

FRA FY14 Grant Application Solicitation

ADDITIONAL INFORMATION ON POSITIVE TRAIN CONTROL RESEARCH AND DEVELOPMENT FOCUS AREAS

The Rail Safety Improvement Act of 2008 mandated the development and deployment of Positive Train Control (PTC) to improve train movement safety. The FRA is currently soliciting applications for projects that will benefit the overall implementation of PTC on freight, intercity passenger, and commuter railroads. Given that the amount of funding available is not likely sufficient to cover the costs necessary to deploy PTC on any given railroad, applications should focus on the research and development of technologies that will lower the costs, speed implementation, increase interoperability, and improve the reliability of positive train control systems. The FRA is particularly interested in advancing research and development on the following topics related to PTC:

Cybersecurity and Wireless Communications Security

The PTC system uses radio frequency (RF) networks to convey movement authorities to locomotives, wayside equipment, and train status information using Software Defined Radios (SDRs). SDRs provide additional levels of security resulting from the extensive configuration management focused on preventing software and RF based attacks. However, this added security requires additional bandwidth, which is very limited. Therefore, the FRA seeks research to advance communication security management technologies. The research objective is to increase the security of wireless message transmissions between control centers, trains, and wayside locations while maintaining reliability without increasing bandwidth use or incurring any latency in message delivery.

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Back-Office Reliability

The FRA is seeking to support applied research leading to improvements in the engineering of PTC infrastructure systems (office, way, onboard, and communications) for resilience and sustainability without excluding other key performance issues. Areas of interest include intra- and inter-physical, information and behavioral dependencies of PTC infrastructure systems, PTC infrastructure management, implementation and construction engineering. Special emphasis is on the design, construction, operation, and improvement of PTC infrastructure networks with a focus on systems engineering and design, performance management, risk analysis, life-cycle analysis, modeling and simulation, behavioral and social considerations not excluding other methodological areas or the integration of methods.

Deployment of an Interoperable Train Control Messaging (ITCM/ITCSM) Shared Network for Short Lines and Commuter Railroads

PTC interoperability enables the free movement of different freight and passenger trains in multiple railroad territories safely. This requires the design and deployment of a train control system that is adhered to by all the operating railroads. As such, all the Class I freight railroads are implementing a fully connected PTC network using 220 MHz common carrier frequencies and radio hardware.

The short lines and commuter railroads need to be integrated into this network, which requires a significant investment in information technology capital and human resources. The FRA is interested in researching and developing a common solution that reduces the investment burden as well as minimizes the efforts required by the commuter and Class I railroads to implement interoperable messaging functions among multiple organizations.