 1 is not unpatentable with respect to Suzuki alone or in combination with Grisham as described in response to Petitioner's Ground 3A.

As discussed above regarding Petitioner's Ground 1F, Petitioner has failed to provide a motivation to combine Connell with Grisham and has failed to explain whether a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed invention. *See* §V.E, *supra*. Likewise, Petitioner has failed to provide both a motivation to combine and reasonable expectation of success analysis for the combination of Connell, Suzuki, and Grisham. As it did for Ground 1F, Petitioner provides citations only to Mr. Andrew's Declaration which is full of conclusory statements unsupported by any citation to the references themselves. For at least this reason, Petitioner has not demonstrated that claim 15 is obvious over Connell and Suzuki or in view of Connell, Suzuki, and Grisham.

P. Ground 3E: Obviousness of Claim 10 over Suzuki, Nixon, and McDaniel (or Suzuki, Grisham, Nixon, and McDaniel)

Claim 10 depends on claim 1 and is not unpatentable at least for the same

reasons that claim 1 is not unpatentable with respect to Suzuki alone or in combination with Grisham as described in response to Petitioner's Ground 3A.

As discussed above regarding Petitioner's Ground 3C (and 2A), Petitioner has failed to provide a motivation to combine Suzuki, Nixon and Grisham and has failed to explain whether a POSITA would have had a reasonable expectation of success in making the alleged combination to arrive at the claimed invention. *See* §V.N, *supra*. Likewise, Petitioner has failed to provide both a motivation to combine and reasonable expectation of success analysis for the combination of Suzuki, Nixon, Grisham, and McDaniel. As it did for Ground 3C, Petitioner provides citations only to Mr. Andrew's Declaration which is full of conclusory statements unsupported by any citation to the references themselves. For at least this reason, Petitioner has not demonstrated that claim 10 is obvious over Suzuki, Nixon, and McDaniel or in view of Suzuki, Nixon, McDaniel, and Grisham.

Q. Ground 3F: Obviousness of Claims 16 and 23 over Suzuki, Nixon, McDaniel, and Connell, or Suzuki, Nixon, McDaniel, Connell, and Grisham

Claim 16 depends from claim 15 which depends from claim 1 and is at least not unpatentable at least for the same reasons that claim 1 is not unpatentable. Claim 23 depends from claim 16 which depends from claim 15 which depends from claim 1 and is at least not unpatentable for the same reasons that claim 1 is not unpatentable. Further, the Petition has failed to establish that a POSITA would be

motivated to combine Suzuki, Nixon, McDaniel, and Connell or Suzuki, Grisham, Nixon, McDaniel, and Connell.

VI. CONCLUSION

For at least the foregoing reasons, Patent Owner respectfully requests that the Board refuse to institute an *inter partes* review.

Dated: April 26, 2023

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CERTIFICATE OF SERVICE

I certify that the Patent Owner Preliminary Response to Petition for *Inter Partes* Review under 35 U.S.C. § 42.107 in connection with *Inter Partes* Review Case IPR2023-00470 was served on April 26, 2023 by electronic mail to:

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CERTIFICATE OF WORD COUNT

Under 37 C.F.R. § 42.24(d), the undersigned attorney for the Patent Owner, Metrom Rail, LLC, declares this Patent Owner Preliminary Response has 11,380 words, according to Microsoft Word® word count tool, excluding the parts of the Response exempted by 37 C.F.R. § 42.24(a)(1).

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