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ACRONYMS AND ABBREVIATIONS

AAR	Association of American Railroads
ABS	Automatic Block Signals
ACES	Advanced Civil Speed Enforcement System (Amtrak-NEC)
APCO	Association of Public Safety Communication Officials
ARES	The Advanced Railroad Electronics System
ART	Accident Review Team
ARRC	Alaska Railroad Corporation
ASCAP	Axiomatic Safety Critical Assessment Process
ASES	Advanced Speed Enforcement System (NJT)
ATC	Automatic Train Control
ATCS	Advanced Train Control Systems
BN	Burlington Northern Railroad
BNSF	Burlington North and Santa Fe Railway Co.
CAD	Computer-aided Dispatching
CBTM	Communication-Based Train Management
CN	Canadian National
COTS	Commercial Off-the-Shelf
CP	Canadian Pacific Railway
CRAM	Corridor Risk Assessment Model
CTC	Centralized Traffic Control
CSXT	CSX Transportation, Inc.
DGPS	Differential Global Positioning System
ECP	Electronically Controlled Pneumatic (Braking)
EOT	End-of-Train Device
FCC	Federal Communication Commission
FEP	Front-end Processors
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
GIS	Geographical Information System
GPS	Global Positioning System
GWEN	Ground Wave Emergency Network
HRI	Highway Rail Intersections
HSPTC	High Speed Positive Train Control
IDOT	Illinois Department of Transportation
ITCS	Incremental Train Control System
ITS	Intelligent Transportation Systems

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MCP	Mobile Communication Package
MOW	Maintenance of Way
NS	Norfolk Southern Corporation
NSLS	Norfolk Southern Location System
NTSB	National Transportation Safety Board
OBC	Onboard Computer
OCS	Occupancy Control System
PLMR	Private Land Mobile Radio
PPA	PTC Preventable Accident
PPS	Precise Positioning Service
PTC	Positive Train Control
PTS	Positive Train Separation
RAIRS	Railroad Accident / Incident Reporting System
RAMS	Reliability, Availability, Maintainability, and Safety
RF	Radio Frequency
RSAC	Railroad Safety Advisory Committee
SPS	Standard Positioning Service
TEA 21	Transportation Equity Act for the Twenty-First Century
TFT	Track Forces Terminal
TMC	Traffic Management Center
TRB	Transportation Research Board
TWC	Track Warrant Control
UP	Union Pacific Railroad
UVA	University of Virginia
VMT	Vehicle Miles Traveled
WIU	Wayside Interface Unit
WLAN	Wayside Local Area Network

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Architecture - The organizational structure of a system or component. A system is a collection of components organized to accomplish a specific function or set of functions.

Auditory Alerts - The use of a sound or a series of sounds at predetermined intervals intended to alert one or more persons to a situation for which they may be unaware.

Automatic Block Signal System - A block signal system where the use of each block is governed by an automatic block signal, cab signal, or both. A roadway signal operated either automatically or manually at the entrance to a block.

Automatic Train Control (ATC) - A track-side system working in conjunction with equipment installed on the locomotive, so arranged that its operation will automatically result in the application of the air brakes to stop or control a train's speed at designated restrictions, should the engineer not respond. ATC usually works in conjunction with cab signals.

Automatic Train Stop - A track-side system working in conjunction with equipment installed on the locomotive, so arranged that its operation will result in the automatic application of the air brakes should the engineer not acknowledge a restrictive signal within 20 seconds of passing the signal. If the restrictive signal is acknowledged, ATS will be suppressed.

Benchmark - A standard of measurement or evaluation.

Block - A length of track of defined limits, the use of which by trains is governed by block signals, cab signals, or both.

Block Signal - A fixed roadway signal at the entrance of a block to govern trains and engines entering and using that block. The signal may be operated either automatically or manually.

Bridge Integrity Detector - A device consisting of a sensor or series of sensors installed for the purpose of detecting displacement or other damage to a bridge that would affect the safety of any equipment operating over the bridge.

Cluster Controller (CC) - A ground network node (in ATCS) responsible for the control of base stations.

Computer Aided Dispatching (CAD) - A computer-based dispatching system providing automatic train routing and in some installations, a paperless dispatcher environment. CAD contributes by guarding against the inadvertent conflicts in train movement authorities. CAD systems typically consist of computer hardware and specialized software programs designed for railroad applications. CAD systems may have enhanced existing TCS capabilities through a

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number of subsystems. Trains can be tracked and recorded automatically, and written movement authorities, where necessary, can be generated, recorded and filed completely within the computer system. These activities provide an added enhancement to train operations safety.

Dark Territory - Trackage that is non-sigaled, over which the movement of trains are governed by timetable, train orders/track warrants, or operating rules for the movement of trains in other than block signal territory.

DGPS - An enhancement to the Global Positioning System using differential techniques to improve accuracy. Differential techniques improve radio navigation system accuracy by determining position error at a known location and subsequently transmitting the determined error, or corrective factors, to users of the same radio navigation system, operating in the same area.

Electronically Controlled Pneumatic (ECP) Braking - A braking system used on high-speed electric passenger trains. Brakes are applied and released on each car through the action of electro-pneumatic valves energized by current taken from contacts on the motorman's brake valve and continuous train wires. Brakes can be applied instantaneously and simultaneously with this device, eliminating undesirable slack action and providing more positive control of train speed.

Fault-injection Simulation - A method by which software is tested by using other software to automatically insert an extensive amount of errors that would normally take years to occur.

Flat Wheel Detectors - A device consisting of a sensor or a series of sensors used to detect railroad wheels on trains that may exceed safe limits of flat spots on the tread that should normally be of constant curvature.

Flexible Blocks - A railroad operational concept whereby instead of track circuit blocks of fixed length being used to detect train position and assure train separation, blocks are determined dynamically to assure safe separation of all equipment on the line. The block length is calculated using real-time knowledge of the location, speed, direction, and braking performance characteristics of all equipment on the line.

Geographical Information System - An information system that is designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both a database system with specific capabilities for spatially-referenced data, as well as a set of operations for working [analysis] with the data. A system of hardware, software, and procedures designed to support the capture, management, manipulation, analysis, modeling and display of spatially-referenced data for solving complex planning and management problems.

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Global Positioning System (GPS) - A satellite-based radio navigation system deployed and operated by the Department of Defense, which provides highly accurate three-dimensional position, velocity, and time data to users worldwide.

Grade Crossing - An intersection of a highway with a railroad at the same level. Also, an intersection of two or more railroad tracks at the same elevation.

Highway-rail grade crossing - means a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.

Interoperability - The capability of PTC equipped trains, locomotives or other vehicles to operate safely on other railroads while maintaining at least the minimum (or core) PTC functionalities. The intent of PTC Interoperability includes the elimination of interline delay and standardization of operator interfaces.

Interlocking - An arrangement of signals and signal appliances so interconnected that their movements must succeed each other in proper sequence and for which interlocking rules are in effect. It may be operated manually or automatically.

Manual Block System - A block signal system wherein the use of each block is governed by block signals controlled manually or by block-limit signals or both upon information by telephone or other means of communication.

Maintenance-of-Way (MOW) - Having to do with the installation and maintenance of track and related structures to facilitate the operation of trains.

Maintenance-of-Way Worker - see Roadway Worker

Mobile Communications Package (MCP) - A vehicle-carried communications package that allows transmission and reception of data with other elements of a PTC system and with the vehicle and its operator to provide the on-board information and enforcement functions.

Overlay - To supplement, or overlay, an existing system of train control with a PTC system.

Positive Train Control (PTC) - A generic term (and acronym) used to describe any processor-based system of train control that will: (1) Prevent train-to-train collisions (positive train separation); (2) enforce speed restrictions, including civil engineering restrictions and temporary slow orders; and (3) provide protection for roadway workers and their equipment operating under specific authorities.

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PTC Preventable Accidents (PPA) - Accidents that a railroad industry group of subject matter experts determined to be preventable by PTC systems.

Radio frequency (RF) - Radio Frequency Spectrum - The entire range of electromagnetic communications frequencies administered by the Federal Communications Commission, including those used by radio, radar, and television . Several frequencies have been allocated to the railroad industry for the transmission of voice and digital data in connection with railroad operations. By agreement, the AAR serves as the clearing house for assignment of voice radio channels in order to prevent radio interference among the users.

Roadway Worker - Any employee of a railroad, or of a contractor to a railroad, whose duties include inspection, construction, maintenance or repair of railroad track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities or roadway maintenance machinery on or near track or with the potential of fouling a track, and flagmen and watchmen/lookouts.

Rolling Stock - A general term used when referring collectively to a large group of railway cars.

Safety-critical Benchmarks - A designation placed on a system, subsystem, element, component, device, or function denoting that satisfactory operation of such is mandatory to assurance of patron, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

Severity - The degree of impact that a requirement, module, error, fault, failure, or other item has on the development or operation of a system.

Signal Indication - The information conveyed by the aspect of a fixed signal or cab signal.

Switch (Track) - A pair of switch points with their fastenings and operating rods providing the means for establishing a route from one track to another.

Test Bed - As used in this report, a section of track where prototype signal systems can be installed and tested under controlled operating conditions.

Track - An assembly of rails, ties, and fastenings over which cars, locomotives, and trains are moved.

Track Circuit - An electrical circuit of which the rails of the track form a part.

Train - A locomotive or more than one locomotive coupled, with or without cars.

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Train Control System - The system for controlling train movement, enforcing train safety, and directing train operations.

Train Orders - Mandatory directives governing the movement of trains.

Validation - The process of determining whether the system or component complies with the objectives and system requirements during and/or at the end of the development cycle. That is... Did we build the right system?@

Verification - The process of determining whether the system or component outputs of a given phase of the development cycle fulfill the requirements established at the start of that phase. That is... Did we build the system correctly?@

Watchman/lookout - An employee who has been annually trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment.

Wayside Equipment - Train control or movement apparatus which is located along the track or wayside as opposed to the control center or other remote location.

Wayside Interface Unit (WIU) - An element of a PTC field system providing the interface with switches, signals, grade crossings and other devices for continuous monitoring and communication of their status to the central control offices, locomotives, or other users.

Wayside Local Area Network (WLAN) - the WIU to WIU-S link using spread spectrum radio.

Wayside Signal - A signal of fixed location along the track right-of-way.