

# UNION PACIFIC'S THIRD QUARTER 2018 Positive Train Control Update



Union Pacific continues to make significant progress implementing positive train control (PTC). As allowed by federal law, Union Pacific will continue to implement, test and refine the complex suite of technologies comprising the system in 2019-20.

Union Pacific's required PTC footprint is the largest of all North American railroads, encompassing more than 17,000 route miles, roughly one-third of all PTC miles and 45 percent more required miles than the next largest railroad. Union Pacific is in regular contact with the Federal Railroad Administration officials regarding its PTC progress.

Installing and implementing PTC across the U.S. rail network, including passenger and freight, is costly and complex. One of the most challenging parts of PTC implementation is ensuring system interoperability among all U.S. rail lines and locomotives. Given the various readiness levels of North American freight and passenger railroads, including publicly funded commuter lines and short lines, it is important that all railroads continue working together to maintain the health, safety, resiliency and fluidity of the rail network during PTC implementation.

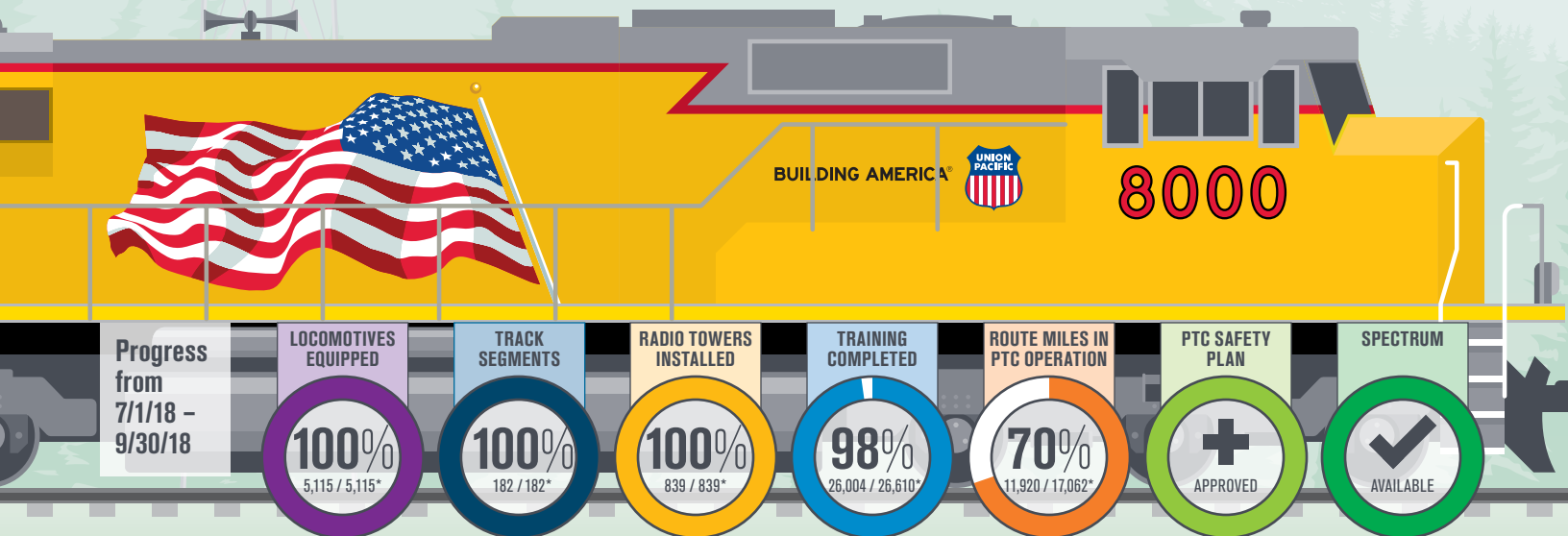
Union Pacific's third quarter 2018 accomplishments, between July 1 and September 30, included:

- **Preparing additional track segments for PTC operations**, bringing the total number of track segments to 182 or 100 percent complete, a slight increase from reported

segments in Union Pacific's August 2018 update. These track segments are equipped with wayside devices such as signals, switches and radios and have defined GPS coordinates, which identify thousands of precise locations for systemwide PTC coordination.

- **Educating 1,329 employees on PTC operations**, bringing the total number of employees trained to 26,004 or 98 percent. Training materials are tailored to a variety of employee roles, including engineer, conductor, dispatcher, maintenance of way/engineering, mechanical, signal, telecom and information technologies.
- **Increasing by approximately 393 the number of implemented PTC route miles**, bringing the total number of route miles in PTC operations to 11,920 or 70 percent. Union Pacific implemented these route miles in July, the beginning of the third quarter. Therefore, these same numbers were also stated in the August 2018 PTC Update.

Union Pacific is testing the PTC system while it is implemented across our network. Trains are experiencing fewer unintended stops, as technology improves and employees become more familiar with the system. A portion of unintended stops involve PTC-equipped trains from passenger and other freight railroads operating on Union Pacific rail lines. These unintended stops adversely impact Union Pacific's systemwide velocity. On occasion, customers and communities can experience train and vehicular traffic delays. Union Pacific is diligently working to eliminate unintended stops.



\*Union Pacific submitted to the FRA a request for amendment to its PTC Implementation Plan on August 17, 2018. This request modifies the total requirement counts for each of these metrics. The numbers shown here reflect these updates and may vary from the FRA's quarterly industry status reports.

With the FRA's conditional approval of our PTC safety plan on April 26, 2017, Union Pacific is running PTC operations on nearly 12,000 miles in Arizona, Arkansas, California, Colorado, Idaho, Illinois, Iowa, Louisiana, Minnesota, Missouri, Nebraska, Nevada, New Mexico, Oregon, Texas, Utah, Washington, Wisconsin and Wyoming.

### WHAT PTC DOES PREVENT:

- ✓ Train-to-train collisions
- ✓ Derailments caused by excessive train speed
- ✓ Train movements through misaligned track switches
- ✓ Unauthorized train entry into work zones

### WHAT PTC DOES NOT PREVENT:

- ✗ Vehicle-train accidents at railroad crossings
- ✗ Train accidents involving pedestrians on the track
- ✗ Incidents due to railroad track malfunction
- ✗ Incidents due to equipment malfunction

