IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION (d/b/a WABTEC CORPORATION), Plaintiff, v. SIEMENS INDUSTRY, INC., Defendant.	C.A. No. 2:17-cv-01184-NBF **JURY TRIAL DEMANDED**

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Westinghouse Air Brake Technologies Corporation (d/b/a Wabtec Corporation) ("Wabtec"), files this first amended complaint for patent infringement against Siemens Industry, Inc. ("Siemens"), and in support thereof alleges and avers as follows:

NATURE OF THE ACTION

1. This is a civil action arising under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq.*, specifically including 35 U.S.C. § 271, based on Siemens' infringement of U.S. Patent Nos. 7,398,140 (Exhibit A), 8,175,764 (Exhibit B), and 8,478,463 (Exhibit C).

THE PARTIES, JURISDICTION AND VENUE

2. Wabtec is a corporation organized under the laws of the State of Delaware, with a principal place of business at 1001 Air Brake Avenue in Wilmerding, Pennsylvania.

3. Siemens is a corporation organized under the laws of the State of Delaware, with a principal place of business at 3333 Old Milton Parkway in Alpharetta, Georgia.

4. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a) because the claims arise under the patent laws of the United States, 35 U.S.C. § 1 *et seq*., including 35 U.S.C. § 271.

5. This Court has personal jurisdiction over Siemens because Siemens has continuous and systematic contacts with the Commonwealth of Pennsylvania, through at least its manufacturing facility in Munhall, PA, and thereby has purposefully availed itself of the benefits and protections of the laws of the Commonwealth of Pennsylvania.

6. This Court also has personal jurisdiction over Siemens because, as described in more detail below, Siemens has committed and continues to commit acts of patent infringement giving rise to this action in the Commonwealth of Pennsylvania and has harmed and continues to harm Wabtec in the Commonwealth of Pennsylvania by, among other things, making, using, offering for sale, and selling infringing products and systems in the Commonwealth of Pennsylvania, and thereby has established minimum contacts such that the exercise of personal jurisdiction over Siemens does not offend traditional notions of fair play and substantial justice.

7. Venue is proper in this district under 28 U.S.C. § 1400(b) because Siemens, through its manufacturing facility in Munhall, has a regular and established place of business in the Western District of Pennsylvania and, as further described below, has committed acts of infringement in this district by making, using, offering for sale, and selling infringing products.

8. Specifically, the accused infringing product includes Siemens' Trainguard PTC System ("Trainguard PTC"). On information and belief, Siemens manufactures, tests, develops, offers for sale, and sells Trainguard PTC and components thereof at its Munhall, Pennsylvania facility.

9. The Rail Automation arm of Siemens' U.S. operations "manufactures and engineers all of [Siemens'] Cab Signaling and Positive Train Control equipment" in Munhall, Pennsylvania. (Ex. D, Manufacturing in the U.S., Siemens, https://w3.usa.siemens.com/mobility/us/en/pages/factory-locations.aspx (downloaded August 31, 2017) ("Siemens' Factory Locations") at 1).

10. In 2014, Siemens expanded its manufacturing operations in the Pittsburgh area by adding 129 jobs in engineering and manufacturing. (Ex. E, Siemens Rail Automation to expand Pennsylvania manufacturing and engineering operations, create jobs to support Positive Train Control projects, Siemens (August 13, 2014) http://news.usa.siemens.biz/press-release/mobility-and-logistics/siemens-rail-automation-expand-pennsylvania-manufacturing-and-e).

Siemens' Delaware Patent Infringement Suit

11. On April 21, 2016, Siemens filed suit against Wabtec in the District of Delaware, alleging that Wabtec was infringing U.S. Patent Nos. 6,996,461; 7,092,801; 7,236,860; 7,467,032; 7,742,850; 8,714,494; and 9,233,698.

12. In January 2017, Siemens amended its Complaint to assert six additional patents: U.S. Patent Nos. 6,968,195; 7,079,926; 7,200,471; 6,845,953; 7,036,774; and 6,824,110.

13. Wabtec counterclaimed on February 14, 2017, alleging that Siemens was infringing U.S. Patent Nos. 7,398,140, 8,175,764, and 8,478,463 (collectively, the "Wabtec Patents-in-Suit").

14. Siemens moved to sever Wabtec's counterclaims on March 20, 2017, alleging, among other things, that the counterclaims were unrelated to Siemens' original claims, that the counterclaims involved different issues, different products, different witnesses, and different

evidence, and that Siemens would be unduly prejudiced if the competing claims were part of the same case.

15. On August 17, 2017, Magistrate Judge Burke of the District of Delaware granted Siemens' motion to sever, giving Wabtec the ability to re-file its counterclaims in a new case. (*See* Ex. F, *Siemens Indus., Inc. v. Westinghouse Air Brake Technologies Corp. d/b/a/ Wabtec Corp.*, No. DED-1-16-cv-00284 (Aug. 17, 2017) (Oral Order) ("To the extent that Defendants timely ***re-file*** their counterclaims ***in a new case*** . . ." (emphasis added)).

16. This order constitutes dismissal without prejudice of Wabtec's counterclaims of infringement of the Wabtec Patents-in-Suit consistent with past practice in the District of Delaware.

17. For example, in *LG Electronics Inc. v. Toshiba Samsung Storage Technology Korea Corp.*, Case No. DED-1-12-cv-01063, Magistrate Judge Burke used similar language in severing the defendant's counterclaims. *See* D.I. 91 at 12:9–12 ("So I do hereby order that the what are now counterclaims be severed, and should, as I assume is the case, TSST wish to proceed on those, that they do so ***through opening a new case***." (emphasis added)).

18. In the new TSS action, Magistrate Judge Burke referred to the severed counterclaims as having been dismissed without prejudice. *Toshiba Samsung Storage Tech. Korea Corp. v. LG Elecs. Inc.*, DED-1-15-cv-00691, D.I. 31 (D. Del. Dec. 3, 2015) ("[T]hose counterclaims were severed and dismissed without prejudice").

19. Similarly, Wabtec's counterclaims were dismissed without prejudice.

20. Wabtec has re-filed the original Delaware counterclaims as the present Complaint against Siemens in this judicial district. As such the present Complaint is the same litigation

against Siemens that Wabtec brought as counterclaims against Siemens in the District of Delaware.

THE PATENTS-IN-SUIT

21. U.S. Patent No. 7,398,140 ("'140 Patent"), titled "Operator warning system and method for improving locomotive operator vigilance," was issued by the United States Patent and Trademark Office ("USPTO") on July 8, 2008. Wabtec is the lawful owner by assignment of all rights, title and interest in the '140 Patent, including the right to sue for patent infringement and damages, including past damages. A true and correct copy of the '140 Patent is attached hereto as Exhibit A.

22. U.S. Patent No. 8,175,764 ("'764 Patent"), titled "System and method for identifying an upcoming feature in a track network," was issued by the USPTO on May 8, 2012. Wabtec is the lawful owner by assignment of all rights, title and interest in the '764 Patent, including the right to sue for patent infringement and damages, including past damages. A true and correct copy of the '764 Patent is attached hereto as Exhibit B.

23. U.S. Patent No. 8,478,463 ("'463 Patent"), titled "Train control method and system," was issued by the USPTO on July 2, 2013. Wabtec is the lawful owner by assignment of all rights, title and interest in the '463 Patent, including the right to sue for patent infringement and damages, including past damages. A true and correct copy of the '463 Patent is attached hereto as Exhibit C.

BACKGROUND OF THE DISPUTE

The Rail Safety Improvement Act of 2008

24. Since 1985, predecessors of Wabtec have been working on the development of Positive Train Control ("PTC") technology and related rail-systems-integration solutions.

25. In 2008, Congress enacted the Rail Safety Improvement Act ("RSIA") which required all Class I railroads and passenger rail operators to implement a mandatory PTC collision avoidance system by December 31, 2015.

26. According to the Association of American Railroads ("AAR"), "Class I Railroads are line haul freight railroads with 2015 operating revenue of $457.91 million or more." (Ex. G, Class I Railroad Statistics, Association of American Railroads (downloaded from https://www.aar.org/Documents/Railroad-Statistics.pdf) at 1).

27. Four different individual platforms were developed to implement PTC for each of Union Pacific ("UP") Railroad, Norfolk Southern ("NS") Corporation, CSX Transportation ("CSX"), and BNSF Railway ("BNSF").

28. These four railroads—UP, NS, CSX, and BNSF—are referred to collectively and colloquially as the "Big Four."

29. One of the platforms developed to implement PTC, the Electronic Train Management System ("ETMS"), was conceived and manufactured by Wabtec.

30. Because the Class I railroads frequently operate across each other's tracks, it was necessary for the various PTC platforms to be interoperable, but achieving this goal presented a challenge.

31. To tackle interoperability, the Big Four came together under the auspices of the AAR and formed the Interoperable Train Control ("ITC") Working Committee. (*See* Ex. H, William C. Vantuono, PTC: Is Everyone on Board?, *Railway Age* (Apr. 28, 2010), http://www.railwayage.com/index.php/ptc/ptc-is-everyone-on-board.html ("Railway Age Article")).

32. The ITC implemented interoperability by selecting the ETMS platform offered by Wabtec because it met all the RSIA PTC requirements and was already in trials by many of the Class I's and other rail operators.

33. As a result of its acceptance by the ITC, Wabtec's Interoperable Electronic Train Management System ("I-ETMS") solution became the main technical architecture for PTC in North America. (Ex. I, PTC White Paper, May 2012 at 13).

34. For decades, Wabtec has continuously expanded its long-developed and innovative advancements in PTC

35. Wabtec continues to be the most significant and primary vendor in the PTC space. (*Id.*).

Wabtec's I-ETMS Solution

36. Building upon the expertise developed through the design and implementation of advanced train control systems like the Advanced Railway Electronics System ("ARES"), Wabtec contracted with BNSF to begin development of ETMS in the late 1990s.

37. ETMS was an overlay system designed to improve train safety by preventing (1) train-to-train collisions, (2) work zone incursions, and (3) overspeed derailments. (Ex. J, Electronic Train Management System and Safety, March 9, 2007 (downloaded from http://railtec.illinois.edu/CEE/pdf/PPT's/previousppts/ETMS%20and%20Safety.pps%20[Repaired].pdf) at 21).

38. ETMS was specifically designed to provide a platform for future development. (*Id.*).

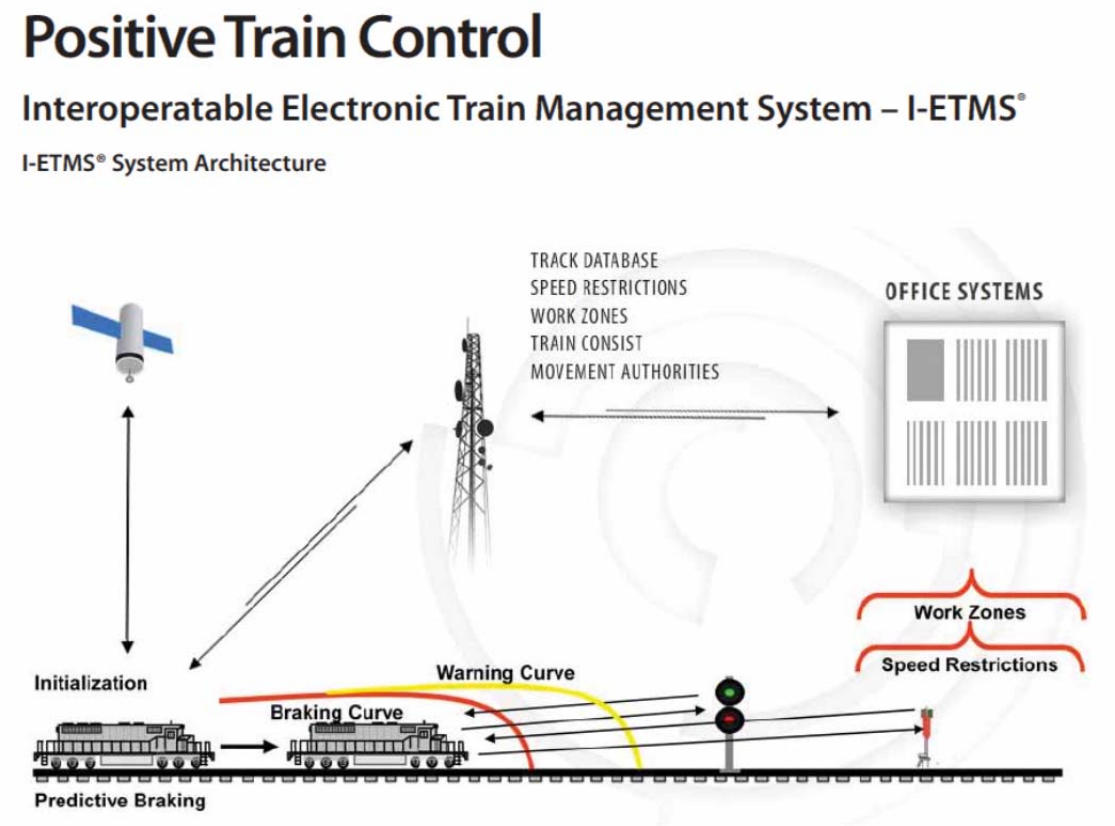
39. Following the passage of the RSIA in 2008, Wabtec expanded and refined ETMS development to create I-ETMS.

40. I-ETMS is an overlay system "used in conjunction with existing methods of operation . . . that interfaces to existing signal systems, wayside devices, and office train dispatching systems (CAD) via multiple communications links." (Ex. K, FRA Type Approval, Federal Railroad Administration (downloaded from https://www.regulations.gov/document?D=FRA-2010-0061-0050), at 2).

41. I-ETMS "is designed to support different railroads and their individual methods of operation." (*Id.*).

42. The I-ETMS design "supports interoperability across railroads as I-ETMS locomotives apply consistent warning and enforcement rules regardless of trackage ownership." (*Id.*).

43. I-ETMS consists of four distinct segments: the Office Segment (Train Data, Authorities, Restrictions); the Wayside Segment (Signal Status, Switch Status, Radio Frequency Communication); the Communication Segment (RF Base Stations, 802.11, Cellular); and the Locomotive Segment (Onboard Computer and Display, GPS, RF Communication). The diagram below illustrates the general architecture of I-ETMS:



(Ex. L, Wabtec Locomotive Catalog (downloaded from https://www.wabtec.com/uploads/WabtecLocomotiveProductCatalog.pdf) at 35).

44. The Office Segment, which includes one or more Back Officer Servers ("BOS"), interfaces with other railroad back office systems or applications, the railroad dispatch system, and the Locomotive and Communications Segments to serve as a conduit for information conveyed to the Locomotive Segment where the system's vitality resides. (Ex. K, FRA Type Approval at 2).

45. "The Wayside Segment monitors and reports switch position, signal indications, or status of other monitored wayside devices directly to the Locomotive Segment and Office Segment using one or more radio networks." (*Id.* at 3).

46. "The Communications Segment consists of a messaging system and multiple wired and wireless networks through which messages are exchanged between the Locomotive, Wayside, and Office Segments." (*Id.*).

47. "The Locomotive Segment accepts movement authorities, temporary speed restrictions, other mandatory directives, train consist data, and other information from the Office Segment." (*Id.* at 5). It also "interfaces with other locomotive devices including an event recorder, train line data sensors, the horn circuit, brake systems, cab signal system (if equipped), and the Communication Segment." (*Id.*).

48. In operation, I-ETMS is designed to "[p]revent[] track authority violations, speed limit violations, unauthorized entry into work zones, and train movement through a switch left in the wrong position, all of which reduce the potential for train accidents." (Ex. M, Wabtec Product Finder, available at https://www.wabtec.com/products) at 4.

49. I-ETMS leaves the train crew in control of the train, and "[m]onitors and ensures the crew's compliance with all operating instructions, while the I-ETMS® display screen provides the train crew with a wealth of operating information." (*Id.*).

50. "As the train moves down the track, the I-ETMS® on-board computer, with the aid of an on-board geographic database and global positioning system, continuously calculates warning and braking curves based on all relevant train and track information, including speed, location, movement authority, speed restrictions, work zones, and consist restrictions." (*Id.*).

51. I-ETMS also "communicates with wayside devices checking for broken rails, proper switch alignment and signal aspects." (*Id.*).

52. "All information is combined and analyzed in real time to provide a 'safety net' for improved train operation." (*Id.*).

53. A critical component of I-ETMS is a Train Management Computer ("TMC"), which is the brain of the system on any given locomotive and which incorporates multiple controllers to implement the functionality of PTC. (Ex. L, Wabtec Locomotive Catalog at 36).

54. The TMC is responsible for enforcing movement authorities, speed limits, and switch alignment. (*Id.*).

55. I-ETMS, through the TMC, will notify the train operator through a visual and/or audio warning if a potentially dangerous situation, such as a broken rail, improperly aligned switch, or other hazard is encountered. (*Id.*).

56. If the operator does not control the train properly in response to the hazard, the TMC will take control of the train to apply the brakes as appropriate. (*Id.*).

57. I-ETMS and the TMC are the industry standards for PTC systems that comply with the RSIA.

58. I-ETMS is the system of choice for each of the Big Four railroads. (Ex. N, PTC System Information (available at https://www.fra.dot.gov/Page/P0358)).

Siemens' Infringing Products

59. Siemens has been marketing products relating to PTC to customers in the United States since at least September of 2012. Among Siemens' products relating to PTC is Trainguard PTC.

60. Siemens' Trainguard PTC includes the Trainguard PTC Onboard Unit ("OBU"), Locomotive Messaging Server ("LMS"), Wheel Speed Sensor WIG 16P, and Dual GPS Receivers. (Ex. O, Trainguard PTC Flyer (downloaded from https://w3.usa.siemens.com/mobility/us/en/rail-solutions/rail-automation/train-control-system/Documents/Tainguard%20PTC%20Flyer.pdf) at 1).

61. Siemens' Trainguard PTC OBU is a counterpart of and directly competes with Wabtec's TMC.

62. Exhibit O describes aspects of Siemens' Trainguard PTC system as of April 1, 2014.

63. Trainguard PTC is designed to "prevent train accidents caused by human errors such as overspeed conditions or overrunning red signals." (Ex. P, "Siemens debuts PTC system," *Railway Age*, Sept. 24, 2012, at 1).

64. Exhibit P describes aspects of Siemens' Trainguard PTC system as of September 24, 2012.

65. The Trainguard PTC OBU, which is the Locomotive Segment of Siemens' products relating to PTC, "dynamically calculates the precise braking distance to the next signal or speed restriction with the aid of [a] speed sensor and GPS location determination systems[,] thereby preventing train-to-train collisions, over speed derailments, unauthorized entry into work zones, and train movement through a switch in improper position." (Ex. O, Trainguard PTC Flyer at 1).

66. The Trainguard PTC OBU performs "vital location determination" by "safely distinguish[ing] broken cables from locomotive standstill" using a speed sensor, "rul[ing] out systemic failure" through the use of "diverse GPS signal sources," and "calculat[ing] a safe and precise train position" using "sensor fusion algorithms." (Ex. Q, PTC Brochure (downloaded from https://w3.usa.siemens.com/mobility/us/en/rail-solutions/rail-automation/train-control-system/Documents/PTC_Brochure.pdf) at 2).

67. Exhibit Q describes aspects of Siemens' Trainguard PTC system as of September 19, 2012.

68. The Trainguard PTC OBU calculates braking distances using braking algorithms that have been "specifically optimized for heavy freight trains and commuter rail operations." (*Id*.). "Based on a comprehensive physical model of the train and its environment, the OBU dynamically calculates the precise braking distance to the next signal or speed restriction." (*Id*.).

69. The Trainguard PTC OBU includes a computer, and the "computer platforms provide sufficient reserves to run additional applications such as automatic train control." (*Id*.). The Trainguard PTC OBU performs location "determination with a combination of speed sensor and dual GPS receivers." (Ex. O, Trainguard PTC Flyer at 1).

70. Serving the communication function of Siemens' Trainguard PTC, Trainguard LMS "[r]uns the Meteorcomm ITCM protocol stack" and "[c]onnects the OBU to the locomotive data radio." (*Id*. at 2). Trainguard PTC integrates with a variety of communication systems and "all kinds of trackside beacons," allowing it to communicate with any type of Wayside Interface Unit ("WIU") regardless of operating environment. (Ex. Q, PTC Brochure at 2).

71. The various components of Trainguard PTC, specifically including the Trainguard PTC OBU, are manufactured in the United States by Siemens.

72. On information and belief, Siemens manufactures the components for Trainguard PTC at its Munhall, Pennsylvania facility.

73. Specifically, the Rail Automation arm of Siemens' U.S. operations "manufactures and engineers all of [Siemens'] Cab Signaling and Positive Train Control equipment" in Munhall, Pennsylvania. (Ex. D, Siemens' Factory Locations at 1).

74. The various components of Trainguard PTC, specifically including the Trainguard PTC OBU, are used in the United States by Siemens and its customers.

75. The various components of Trainguard PTC, specifically including the Trainguard PTC OBU, are offered for sale in the United States by Siemens.

76. The various components of Trainguard PTC, specifically including the Trainguard PTC OBU, are sold in the United States by Siemens.

77. On information and belief, Siemens has sold Trainguard PTC, including the Trainguard PTC OBU, in the United States to at least CSX.

78. Siemens also has been developing a Siemens BOS for CSX. CSX has advised Wabtec that it will be implementing Siemens' BOS as part of CSX's PTC solution to interface with Wabtec's TMC.

79. CSX is a significant Wabtec customer and user of Wabtec's I-ETMS, including but not limited to Wabtec's TMC.

80. As a result of developing its own BOS, Siemens may seek to replace Wabtec's TMC with the Trainguard PTC OBU at CSX and at other Wabtec customers.

Siemens' Knowledge of Wabtec's PTC-Related Patent Portfolio

81. Siemens had knowledge of the '140 Patent before the filing of Wabtec's counterclaims in the District of Delaware action.

82. Siemens had knowledge of the '764 Patent before the filing of Wabtec's counterclaims in the District of Delaware action.

83. Siemens had knowledge of the '463 Patent before the filing of Wabtec's counterclaims in the District of Delaware action.

84. Siemens is aware of the '140 Patent, the '764 Patent, and the '463 Patent because of Wabtec's marking of these patents on the I-ETMS computer display welcome screen.

COUNT I

INFRINGEMENT OF THE '140 PATENT

85. Wabtec incorporates by reference the allegations in Paragraphs 1 through 84 above.

86. The '140 Patent is generally directed to an "an operator warning system for use in connection with a locomotive having a horn system with a horn activation actuator and a horn device for producing a noise." (Ex. A, '140 Patent at Abstract). The onboard system includes a database that contains grade crossing data and is in communication with the horn system. (*Id*.). "The operator warning system also includes a warning device for providing an audio, visual and/or tactile indicator to an operator of the locomotive based upon the grade crossing data, locomotive data and/or actuation condition of the horn activation actuator." (*Id*.).

87. Siemens directly infringes, induces others to infringe, and/or contributorily infringes one or more claims of the '140 Patent, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, the Trainguard PTC OBU. Non-limiting examples of such infringement are provided below, based on the limited information currently publicly available to Wabtec

88. For example, Siemens infringes claim 1 of the '140 Patent, which recites as follows:

> 1. An operator warning system for use in connection with a locomotive having a horn system with a horn activation actuator and a horn device configured to produce a noise, the operator warning system comprising:
>
> an onboard computer system including a database including grade crossing data and locomotive data, the onboard computer system in communication with the horn system; and

> an onboard warning device configured to provide at least one of an audio, visual and tactile indicator to an operator of the locomotive based upon at least one of grade crossing data, locomotive data and actuation condition of the horn activation actuator.

89. Trainguard PTC, which is manufactured and sold by Siemens, satisfies each and every limitation of claim 1. The Trainguard PTC OBU supervises the location of the train and notifies the train crew when the horn should be sounded. The Trainguard PTC OBU is capable of providing an audio, visual, or tactile indicator to the operator of conditions related to grade crossings, locomotive data, and actuation condition of the horn. Grade crossing conditions include whether there is a quiet time associated with the grade crossing. The Trainguard PTC OBU monitors the horn to determine whether it has been activated. If the horn is required to be activated and the crew has not responded, then the Trainguard PTC OBU requests automatic sequencing of the horn. If the train crew manually sequences the horn, the Trainguard PTC OBU stops requesting automatic activation. A display unit in the locomotive cab notifies the train crew when a grade crossing has failed to activate, has only partly activated, or has suffered a partial activation. The Trainguard PTC OBU also includes a track database that contains all the features of the expected route, including the location of grade crossings.

90. In view of the foregoing, Siemens' manufacture, use, sale, offer to sell, and/or importation of Trainguard PTC directly infringes the '140 Patent in violation of 35 U.S.C. § 271(a).

91. Claim 23 of the '140 Patent recites as follows:

> 23. A method of improving locomotive operator vigilance for use in connection with a locomotive having a horn system with a horn activation actuator and a horn device configured to produce a noise, the method comprising the steps of:
>
> determining grade crossing data including at least one of grade crossing location, grade crossing identity, grade crossing regulation and grade crossing condition;
>
> determining horn activation requirement data for the grade crossing;

> determining locomotive data including at least one of locomotive position on a track, locomotive position within a consist, locomotive speed, locomotive direction of travel and locomotive operation parameter; and
>
> providing at least one of an onboard audio, onboard visual and onboard tactile indicator to an operator of the locomotive based upon at least one of grade crossing data, locomotive data, horn activation requirement data and actuation condition of the horn activation actuator.

92. The use of Trainguard PTC by Siemens and its customers satisfies each and every limitation of claim 23. As discussed above with reference to claim 1, Trainguard PTC, under the control of the OBU, is configured to store information relating to train grade crossings, determine when the train is approaching a grade crossing and what regulations apply to such a crossing, determine the horn sequencing requirements for such a crossing, and alert the operators when the grade crossing has failed or when the horn should be sounded.

93. Trainguard PTC sold by Siemens constitutes a material part of the method recited in claim 23 of the ‘140 Patent, being programmed to cause each of the method steps to be performed, and it is not a staple article or commodity of commerce suitable for substantial noninfringing use. Moreover, Siemens knows that Trainguard PTC is especially made or especially adapted for use in a manner that infringes the ‘140 Patent. Accordingly, Siemens’ sale of Trainguard PTC contributes to infringement of the ‘140 Patent by its customers in violation of 35 U.S.C. § 271(c).

94. Both by configuring Trainguard PTC to operate in a manner that Siemens knows infringes the ‘140 Patent, and by encouraging customers to use Trainguard PTC in a manner that Siemens knows infringes the ‘140 Patent, Siemens is inducing infringement of the ‘140 Patent by its customers in violation of 35 U.S.C. § 271(b).

95. Siemens’ infringement of the ‘140 Patent has caused and will cause Wabtec to suffer substantial and irreparable harm.

96. Siemens' infringement of the '140 Patent will result in loss of market leadership and loss of market share for Wabtec's I-ETMS system, including but not limited to Wabtec's TMC. Such losses cannot be adequately compensated for in money damages.

97. Siemens' infringement of the '140 Patent will expose Wabtec to loss of pricing discretion for I-ETMS and price erosion whose magnitude and adverse effects cannot be adequately compensated for in money damages.

98. Siemens' infringement of the '140 Patent has and will disrupt Wabtec's customer relationships, such as Wabtec's relationship with CSX. Such disruption will result in the formation of customer relationships between Siemens and Wabtec's existing customers, the adverse effects of which cannot be adequately compensated for in money damages.

COUNT II

INFRINGEMENT OF THE '764 PATENT

99. Wabtec incorporates by reference the allegations in Paragraphs 1 through 84 above.

100. The '764 Patent is generally directed to a system that, in accordance with particular embodiments, identifies a condition of an upcoming feature in a track network. (Ex. B, '764 Patent at Abstract). The system includes a positioning system, a track database, and a computer. (*Id.*). The computer obtains the estimated train position from the positioning system and identifies a condition for an upcoming feature based on track data and feature data contained in the track database. (*Id.*). While the train traverses its route, the feature data in the track database is dynamically updated. (*Id.*).

101. Siemens directly infringes, induces others to infringe, and/or contributorily infringes one or more claims of the '764 Patent, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling (directly or through intermediaries), and/or

importing, in this District and elsewhere in the United States, Trainguard PTC. Non-limiting examples of such infringement are provided below, based on the limited information currently publicly available to Wabtec

102. For example, Siemens infringes claim 1 of the '764 Patent, which recites as follows:

> 1. A system for identifying at least one condition of at least one upcoming feature of at least one track in a track network, the system comprising:
>
> a positioning system configured to determine an estimated train position on a track within a track network;
>
> at least one database comprising track data and feature data, which comprises at least one of the following: status data, condition data, fault data, activity data, equipment state data, primary safety device data, secondary safety device data, primary safety arrangement data, secondary safety arrangement data, primary implemented safety action data, secondary implemented safety action data; and
>
> a computer configured to:
>
> (i) obtain the determined estimated train position on at least one track from the positioning system; and
>
> (ii) for the at least one track, identify at least one condition for at least one upcoming feature based at least in part upon the track data and the feature data in the at least one database,
>
> wherein the at least one database is located in the train and the feature data in the at least one database located in the train is dynamically updated while the train is traversing the track in the track network.

103. Trainguard PTC, which is manufactured and sold by Siemens, satisfies each and every limitation of claim 1. The "positioning system" limitation is satisfied by the Dual GPS Receivers, which are capable of locating the train wherever in the world it is. (Ex. O, Trainguard PTC Flyer at 2). The "database" limitation is satisfied by a Track Database, which is stored in the Trainguard PTC OBU and provides data associated with the railroad tracks and includes all railroad specific track layout information, such as grade and curvature of the track and locations of grade crossings, hazard detectors, switches, and signals. The database is updated along the

route as approaching locomotives receive status information from WIUs, or by downloading new database files from the back office server. (*Id*.). The "computer" limitation is satisfied by the Trainguard PTC OBU itself, which performs location determination by communicating with the GPS receivers, and receives status information from WIUs to determine the state (*i.e.*, condition) of elements along the track, specifically the grade crossings, hazard detectors, switches, and signals.

104. In view of the foregoing, Siemens' manufacture, use, sale, offer to sell, and/or importation of Trainguard PTC directly infringes the '764 Patent in violation of 35 U.S.C. § 271(a).

105. Claim 21 of the '764 Patent recites as follows:

> 21. A computer-implemented method for identifying at least one condition of at least one upcoming feature of at least one track in a track network on at least one computer having a storage medium with instruction stored thereon, which, when executed by a processor at the at least one computer, implement the method comprising:
>
> (a) determining train position on at least one track;
>
> (b) dynamically updating at least one of track data and feature data in at least one database of the at least one computer while the train is traversing the track in the track network, wherein the at least one database is dynamically updated and located in the train and the feature data comprises at least one of the following: status data, condition data, fault data, activity data, equipment state data, primary safety device data, secondary safety device data, primary safety arrangement data, secondary safety arrangement data, primary implemented safety action data and/or secondary implemented safety action data; and
>
> (c) identifying at least one condition of at least one upcoming feature based at least in part upon the track data and the feature data.

106. The use of Trainguard PTC by Siemens and its customers satisfies each and every limitation of claim 21. As discussed above with reference to claim 1, Trainguard PTC, under the control of the OBU, is configured to perform, or to control the performance of, the various steps involved in determining train position, dynamically updating the track database, and identifying

the condition of Field Elements via status messages received from WIUs. (*See, e.g.*, Ex. O, Trainguard PTC Flyer at 2).

107. Trainguard PTC sold by Siemens constitutes a material part of the method recited in claim 21 of the '764 Patent, being programmed to cause each of the method steps to be performed, and it is not a staple article or commodity of commerce suitable for substantial noninfringing use. Moreover, Siemens knows that Trainguard PTC is especially made or especially adapted for use in a manner that infringes the '764 Patent. Accordingly, Siemens' sale of Trainguard PTC contributes to infringement of the '764 Patent by its customers in violation of 35 U.S.C. § 271(c).

108. Both by configuring Trainguard PTC to operate in a manner that Siemens knows infringes the '764 Patent, and by encouraging customers to use Trainguard PTC in a manner that Siemens knows infringes the '764 Patent, Siemens is inducing infringement of the '764 Patent by its customers in violation of 35 U.S.C. § 271(b).

109. Siemens' infringement of the '764 Patent has caused and will cause Wabtec to suffer substantial and irreparable harm.

110. Siemens' infringement of the '764 Patent will result in loss of market leadership and loss of market share for Wabtec's I-ETMS system, including but not limited to Wabtec's TMC. Such losses cannot be adequately compensated for in money damages.

111. Siemens' infringement of the '764 Patent will expose Wabtec to loss of pricing discretion for I-ETMS and price erosion whose magnitude and adverse effects cannot be adequately compensated for in money damages.

112. Siemens' infringement of the '764 Patent has and will disrupt Wabtec's customer relationships, such as Wabtec's relationship with CSX. Such disruption will result in the

formation of customer relationships between Siemens and Wabtec's existing customers, the adverse effects of which cannot be adequately compensated for in money damages.

COUNT III

INFRINGEMENT OF THE '463 PATENT

113. Wabtec incorporates by reference the allegations in Paragraphs 1 through 84 above.

114. The '463 Patent is generally directed to a train control system that, in accordance with particular embodiments, includes an on-board track database, a positioning system, and a control system that receives position data and automatically brakes the train prior to encountering an upcoming signal based on specified data points. (Ex. C, '463 Patent at Abstract). The control system does not brake the train if certain conditions are satisfied. (*Id*.).

115. Siemens directly infringes, induces others to infringe, and/or contributorily infringes one or more claims of the '463 Patent, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, Trainguard PTC. Non-limiting examples of such infringement are provided below, based on the limited information currently publicly available to Wabtec.

116. For example, Siemens infringes claim 1 of the '463 Patent, which recites as follows:

> 1. A train control system for controlling at least one train travelling in a track network comprising at least one track having at least one signal associated with a portion of the at least one track, the system comprising:
>
> an onboard track database comprising at least one of the following: train data, track network data, track data, signal data;
>
> a positioning system configured to determine position data directed to a position of the at least one train within the track network; and

an onboard control system configured to:

(i) receive position data from the positioning system and signal data from the track database; and

(ii) based upon at least one of the following: train data, track network data, track data, position data, signal data, train control data, authorization data signal aspect data, or any combination thereof, predictively enforce the next, upcoming signal by automatically braking the at least one train prior to encountering the next, upcoming signal, unless: (a) based at least partially on current signal aspect data, determination is made that it is safe to proceed towards the next, upcoming signal; (b) specified authorization data is received; or (c) specified train control data is received.

117. Trainguard PTC, which is manufactured and sold by Siemens, satisfies each and every limitation of claim 1. The "onboard track database" limitation is satisfied by the Track Database contained in the Trainguard PTC OBU, which includes all railroad-specific track layout information, including grade and curvature of the track and the locations of grade crossings, hazard detectors, switches, and signals. The "positioning system" limitation is satisfied by the Dual GPS Receivers, which determine train location anywhere in the world in reference to the track database. (Ex. O, Trainguard PTC Flyer at 2). The "onboard control unit" limitation is satisfied by the Trainguard PTC OBU itself, which derives and enforces movement authorities based on status messages received from WIUs. The status messages contain information on the condition of grade crossings or hazard detectors, the orientation of switches, and/or signal aspect data. Train operators can override signal indications, and can receive track bulletin cancellations from the back office server, preempting enforcement of movement authorities by the OBU. Enforcement is also preempted by proper handling of the train by the operator.

118. In view of the foregoing, Siemens' manufacture, use, sale, offer to sell, and/or importation of Trainguard PTC directly infringes the '463 Patent in violation of 35 U.S.C. § 271(a).

119. Claim 23 of the ‘463 Patent recites as follows:

> 23. A method for controlling at least one train travelling in a track network comprising at least one track having at least one signal associated with a portion of the at least one track, the method comprising:
>
> determining at least one of the following: train data, track network data, track data, signal data;
>
> determining position data directed to a position of the at least one train within the track network; and
>
> based upon at least one of the following: train data, track network data, track data, position data, signal data, train control data, authorization data signal aspect data, or any combination thereof, predictively enforcing the next, upcoming signal with a train control system by automatically braking the at least one train prior to encountering the next, upcoming signal, unless (a) based at least partially on current signal aspect data, a determination is made that it is safe to proceed towards the next, upcoming signal; (b) specified authorization data is received; or (c) specified train control data is received.

120. Use of Trainguard PTC by Siemens and its customers satisfies each and every limitation of claim 23. As discussed above with reference to claim 1, Trainguard PTC, under control of the OBU, is configured to perform, or to control the performance of, the various steps involved in generating and enforcing movement authorities based on signal data and train position in a track database. (*See, e.g.*, Ex. O, Trainguard PTC Flyer at 2).

121. Trainguard PTC sold by Siemens constitutes a material part of the method recited in claim 23 of the ‘463 Patent, being programmed to cause each of the method steps to be performed, and it is not a staple article or commodity of commerce suitable for substantial noninfringing use. Moreover, Siemens knows that Trainguard PTC is especially made or especially adapted for use in a manner that infringes the ‘463 Patent. Accordingly, Siemens’ sale of Trainguard PTC contributes to infringement of the ‘463 Patent by its customers in violation of 35 U.S.C. § 271(c).

122. Both by configuring Trainguard PTC to operate in a manner that Siemens knows infringes the ‘463 Patent and by encouraging customers to use Trainguard PTC in a manner that

Siemens knows infringes the '463 Patent, Siemens is inducing infringement of the '463 Patent by its customers in violation of 35 U.S.C. § 271(b).

123. Siemens' infringement of the '463 Patent has caused and will cause Wabtec to suffer substantial and irreparable harm.

124. Siemens' infringement of the '463 Patent will result in loss of market leadership and loss of market share for Wabtec's I-ETMS system, including but not limited to Wabtec's TMC. Such losses cannot be adequately compensated for in money damages.

125. Siemens' infringement of the '463 Patent will expose Wabtec to loss of pricing discretion for I-ETMS and price erosion whose magnitude and adverse effects cannot be adequately compensated for in money damages.

126. Siemens' infringement of the '463 Patent has and will disrupt Wabtec's customer relationships, such as Wabtec's relationship with CSX. Such disruption will result in the formation of customer relationships between Siemens and Wabtec's existing customers, the adverse effects of which cannot be adequately compensated for in money damages.

DEMAND FOR JURY TRIAL

Wabtec hereby demands a jury trial on all issues which can be heard by a jury.

CONCLUSION AND PRAYER FOR RELIEF

WHEREFORE, Wabtec respectfully requests that:

A. The Court find that Siemens has directly infringed, induced others to infringe, and/or contributorily infringed the Patents-in-Suit and hold Siemens liable for such infringement;

B. An order pursuant to 35 U.S.C. § 283 preliminarily and permanently enjoining Siemens, and anyone acting or participating by, through or in concert with

Siemens, from infringing, contributing to, and/or inducing infringement of Patents-in-Suit;

C. The Court award damages pursuant to 35 U.S.C. § 284 adequate to compensate Wabtec for Siemens' infringement of the Patents-in-Suit, including both pre- and post-judgment interest and costs as fixed by the Court;

D. The Court find that Siemens' infringement of one or more of the Patents-in-Suit has been willful;

E. The Court increase the damages to be awarded to Wabtec by three times the amount found by the jury or assessed by the Court;

F. The Court declare that this is an exceptional case entitling Wabtec to its reasonable attorneys' fees under 35 U.S.C. § 285;

G. The Court award Wabtec its costs and reasonable attorneys' fees; and

H. The Court grant Wabtec all other and further relief to which it may be entitled.

Dated: September 19, 2017

K&L GATES LLP

/s/ *Christopher M. Verdini*

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