Wabtec's I-ETMS®

APTA Rail Conference
June 3, 2013



I-ETMS® Segments



Wayside Segment

- Signal Status
- Switch Status
- Radio Frequency Communication



Office Segment

- Train Data
- Authorities
- Restrictions

Communications Segment

- RF Base Stations802.11
 - •Cellular



Locomotive Segment

- Onboard Computer & Display
 - GPS
 - RF Communication





Wabtec Segment Partcipation

- Locomotive Segment
 - On-Board Computer & Display
 - GPS
 - Fabrication and Locomotive Connectivity
- Office Segment
 - Back Office Server (BOS)
 - TMDS[™] Dispatch Systems
- Wayside Segment
 - Wayside Interface Unit Design & Installation



Product Overview

- Train ManagementComputer
 - Accepts & Validates Operating Data from Peripheral Devices, Office Segment and Wayside Segment
 - Determines Train Location, Speed
 - Enforces Authorized Train Movement
- ☐ Cab Display Unit
 - Human Interface to I-ETMS Functions







Product Overview

- Crash Hardened Onboard PTC Recorder
 - Records PTC and Event Recorder Data
- ☐ TMDS Train Management Dispatch
 - Dispatcher Control of Train Movements
 - Dispatcher Interface to Wayside Signal Equipment
 - Convey Mandatory Directives and Train Sheet Data to Back Office Server
- □ PTC Back Office Server
 - Transmits Authority, Bulletin And Train Consist Messages Generated by a Train Dispatching System to Locomotives
 - Transmits Locomotive Status and Events to a Train Dispatching System
 - Maintains Locomotive Software Configuration

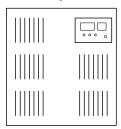




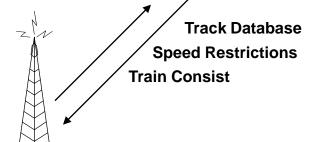




Office Systems



 Before a train leaves its originating terminal all relevant information is downloaded from the ETMS[®] back-office systems

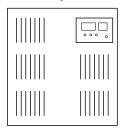




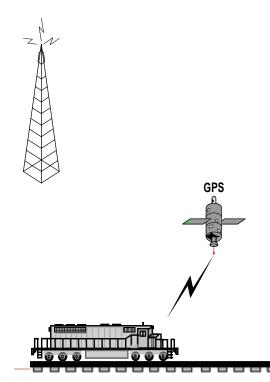
Initialization



Office Systems

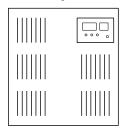


 GPS works in conjunction with the on-board geographic track data base to determine train location





Office Systems





 As the train moves, the ETMS[®] onboard computer constantly calculates a warning and braking curve based on all current operational data

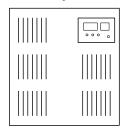
Predictive Braking

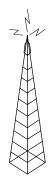
Warning Curve

Braking Curve

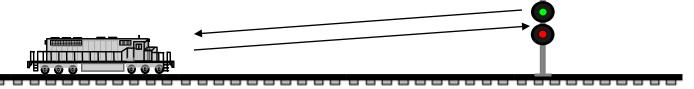


Office Systems





 As the train moves, ETMS[®] pings wayside devices checking for broken rails, proper switch alignment, and signal aspects





Wabtec Services Support

- □ Installation, Training and Support
 - Technical Support or Turn Key Installation
 - Installation Training Services
- PTC Track Data Generation
 - Complete Generation and Verification Services
 - Generation and Verification Tools support
- Wayside Signal and Communication Design Services
- Systems Integration Program Administration
- Regulatory Support



Thank You!

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