

**Press Release**

Munich, September 25, 2019

**Automatic train handling: Knorr-Bremse's NYAB subsidiary successfully trials self-operating capabilities of freight train**

- **LEADER® AutoPilot™, the on-board energy management system of Knorr-Bremse's New York Air Brake subsidiary, successfully operated a freight train from start to finish**
- **The system demonstrated automatic control of throttle, dynamic brake, independent brake and air brakes, contributing to lower fuel consumption and reduced in-train forces**
- **The test run highlights potentials for energy-efficient train operation**

**Munich, September 25, 2019 – New York Air Brake LLC (NYAB), a North American-based subsidiary of the Knorr-Bremse Group, the global market leader for braking systems and a leading supplier of other rail and commercial vehicle subsystems, deployed its on-board energy management system, LEADER® AutoPilot™, to test the automatic driving capabilities of a freight train in Colorado, USA, at the end of August. The system managed to automatically start, accelerate, brake, and stop a heavy-haul cargo train in different terrains, helping to cut fuel use and increase efficiency.**

Driving on a 48-mile test track and with locomotive engineers riding along, NYAB's LEADER® AutoPilot™ automatically operated three locomotives and 30 loaded wagons carrying 4,725 trailing tons. Solely under the command of a computer, the system managed to start and stop on uphill, downhill and flat grades. The test took place in a Positive Train Control (PTC) environment, a North America-only specification for train testing.

"LEADER AutoPilot commands all four freight-train control systems – throttle, dynamic brake, independent brake and air brakes – providing precise control that conserves fuel and reduces in-train forces," said Jason Connell, NYAB's Senior Vice President of Marketing, Sales, and Service. Deepak Kumar, Director of Marketing at NYAB added: "LEADER AutoPilot is an on-board digital platform designed for railroads to improve their operation and reduce their operating ratio."

The demonstration was performed at the Transportation Technology Center, Inc., in Pueblo, Colorado. LEADER AutoPilot uses track profiles, consist data including data on both the train's cars and locomotives, as well as GPS data to calculate the ideal driving strategy in real time, optimizing fuel consumption and velocity, as well as reducing in-train forces.

With the test, NYAB showcased that LEADER AutoPilot can also operate trains with pneumatically controlled air brakes, a technology that is predominantly used in North America. This way, the system can precisely execute the driving strategy of each railroad in the North American PTC environment. After LEADER® DriverAssist™ and LEADER® AutoControl™, LEADER AutoPilot is the system's latest and most advanced version. In fact, a major Australian mining company already uses LEADER AutoPilot to automatically operate an electronically controlled pneumatic brake (ECP) train over hundreds of miles in Australia.

Outside the US locomotive and heavy-haul freight market, the principal eco driving functions of LEADER have been integrated in the digital platform "iCOM", adapted for passenger and light freight operation. Using track profiles and timetable information, train consist data

including vehicle data, as well as GPS data and, before long, weather data as well, the “iCOM Assist” driver advisory system gives intelligent recommendations to the engineer to help reduce energy consumption and support on-time operation. The next step is to increasingly integrate traffic management functions and establish a non-safety-relevant interface with the automatic train protection (ATP) system, strategically moving towards supporting automated train operation in the long run.

**Caption 1:** LEADER® AutoPilot™, the on-board energy management system of Knorr-Bremse’s New York Air Brake subsidiary, automatically operated a freight train from start to finish. | © Knorr-Bremse

**Knorr-Bremse (ISIN: DE000KBX1006, ticker symbol: KBX)** is the global market leader for braking systems and a leading supplier of other safety-critical rail and commercial vehicle systems. Knorr-Bremse’s products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. Some 28,500 expert, dedicated employees at over 100 sites in more than 30 countries deliver products and services to satisfied customers worldwide. In 2018, Knorr-Bremse’s two divisions together generated global revenues of €6.6 billion. For more than 114 years, the Company has been at the cutting edge of its industries, driving innovation in mobility and transportation technologies with a leading edge in connected system solutions. One of Germany’s most successful industrial companies, Knorr-Bremse profits from the key global megatrends of urbanization, ecoefficiency, digitization and automated driving.

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