Committee on Transportation and Infrastructure
Roundtable on Emerging Railroad Technologies
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Thank you for the opportunity to appear in this discussion about emerging technology in the railroad industry.

I hired out on the Burlington Northern Railroad in 1977 in the track department replacing ties. At that time we had 35-50 people on a tie gang and we would replace 800-1,200 railroad ties a day. My foreman, at the time, told me when he hired out, they replaced about the same number of ties a day, but they had 300 people working on a gang.

In the fall of 1978, I became a trainman and we had five people on the crew with a caboose and we operated coal trains with 100 steel cars and four locomotives and went 100 miles in a day. By 2009, when I last operated coal trains, the trains were 126 cars long, the cars are now aluminum and we only use three locomotives and travel more than 200 miles in a day with only two crew members.

There have been incredible advancements in technology and efficiency in the near 40 years I've been in the industry. There have also been tremendous improvements in safety due to technology and a change in safety culture and safety regulations.

In all that I've seen in my 40 years, the greatest safety improvement, bar none, is Electronically Controlled Pneumatic (ECP) train brakes.

Conventional air brakes have reached the end of the line in regards to advancements in safety. Conventional train air brakes are a 150-year old technology that have evolved from valves called AB, ABD to the now ABDW. Improvements to be sure, but these brakes are mechanical and are operated by air pressure and the limits to their improvements have been met.

The railroad industry, in arguing against the implementation of ECP brakes, have claimed that dynamic brakes and distributive power are the better choices.

Locomotive Dynamic braking is something we have been using since 1940 and this technology has also improved over the years and this brake system does help slow and stop trains.

Distributive power, where an engineer operates locomotives at the front and rear of the train, simultaneously helps a train brake by exhausting the brake pipe pressure from both ends of the train instead of only from the lead locomotive and supplies brake pipe pressure at both ends of the train which helps maintains air pressure. These features certainly help an engineer safely operate a train.

While distributive power and dynamic braking provide improvements to a train's braking ability, they too have reached the end of the line in terms of improving a train's braking effectiveness.

The way in which we take a great leap forward in rail safety and dramatically improve a train's braking effectiveness is with ECP brakes.

ECP brakes slow and stop trains up to 70% faster than conventional brake systems. The heavier the train the greater the ECP advantage over conventional brake systems.

ECP top 11 list (which by my count is better than 10!)

1. ECP brakes maintain a train's brake pipe pressure 100% of the time - conventional brakes do not. The colder the weather, the thinner the air, the more crucial maintaining brake pressure is.
2. ECP brakes allow for a "graduated release". That means the engineer can partially release the train's brakes without having to fully release them. This is vitally important because once a train's brakes are released it takes time to recharge the train's brake pipe pressure in order for the brakes to work again. The graduated release feature allows an engineer to maintain the speed of his train, down steep grades with a partial application of the brakes, without fully releasing and reapplying the trains brakes repeatedly. The graduated realse feature all but eliminates the possibility of a runaway train. Again, this is a very significant issue, especially in cold weather. Passenger trains do have the capability of a graduated release with conventional brakes because they are only a few cars long.
3. When the engineer makes an emergency application of the brakes every car with ECP brakes apply 100% of the time. This is not always true with conventional brakes.
4. ECP brakes would have prevented the Lac Magnetic oil train tragedy, a factor cited in Transport Canada's report on the accident. These brakes would have prevented the accident because when air pressure on a car equipped with ECP brakes drops below 50 psi the car automatically goes into emergency. So even an improperly secured train will not roll away.
5. ECP brakes allow the crew to monitor every car in the train in real time to determine if the brakes are applied or released. Conventional brakes don't.
6. ECP brakes record retrievable data associated with brake failures. There is no such review for conventional brakes. Trains are inspected every 1,000-1,800 miles and if the brakes are working during the inspection they continue on. If a car has brakes that fail to apply during that inspection, the car is taken to a repair facility. Often that facility is a heated shop where the car warms up, the brakes are tested and if they work at that point the car is not repaired and is put back in the train.
7. ECP brakes all but eliminate in train forces because all the cars apply and release at once. Conventional brakes cause lots of in train forces, some of which damage merchandise and even cause derailments.
8. ECP brakes cause all cars to brake evenly and dramatically reduce damage to wheels and brake shoes, saving a great deal of money in maintenance and repair. Conventional brakes do not. The modest costs of installing ECP brakes, about $3,000 a car on a new DOT 117 tank car that costs $144,00 to build and about $60,000 a locomotive, will be more than paid for in the savings in car repairs, let alone reduced train derailments.
9. ECP brakes can be modified to apply hand brakes to a railcar automatically from the locomotive, allowing the crew to apply a handbrake on every car in the train in seconds. Conventional brakes must be applied by hand and it can take an hour or more to properly secure a train.
10. ECP brakes are required by the AAR for the movement of nuclear waste trains because they are the safest brake system available.

11. ECP brakes can be modified and will evolve to do everything sophisticated wayside train detectors now do and will do it constantly in real time, eventually eliminating the need for wayside detectors.

RUNAWAY AND MAIN-TRACK DERAILMENT
MONTREAL, MAINE & ATLANTIC RAILWAY
FREIGHT TRAIN MMA-002 MILE 0.23, SHERBROOKE SUBDIVISION LAC-MÉGANTIC, QUEBEC 06 JULY 2013

Electronically controlled pneumatic (ECP) brakes—This braking system is an alternative to conventional air brakes. The system sends electrical signals to the cars, instantaneously applying the brakes (quick response braking); it does not rely on the flow of air from the locomotive to each car to activate the brakes. Information is also exchanged between the locomotives and each car. When the system senses that the brake pipe pressure has dropped below 50 psi, a "low brake pressure condition" message is initiated. This message results in all of the ECP-equipped cars and the ECP-equipped locomotives automatically applying their brakes in emergency.