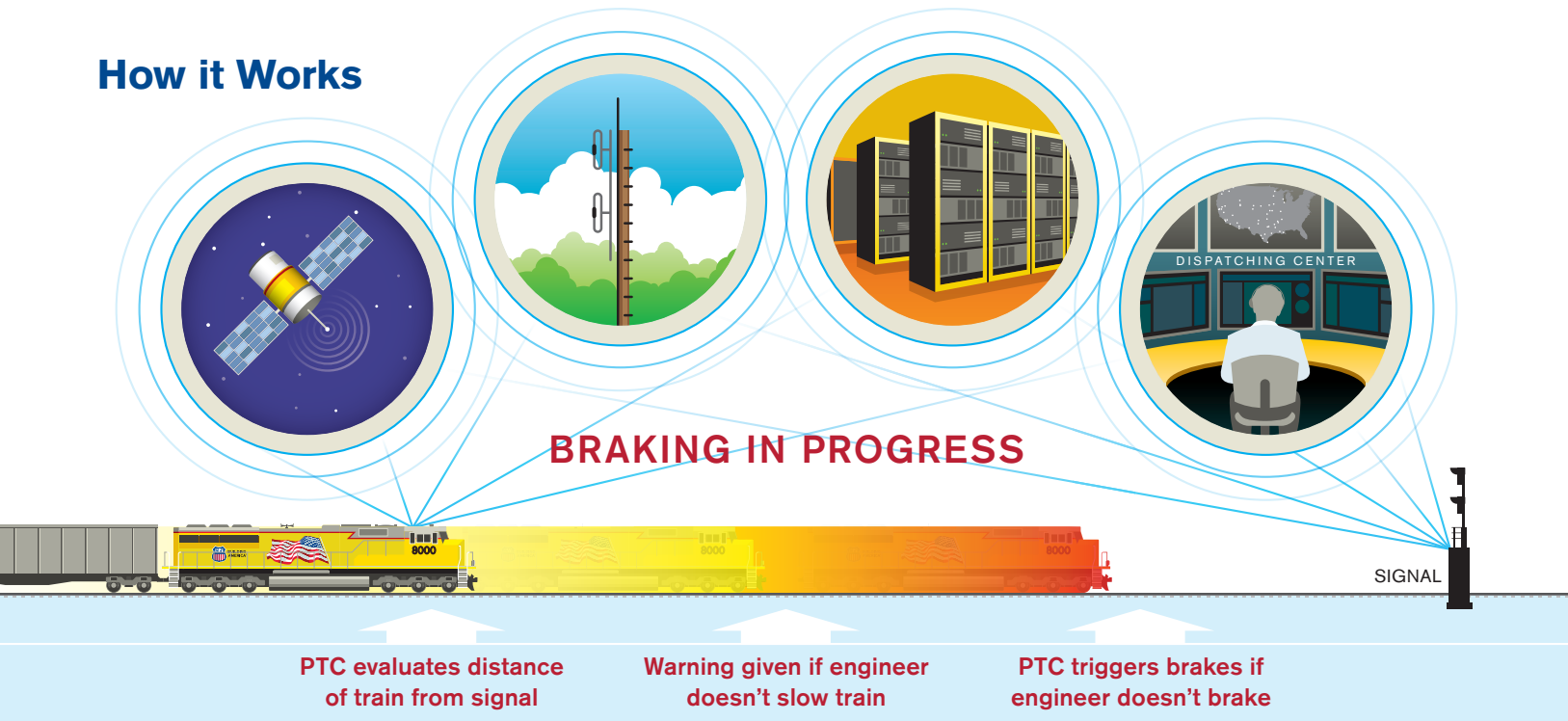


# UNION PACIFIC Positive Train Control



## How it Works



## Fast Facts

Union Pacific will invest: about **\$2.5 BILLION TO MAKE PTC OPERATIONAL**

Union Pacific will equip: **6,500+ LOCOMOTIVES** and more than **20,000 ROUTE MILES**

Union Pacific will install: more than **10,000 WAYSIDE ANTENNAS** and **6,500 LOCOMOTIVE RADIOS**

Union Pacific accounts for: about **A THIRD OF THE INDUSTRY'S RADIOS, LOCOMOTIVES AND ROUTE MILES** required to implement PTC


Union Pacific has hired: about **1,000 EMPLOYEES & CONTRACTORS** to work on PTC


## What it Does


PTC automatically stops a train before certain incidents occur, including train-to-train collisions, derailments caused by excessive train speed, unauthorized train entry into work zones or movements through misaligned track switches.


PTC will not prevent vehicle-train incidents at crossings, stop trains when pedestrians are on the tracks, or prevent incidents due to track or equipment malfunctions.

## Scope Challenges

 PTC is not an off-the-shelf technology. It is a complex, nationwide system comprised of multiple independent technologies – many of which did not exist when Congress mandated PTC.

 The PTC system requires integrating thousands of components across the telecommunications spectrum, such as GPS, Wi-Fi, radios, antennas, base stations and first-of-its-kind software that predicts when to slow or stop a train.

 PTC must be interoperable, meaning that passenger, commuter and freight trains are required to seamlessly communicate across all railroad systems.

 PTC's all-new software must continuously relay critical information such as speed limits, train movement authorization, switch positions, work zone locations and other operational data. It must factor in locomotive and rail car mix; train length, weight and speed; terrain and signal aspects to determine safe stopping distances.

# Passenger, TIH Rail Service Will Stop Without PTC Extension



In 2008, Congress mandated railroads to install Positive Train Control (PTC) on lines that carry passengers and/or toxic by inhalation gas (TIH), such as chlorine and anhydrous ammonia (fertilizer). The deadline for installation is Dec. 31, 2015.

While we work to help Congress and other stakeholders understand the need for a deadline extension, we are alerting customers of our plans to stop passenger service and TIH traffic on the Union Pacific network should Congress not act in time.

As of Jan. 1, 2016, without PTC fully installed, we would be operating in violation of federal law and could face millions of dollars in fines daily, as well as expose ourselves to untold liability should a TIH or passenger train accident occur on a line required to be equipped with PTC.

To ensure TIH shipments are not on our system as of Jan. 1, 2016, we expect to issue the TIH embargo notice prior to Thanksgiving. Commuter operations would cease before midnight Dec. 31, 2015, and origination of long-distance passenger trains will stop several days earlier to ensure all passengers reach destinations before the deadline.



Our decision was not made lightly or in haste. Union Pacific carefully reviewed its options, which are limited. Stopping passenger and TIH traffic, which is the traffic that necessitates PTC installation, is the most responsible option.

It's important to remember our network connects 23 states and serves many of the country's fastest-growing population centers, making Union Pacific a critical piece of the U.S. economy. With 10,000 customers across nearly every industry relying on Union Pacific to deliver products, this embargo will have wide reverberations across the country including the following:

No passenger or commuter rail service on Union Pacific lines in places such as the Bay Area, Chicago and Portland. Long-distance Amtrak trains will not operate on our lines.

Many cities rely on chlorine, a toxic inhalation hazard, to purify their drinking water and farmers rely on ammonia to fertilize their crops. Reduced or suspended train service will prevent Union Pacific from delivering these critical resources.

Rail is the safest way to transport hazardous chemicals. If service ceases, these chemicals will be forced to move by truck on our nation's highways. There will be an increased safety risk.