



IRIDIUM® ENABLES POSITIVE TRAIN CONTROL

The Iridium satellite network enables reliable IoT solutions that help improve safety on railroads, anywhere tracks run. Iridium technology helps deliver critical data about locomotives including diagnostics, engine information, brake times, and signaling, as well as the status and condition of other onboard systems.

THE CHALLENGE

Radio technology has been the mainstay of rail communication for over a century. As such, there are many providers that specialize in railroad solutions and enable Positive Train Control (PTC) using radio communications. Most of these providers are software developers or technology companies specializing in logistics, but not telecommunication networks or hardware, meaning many of these companies cannot comply with regulatory mandates alone. To meet all requirements, railway operators need a robust communications network and IoT devices capable of transmitting data even when radio

COMPANY	CHALLENGES	BENEFITS
<ul style="list-style-type: none"> ■ Global Satellite Engineering (GSE) is a design firm that combines next-generation technology with satellite and terrestrial communications to provide innovative solutions for industries including aerospace, security, marine, mining, and the military. ■ Iridium commands the world's furthest reaching network, making it the only truly global communications company. Iridium voice and data products provide superior communications solutions that allow global companies, government agencies, and individuals to stay connected everywhere. 	<ul style="list-style-type: none"> ■ Railway operators must meet complex regulatory guidelines for secondary communication and PTC. ■ Railroad operations are complicated and often difficult to navigate, even among the companies themselves. ■ Railroad operators need a robust communications network and IoT devices capable of operating when radio communications are not available. 	<ul style="list-style-type: none"> ■ GSE products enabled by the Iridium network help railroad companies meet regulatory mandates. ■ Portal administrators can track the behavior of each train and send reports to operators about unsafe movement in near-real-time. ■ The Iridium network provides global communications, extending connectivity beyond where traditional radio covers, and enabling communications even when emergencies or natural disasters affect the ability of radio to operate normally.

communications are not available. The communications system should also work in tandem with PTC, which is designed to prevent train-to-train collisions. To achieve these goals, the rail operators must turn to best-in-class satellite communication network and hardware providers.

THE SOLUTION

Global Satellite Engineering is an engineering firm that provides creative solutions through both existing hardware and innovative developments to satisfy customer needs. Their railway clients immediately needed hardware to provide a backup means of communication on a network that mirrors the size and availability of the radio networks already in place. The device would also need to have additional capabilities to work with PTC systems and allow telemetry data to be gathered and transmitted at the client's request.

Iridium and partner GSE worked together to create a complete end-to-end solution for the customer. The powerful, intelligent, and versatile communications system is designed to work in remote locations anywhere in the world. The Iridium satellite network enables the solution to operate as a telephone, internet gateway, intelligent GPS device, and SMS text message transmitter. It also provides Internet access to remote hosts by attaching to other communications devices through RS232, Wi-Fi or Ethernet cables.

GSE MCG-101



GSE introduced the MCG-101 enabled by the Iridium network to help railroad companies meet the new U.S. government requirements for improving communications and safety protocols. The device fulfills a critical backup communications mandate for the railroad operators. It also provides a solution that functions like radio and works anywhere in the world. The MCG-101 unit comes standard with a traditional handset for voice communication, but also allows users to run VoIP services on other devices via Wi-Fi or direct connection. The MCG-101 also offers improved audio call quality compared to the older radio handsets many railroad companies still use.

Service Provider: Global Satellite Engineering (GSE)

Enabling Product: GSE MCG-101

Enabling Services: Iridium Short Burst Data® (SBD®) and Iridium Core 9523 Transceiver

The second requirement of the new mandate required railroad operators to install safety technology providing PTC. The MCG-101, which uses Iridium Short Burst Data®, provides tracking information which offers insight into maintenance and day-to-day operations of a locomotive for the railroad company. The MCG-101 processes small packets of data gathered by instruments, sensors, and other existing PTC hardware products and then sends those packets over the Iridium network to a portal where administrators can track the behavior of each train running on the system. If a train shows signs of trouble, portal administrators can send alerts directly to the operator about potential unsafe behavior or circumstances.

THE RESULT

Working with railway companies in the United States and their PTC service providers, Iridium and GSE are able to offer solutions that will help railroad companies meet the new U.S. government mandate requirements. By using the MCG-101, train operators can now use the Iridium network to speak with dispatch locations on clearer connections that operate further than traditional radio networks and work even when emergencies or natural disasters strike.

The PTC service providers are also able to access data services provisioned over the Iridium network through MCG-101 devices. This allows the railway operators to utilize internet-over-satellite and stay current with new information transmitted from other offices or dispatch locations, while also transmitting important telematics data from the locomotives themselves. This results directly in lowering operational costs and limiting potential safety issues. Additionally, the tracking ability of the MCG-101 units enabled by Iridium Short Burst Data® allows both the service providers of PTC and dispatch units to understand where their locomotives are and potential delivery and departure times.

What began as a mandate to improve communications and safety protocols now allows railroad operators to attain a complete communications and telemetry solution that enables several technologies from multiple sources. The Iridium network behind GSE's products now provides the means for railway operators to communicate and work closer in a way that is safer and more meaningful for railroad companies, governments and passengers.

TAKE AWAY

Iridium's SBD® technology is best suited to help railroad companies meet important regulatory standards and limit train collisions.

