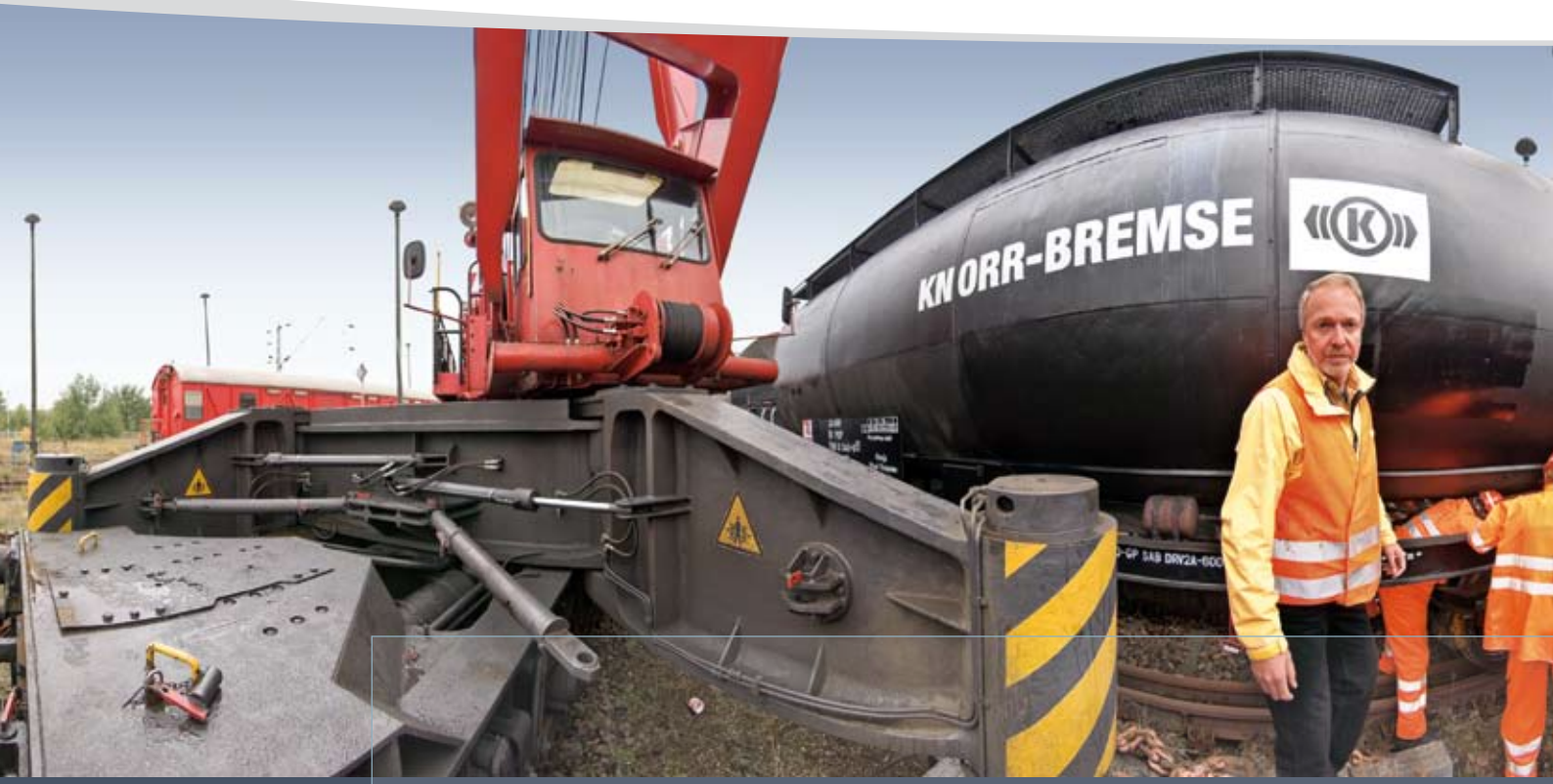
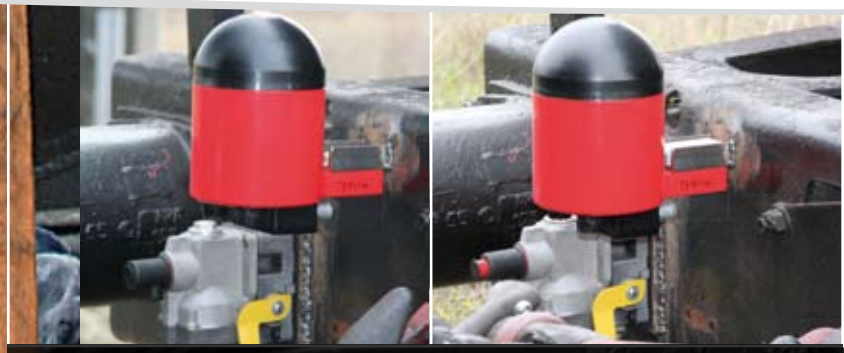


Reaction time: forty milliseconds

The tension mounts. Never before has a derailment test been carried out at a speed of 50 km/h.

On October 12, a fully-laden tank car in Berlin Schöneweide derailed at a speed of 50 kilometers per hour. The train came to a halt some 70 meters down the line – and was immediately surrounded by men in orange safety overalls. "Very good," commented Gerd Buchmeier, Chief Development Engineer at Swiss company Oerlikon-Knorr Eisenbahntechnik AG. "As we expected, the detector tripped after only 40 milliseconds." The water-filled tank car had been derailed as part of an elaborate field test aimed at assessing the newly-modified EDT101 derailment detector – the first step towards widespread introduction of a technology that can save lives and prevent millions of dollars worth of damage in the freight sector.

"To make things as difficult as possible for the detector, the car was derailed very gently," explains Gerd Buchmeier, Chief Development Engineer at Swiss company Oerlikon-Knorr Eisenbahntechnik AG.



Derailment detector in set and released modes.

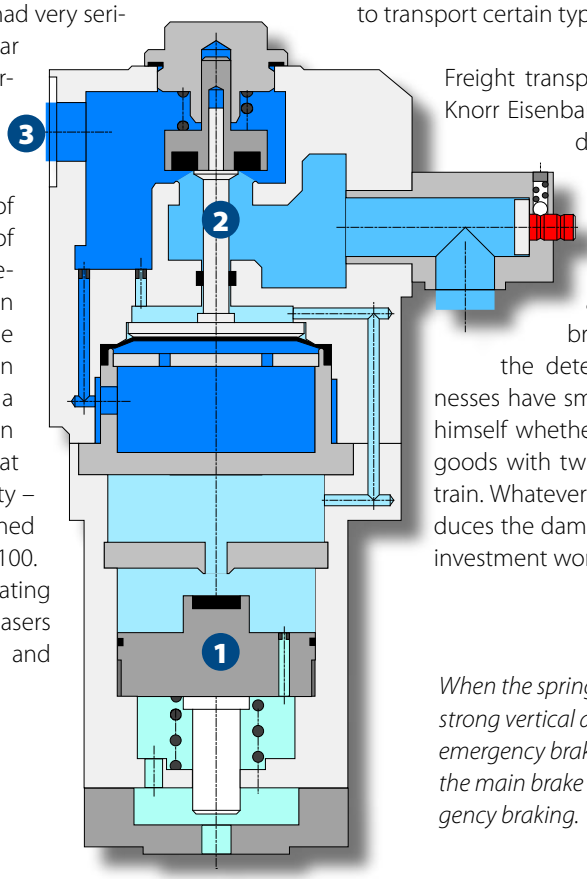
The car to be derailed was lifted onto a separate, parallel track (left), where it reached a speed of 50 km/h before ploughing into the ballast (right).

The detector has already prevented serious accidents in real-life situations. In 2006, for example, it brought a train with derailed cars to a halt before it had reached the next station. Without a detector, the derailment might have only come to the driver's attention when the car concerned tipped over – as happened in the same year, when a derailed car was dragged into the station in Mühlehorn/Switzerland and rolled onto the platform. Buchmeier still shudders at the memory. "It doesn't bear thinking what might have happened if there had been people standing there".

In 1994 an undetected derailment had very serious consequences when a tank car exploded in Zürich-Affoltern, triggering a fire that left three people seriously injured and caused millions of dollars worth of damage.
A one-off case? Well, no. "Four out of five accidents resulting in spillage of dangerous goods are caused by derailment", explains Buchmeier. "And in some 40 per cent of all cases the damage is caused because the train driver doesn't at first realize that a derailment has occurred". It was in the wake of the Zürich accident that the Swiss Federal Transport Authority – now SBB Cargo AG – commissioned Oerlikon-Knorr to develop the EDT100. The system has now been operating successfully since 1996, and purchasers include Rätische Bahnen, Wascosa and operators in Slovenia and Morocco.

But why – after so many years – was there a need for such an elaborate derailment test? "Since mid-2003 there had been a number of cases of false tripping of detectors under normal operating conditions," explains Buchmeier. "What we did was to raise the tripping threshold – and so far there have been no further cases. The tests have now shown that in real cases of derailment the modified EDT101 operates just as reliably as its predecessor." The door is now open to introduction of the system on an EU-wide basis, and the first steps have already been taken: As from 2011, derailment detectors will be compulsory on new tank cars and battery wagons used to transport certain types of dangerous goods In Europe.

Freight transporters follow the rules – and the Oerlikon Knorr Eisenbahntechnik EDT101 shows the company understands the market: Many freight cars are not equipped with electronic systems, so the retro-fittable detector functions mechanically. It is essential that a freight train should be stopped as soon as it derails, and the system ensures that full emergency braking occurs within a fraction of a second of the detector tripping. Freight transportation businesses have small margins, so the operator can decide for himself whether to fit only those cars carrying dangerous goods with twin EDT101 detectors or to equip the entire train. Whatever the final decision, the EDT considerably reduces the damage resulting from a derailment – so it is an investment worth making. ■



When the spring mass valve (1) detects strong vertical acceleration it activates the emergency brake valve (2), which opens the main brake pipe (3) and triggers emergency braking.