Communication Based Overlay Signal System Project Status

Board of Directors
November 5, 2015
Agenda Item 9

Legislative Update
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
Project Key Milestones

<table>
<thead>
<tr>
<th>Milestone Description</th>
<th>Planned Baseline Finish</th>
<th>Actual/Forecast Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 JPB Issued Notice to Proceed to PTG - Phase 1</td>
<td>Jan 2012</td>
<td>Jan 2012</td>
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<tr>
<td>2 Completion of Preliminary Design Review and Acceptance</td>
<td>Sept 2012</td>
<td>Nov 2012</td>
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<tr>
<td>3 Completion of Critical Design Review and Acceptance</td>
<td>Feb 2013</td>
<td>June 2013</td>
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<tr>
<td>4 Completion of Final Design Review and Acceptance</td>
<td>Jul 2013</td>
<td>Jun 2014</td>
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<tr>
<td>5 Completion factory Integrated Systems/Subsystem Demo</td>
<td>Sept 2014</td>
<td>Apr 2015</td>
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<tr>
<td>6 Completion of Data Communication Subsystem (DCS) Installation and Verification</td>
<td>Sept 2014</td>
<td>Apr 2015</td>
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<tr>
<td>7 Completion of Field Subsystem Installation and Verification</td>
<td>Jan 2015</td>
<td>Mar 2015</td>
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<tr>
<td>8 Completion of Onboard Subsystem Installation and Verification</td>
<td>Jun 2015</td>
<td>Aug 2015</td>
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<tr>
<td>9 Complete build out of BCCF for CBOSS PTC</td>
<td>Feb 2014</td>
<td>Sept 2014</td>
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<tr>
<td>10 Commence FRA Pilot Section Demonstration</td>
<td>Oct 2014</td>
<td>May 2015</td>
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<tr>
<td>11 Submit Revenue Service Demonstration Application</td>
<td>Jul 2015</td>
<td>Q1 2016</td>
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<tr>
<td>12 Revenue Service Demonstration</td>
<td>Oct 2015</td>
<td>Q2 2016</td>
</tr>
<tr>
<td>13 Final System Acceptance</td>
<td>May 2016</td>
<td>Q2 2016</td>
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Project Total Installed Cost Update

<table>
<thead>
<tr>
<th>Description</th>
<th>Turn-key Contractor Cost</th>
<th>Total Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Planning and Procurement</td>
<td>0</td>
<td>$4.6MM</td>
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<tr>
<td>Phase 1 - Contract NTP – Critical Design</td>
<td>$16.3MM</td>
<td>$22.8MM</td>
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<tr>
<td>Phase 2 - Final Design and DCS Installation Including Fiber Backbone</td>
<td>$35.3MM</td>
<td>$53.7MM</td>
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<tr>
<td>Phase 3/4 - Field Installation, Testing and Commissioning through Acceptance &amp; Warranty</td>
<td>$87.6MM</td>
<td>$149.9MM</td>
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<tr>
<td>Total</td>
<td>$139.2MM</td>
<td>$231.0 MM</td>
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CBOSS PTC Project Status

- On-Board Equipment Installation Complete
- Wayside Interface Unit Installation and FRA Official Validation Testing Complete
- Fiber Optic Cable Installation Complete
- Base Station Installation Complete
- Dynamic Testing On Test Train Continues
- High Rail Testing for FRA Official Critical Assets Continues
- BCCF Build-out Complete; CBOSS PTC Testing being Conducted from BCCF Facility

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
  - Process Associated with Schedule Extension is Undefined
  - Revenue Service Demonstration Application: No Written FRA Guidelines
Schedule Mitigation Activities

• Improve Dates for Delivery I-ITCS Software Releases
• Increase the Productivity of Contractor Testing of the System
• Increase the Number of Technical Resources
• Increase Access to the Railroad for Testing
• Focus on Stabilizing the Infrastructure
• Improve Date for PTC Safety Plan Development
• Initiate Planning of Interoperability Testing with Caltrain Tenant

Next Steps

• Complete Cab Software Release and Factory Testing
• Complete 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
• Complete Segment #2 and Segment #1 Testing
Questions?

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