Communication Based Overlay Signal System Project Status

Board of Directors
May 7, 2015

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 (NTP) to Parson Transportation Group - January 27, 2012
- Executed Fiber Optic Option - April 26, 2012
- Exercised Option 1 (Phase 2) – April 30, 2013
- Exercised Option 2 (Phase 3) – August 1, 2013
- Exercised Option 2 (Phase 4) – December 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

CBOSS Project Solution Overview

- Interoperable - Incremental Train Control System (I-ITCS)
- 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 (EIC) and Temporary Speed Restrictions
- Provides Advanced Start of Public Crossings and Restricted Speed enforcement Over Hand Operated Switches
- Uses a Radio Frequency (RF) Data Link to Send Wayside Status Information to the Trains

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 (WIUs)
- Completed Erection of 12/14 RF Base Stations
- On Board Installation is 55% Complete
- Completed Milepost Recalibration
- Continued community outreach for Installation and testing of Data Communication and Wayside Subsystems.

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

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

FRA Safety Certification Process

- FRA Witness Testing
  - Informal invitation for database validation of test segment has been sent to the FRA
  - FRA may choose to witness field testing for test segment (segment #3)
  - Caltrain to submit PTC Safety Plan including test results for segment #3.
- FRA Revenue Service Demonstration (RSD):
  - After successful FRA witness of segment 3 testing Caltrain submits an application for RSD
  - Caltrain follows with submittal of Segment #2 and Segment #1 test results
  - FRA Approves RSD Application
  - Caltrain begins PTC Revenue Service Demonstration

PTC CBOSS Activities from RSD to System Acceptance

- Major Activities- FRA Approved Revenue Service Demonstration (RSD) 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
  - Contract for JPB Owner's Team
  - CBOSS PTC FRA Safety Certification - FRA reviews Caltrain Operating results and when satisfied that CBOSS PTC system is operating safely will approve PTCSP and grant Safety Certification for CBOSS PTC System (timeframe undefined by FRA)
  - CBOSS PTC System Acceptance

Challenges

- GE software release delays
- Interoperability - UPRR requires that JPB execute and Interoperability Agreement and pay all UPRR expenses associated with establishing and maintaining interoperability.
- FRA Revenue Service Demonstration application & beyond - learn as you go – no written FRA guidelines
- Long Term Maintenance and Support

CBOSS PTC - Owner's Project Team

- Multi-disciplined/Cross Functional
  - Data and RF communications; wayside signal, control systems, on-board, rail system safety, system integration
- Effective and Cohesive unit
- Understanding PTC technology and continuity of project knowledge.
- Solid Rail Operations and System Engineering experience

Next Steps

- Complete Cab Software Release and Factory testing (May 2015).
- Commence Segment 3 Pilot Testing and FRA Witness Testing
- Complete All Wayside and Communication Subsystem Testing
- Submit RSD Application (including PTCSP)
- Complete On-Board Installation
- CBOSS PTC Initial Revenue Service by December 2015

Questions?

CaltrainPTC@samtrans.com

Caltrain PTC