

Electronically Controlled Pneumatic (ECP) Brakes

Key Takeaway: U.S. railroads have engaged in extensive real-world tests of ECP brakes and found that the failure rate of ECP systems is significant, and the repair time is much too long to make them practical.

Freight railroads safely move vast quantities of the products critical to our health and quality of life, including fertilizer, ethanol, crude oil and chlorine. Today, more than 99.9% of all hazmat moved by rail reaches its destination without a release caused by an incident. Railroads follow rigorous standards and operating procedures for hazmat movement and invest in equipment, infrastructure, technology, training and community safety efforts. Together, these efforts have reduced the hazmat accident rate by 75% since 2000 to its lowest-ever rate.

High Failure Rates

U.S. railroads have engaged in extensive real-world tests of ECP brakes and found that the failure rate of ECP systems is significant, and the repair time is much too long to make them practical. Worse, ECP-equipped trains that became unmovable due to ECP failures blocked the track for other trains and caused far-reaching disruptions. Instead, railroads have often used distributed power (locomotives placed strategically throughout a train) and end-of-train devices that allow the brake signal to reach all cars of a train more quickly than when a brake signal is sent only from the lead locomotive of a train.

No Meaningful Safety Benefit

In justifying its original ECP mandate, the U.S. Department of Transportation (USDOT) speculated that ECP brakes would reduce the severity of accidents by reducing the kinetic energy. MxV Rail (formerly The Transportation Technology Center, Inc. or TTCI), the world's premier rail research organization, analyzed this claim.

The researchers found that, on representative 100-car trains, ECP brakes would result, on average, in 1.2 to 1.6 fewer railcars derailing. In the case of tank cars, the probability of a significant (more than 100 gallons) release of hazmat from these 1.2 to 1.6 railcars is less than 5% for tank cars meeting the latest USDOT specifications.

Mandate Repealed After Independent Analysis

After USDOT released a final rule mandating the use of ECP on certain crude oil, ethanol and hazmat trains, the Fixing America's Surface Transportation Act required an evaluation of the USDOT ECP brake requirement to study the efficacy and costs of the ECP brake systems.

Additionally, an independent, evidence-based evaluation of ECP brake systems was unable to make conclusive findings on ECP emergency brake performance relative to other braking systems on the basis of the results provided by DOT's modeling of train derailment scenarios.

- An October 2017 National Academies of Sciences, Engineering, and Medicine (NAS) report found that the DOT's approach to mandating ECP brakes over other technologies was "incomplete and unconvincing."
- An October 2016 GAO study determined the DOT's justification for the ECP rule "lacked transparency" and was insufficient to enable third-party validation

In September 2018, the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Federal Railroad Administration (FRA) rescinded the ECP brake mandate because the [expected costs](#) of ECP brakes are significantly higher than the expected benefits.