

Caltrain CBOSS PTC Project Frequently Asked Questions

Caltrain, the commuter-rail system that operates along the San Francisco Peninsula into the Silicon Valley, is constantly working to improve the efficiency and safety of its system. The following are frequently asked questions about Caltrain's Communications Based Overlay Signal System (CBOSS) Positive Train Control (PTC) Project, a vital system that will improve the safety and reliability of all passenger rail operations that use the Caltrain corridor.

Why is the Caltrain CBOSS PTC Project needed for Caltrain?

The Caltrain CBOSS PTC Project is needed to meet two specific criteria:

- To meet the federal mandate to implement PTC by 2015; and
- To increase system operational capacity to meet increases in demand.

The Caltrain CBOSS PTC Project will procure an advanced signal system that will meet both criterions.

What is the Federal PTC Mandate?

In response to a fatal train collision in September 2008, Congress passed the Rail Safety Improvement Act (RSIA) of 2008 which updated the Code of Federal Regulations (CFR) to require PTC to be installed along every passenger rail corridor prior to December 31, 2015.

For Caltrain, the core safety enhancements provided by PTC include the prevention of:

- Train-to-train collisions by enforcing movement authority limits;
- Over-speed derailments by enforcing speed limits; and
- Incursions into established work zones by protecting track work zones throughout the corridor.

The PTC mandate will also require that host and tenant railroads must be equipped with PTC solutions that are interoperable, i.e. allow trains to freely and safely move between the different railroads. This is important to Caltrain as its tenant operators include other commuter railroads, freight, and future high-speed train service.

What are the benefits unique to the Caltrain CBOSS PTC Project?

The Caltrain CBOSS PTC Project specifies additional capabilities, beyond those found in current PTC systems, to enable increased safety and operating performance for Caltrain and future high-speed rail service. These additional benefits include:

- Increased operating performance of the current signal system, enabling more frequent and dependable passenger service to meet growing demand;
- Improved grade crossing warning functions;
- Enforced scheduled station stopping;
- Integrated communication among all subsystems (such as the central control facility, train and wayside) for improved safety performance for highway vehicles and the riding public; and
- Safe operations between Caltrain and other tenant railroads including future high-speed rail.

What is limiting Caltrain's system operational capacity?

Caltrain has so far been able to meet the year to year increases in customer service demands. However, Caltrain's system capacity, the number of trains it can operate on the current infrastructure, has now reached a point where any significant service increases are not possible. The most crucial factor

constraining the system capacity is the wayside signal system. Therefore in early 2008, Caltrain began the Caltrain CBOSS PTC Project to develop advanced signal system requirements that include PTC in order to extend safety functions and operational performance enhancements to overcome the constraints imposed by the current conventional wayside signaling and crossing warning systems to enable future service increases.

Caltrain is also proposing to operate European electric-multiple unit (EMU) trains that are more efficient than the current diesel-powered locomotives. These EMUs will help improve operational capacity as EMUs can accelerate and decelerate faster than diesel trains. This means EMUs can stop at more stations than the current diesel fleet in the same amount of time or can stop at the same amount of stations in less time. In May 2010, the Federal Railroad Administration granted a waiver to Caltrain allowing mixed-use operations of CFR-compliant vehicles (all trains currently operating on Caltrain tracks) with EMUs. This waiver is conditional upon three criteria:

- EMU crashworthiness will meet or exceed crashworthiness performance levels presented in the petition.
- CBOSS PTC system meets the requirement of FRA's PTC system regulation (49 CFR Part 236, subpart I).
- Grade crossing improvements identified in the petition are fully completed before EMU are operated.

Interoperability: What is it, why is it needed, and how will it be achieved?

A key provision of RSIA is that host and tenant railroads must be equipped with PTC solutions that are interoperable, i.e. allow trains to freely and safely move between the different railroads.

The Caltrain CBOSS PTC Project will ensure that Caltrain, the host railroad, is interoperable with its tenant operators, which include:

- Union Pacific Railroad (UPRR), which operates freight rail service; and
- Passenger rail operators including Capitol Corridor Joint Power Authority, Altamont Commuter Express (ACE), and Amtrak.

In addition, the California High Speed Rail Authority (CHSRA) or its designated operating agent is considered a future tenant operator with planned HSR service between San Francisco and San Jose.

Class 1 railroads in the United States have formed the Interoperable Train Control Committee that is in the process of developing protocol/communications standards to provide for interoperability. Caltrain and its tenant operators, which are all Class 1 railroads, have committed to following the developed interoperability standards. The signal system and on-board equipment to be developed and procured through the Caltrain CBOSS PTC Project will utilize these standards to ensure interoperability to enable transparent and seamless operation on tracks belonging to Caltrain and the UPRR.

Why not procure an off-the-shelf PTC product instead?

The most promising radio-based PTC technologies are in the development stage and, while they show great promise for the railroad industry, all have been designed largely to respond to the needs of the freight rail industry and are not tailored for unique requirements for passenger rail operations. PTC provides core safety capabilities that are intended to benefit all operators. However, the manner in which intervention mechanisms are implemented may result in decreased operating performance if care is not taken to incorporate specific passenger operating needs. The specifications of the signal system designed for the Caltrain CBOSS PTC Project have been developed to meet the core safety functions of PTC and to fill in the gaps by addressing specific passenger rail and Caltrain needs.

What Caltrain's RFP is Procuring?

Caltrain is procuring a complete and fully functional PTC system that is integrated with Caltrain's existing systems and which is in compliance with federally mandated requirements described in the Rail Safety Improvement Act and Federal Railroad Administration (FRA) Final Rule for PTC systems. The scope of work includes:

- Design, procurement, manufacture, installation, and testing, inclusive of any necessary modifications to Caltrain's systems, subsystems, vehicles and facilities
- Provide Caltrain PTC system fixed infrastructure that is interoperable with Caltrain's tenant railroads' PTC equipped trains.
- Safety engineering and system safety certification
- Training simulator and training service
- Provide updated Caltrain operating rules, maintenance and inspection procedures and other documents required to support the operation and maintenance of the Caltrain PTC system
- Coordination and support of FRA requirements
- System integration, project Coordination and management

Caltrain CBOSS PTC system consists of the following major elements:

- Wayside Subsystem
- Data Communications Subsystem including backhaul system
- On-Board Subsystem
- Back Office Subsystem
- Employee in Charge (EIC)
- Backup Control Center Facility (BCCF)

Please send your questions to caltrainptc@samtrans.com