



Communication Based Overlay Signal System Project Status

Board of Directors
August 6, 2015
Agenda Item 9



Background

- Issue Communications Based Overlay Signal System Design/Procure/Install Turn-key RFP: August 2010
- Awarded Prime Contact: October 2011
- Executed a Service Agreement with California High Speed Rail Authority (HSR11-04) for Federal Railroad Administration Funding: December 2011
- Issued Notice to Proceed to Parson Transportation Group: Jan. 27, 2012
- Executed Fiber Optic Option: April 26, 2012
- Exercised Option 1 (Phase 2): April 30, 2013
- Exercised Option 2 (Phase 3): Aug. 1, 2013
- Exercised Option 2 (Phase 4): Dec. 4, 2014



CBOSS Project Requirement

Positive Train Control (Rail Safety Act 2008)

- Prevent Train-to-Train Collisions
- Prevent Overspeed Derailments
- Prevent Incursions into Established Work Zones
- Prevent Movement through a Misaligned Switch

Additional Requirements

- Enhanced Crossing Safety / Performance
- Improved Headways and Operational Flexibility
- Enforcement of Scheduled Station Stops
- Schedule Management
- Employee in Charge

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CBOSS Project Solution Overview

- Interoperable - Incremental Train Control System
- Commuter Rail Solution
- Communications Based Train Control System Designed as an Overlay to the Existing Signal System
- Provides Enforcement of Signal Indications, Civil Speed Limits, Employee in Charge and Temporary Speed Restrictions
- Provides Advanced Start of Public Crossings and Restricted Speed enforcement Over Hand-operated Switches
- Uses Radio Frequency Data Link to Send Wayside Status Information to Trains

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Project Major Accomplishments

- Completed All Work in Phase 1
- Received FRA Conditional Type Approved for I-ITCS
- Fiber Optic Backhaul Installation Nearing Completion
- Completed Back Office Control Center Build Outs
- Completed Office Subsystem Installation
- Completed Installation of All Wayside Interface Units
- Completed Erection of All RF Base Stations
- Onboard Installation is 95% Complete
- Completed Milepost Recalibration (not yet cutover)
- Continued community outreach for Installation and testing of Data Communication and Wayside Subsystems.

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Project Key Milestones

| | Project Key Milestones | Planned Baseline Finish | Actual/ Forecast Finish |
|----|--|-------------------------|-------------------------|
| 1 | JPB Issued Notice to Proceed to PTG – Phase 1 | Jan 2012 | Jan 2012 |
| 2 | Completion of Preliminary Design Review and Acceptance | Sept 2012 | Nov 2012 |
| 3 | Completion of Critical Design Review and Acceptance | Feb 2013 | Jun 2013 |
| 4 | Completion of Final Design Review and Acceptance | Jul 2013 | Jun 2014 |
| 5 | Complete Factory Integrated Systems/Subsystem Demo | Sept 2014 | Apr 2015 |
| 6 | Completion of Data Communication Subsystem (DCS) Installation and Verification | Sept 2014 | Apr 2015 |
| 7 | Completion of Field Subsystem Installation and Verification | Jan 2015 | Mar 2015 |
| 8 | Completion of Onboard Subsystem Installation and Verification | Jun 2015 | Aug 2015 |
| 9 | Complete build out of BCCF for CBOSS PTC | Feb 2014 | Sept 2014 |
| 10 | Commence FRA Pilot Section Demonstration | Oct 2014 | May 2015 |
| 11 | Submit Revenue Service Demonstration Application (including PTC Safety Plan) | Jul 2015 | Oct 2015 |
| 12 | Revenue Service Demonstration | Oct 2015 | Dec 2015 |
| 13 | Final System Acceptance | May 2016 | Jun 2016 |

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Project Total Installed Cost Update

| Description | Turn-key Contractor Cost | Total Project Cost |
|---|--------------------------|--------------------|
| Project Planning and Procurement | 0 | \$4.6MM |
| Phase 1 - Contract NTP – Critical Design | \$16.3MM | \$22.8MM |
| Phase 2 - Final Design and DCS Installation Including Fiber Backbone | \$35.3MM | \$53.7MM |
| Phase 3/4 - Field Installation, Testing and Commissioning through Acceptance & Warranty | \$87.6MM | \$149.9MM |
| Total | \$139.2MM | \$231.0 MM |

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FRA Safety Certification Process

- Congress passed the Rail Safety Improvement Act in 2008 requiring the operation of PTC in revenue service by 12/31/15.
- FRA is responsible to Congress for ensuring compliance with RSIA 2008.
- FRA created Rules and a Process for Railroads to follow to achieve PTC Safety Certification and ensure ongoing compliance with RSIA 2008.

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FRA Safety Certification Process

- FRA PTC Safety Certification process requires Revenue Service Demonstration as a prerequisite to PTC Safety Certification:
 - FRA was on site during the period July 20-23 to begin witnessing Caltrain Segment #3 field testing.
 - After successful FRA witness of Segment #3 testing, Caltrain submits an application for RSD. The PTC Safety Plan will be submitted with the RSD Application.
 - Caltrain follows with submittal of Segment #2 and Segment #1 test results
 - FRA Approves RSD Application
 - Caltrain begins PTC Revenue Service Demonstration

Activities from RSD to System Acceptance

- Major Activities: FRA Approved Revenue Service Demonstration through System Acceptance
 - FRA RSD Granted
 - Monthly reporting to FRA of CBOSS PTC operating results and statistics throughout RSD period.
 - RAMS Testing (RSD + 6 months)
 - Implement Long-term Maintenance and Support Agreement
 - CBOSS PTC FRA Safety Certification: FRA reviews Caltrain Operating results and when satisfied that CBOSS PTC system is operating safely and reliably will approve PTCSP and grant Safety Certification for CBOSS PTC System (timeframe undefined by FRA)
 - CBOSS PTC System Acceptance

Challenges

- I-ITCS Software Release Delays
- Contractor Execution of Test Plans and Schedules
- Interoperability: UPRR requires that JPB execute an Interoperability Agreement and pay all UPRR expenses associated with establishing and maintaining interoperability
- FRA Revenue Service Demonstration application: No written FRA guidelines
- Long-term Maintenance and Support

Next Steps

- Complete Cab Software Release and Factory Testing (August 2015).
- Continue Segment #3 Pilot Testing and FRA Witness Testing
- Complete All Wayside and Communications Subsystem Testing
- Cut-over and begin using new mileposts
- Verify all base station towers have acceptable coverage
- Submit RSD Application (including PTCSP)
- Complete Onboard Installation
- Complete Segment #2 and Segment #1 Testing
- CBOSS PTC Initial Revenue Service by Dec. 31, 2015



Questions?

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