Press Release 19th May 2021

Digital Twin: BMVI subsidises trial project to digitally support the Wagon Technical Inspection

Bonn. In May 2021, RailWatch will start the "DigiTwin" project together with the Railway Undertaking METRANS Rail (Deutschland). This involves the development of an innovative measurement system, which can create the Digital Twin of a passing freight wagon. This Digital Twin helps to improve the train preparation and the maintenance of freight wagons. The BMVI is providing around 3.5 million Euro of funding for the project under the federal program "Zukunft Schienengüterverkehr".

The daily routine of a wagon inspector: A freight train with 25 wagons is waiting to leave the terminal. Before the journey can commence, a wagon inspector must walk along the entire 600-meter-long train and check for damages – wagon by wagon, in all kinds of weather. If a defect is found, the affected wagon must be shunted out of the train: a very time- and cost-intensive procedure.

Until now, the low level of automation and digitalisation in rail freight transport meant that these important processes had to proceed without digital assistance. A new trial project by RailWatch and the HHLA subsidiary METRANS has resolved that the future will look different. The technical condition of a complete freight wagon should be automatically detected, analysed and digitalised – all whilst the wagon passes the camera equipment. Not only Railway Undertakings will profit from this trial project, but also the wagon Keepers, who can use certain data to analyse the mechanical wear and to implement predictive maintenance.

„We look forward to implementing this project together with our cooperation partner METRANS Rail (Deutschland), to make rail freight more efficient, and more competitive in comparison to road freight", said Michael Breuer, Managing Partner of RailWatch. There is so far no comparable system which can digitally capture the complete technical condition of freight wagons to this extent, and thus enable an assessment against the conditions of the GCU (General Contract of Use for wagons).

For the trial project, which is scheduled to last two years and is receiving around 3.5 million Euro of funding under the BMVI federal program "Zukunft Schienengüterverkehr", RailWatch will increase its team to 60 employees. With a strong team of IT, sensor and railway specialists, the measurement system will be predominantly self-developed by RailWatch, and includes cameras, lighting, laser sensors, thermal sensors, and acoustic sensors. These record GCU-relevant areas such as wheel profiles, wheel flats, heat build-up, under-floor and side views, and loading gauge clearance. For each train passage, tens of thousands of pictures and a huge amount of sensor data are collected, to detect many different technical conditions. As part of the measurement system, an artificial intelligence-based software is being developed to fully-automatically record and analyse every relevant area, and create a "Digital Twin" of each individual wagon which passes through the station. 5G is already used for quick data transfer and processing in the cloud; this advanced technology supports the transfer of large quantities of required data.

“We are on the way to a digital future. This trial project enables us to support the digital transformation in rail freight transport and to reach the new level of Industry 4.0. Digitalised processes allow workflows to become easier, more exact, and more cost-efficient”, said Tobias Frede, CTO of RailWatch and Project Manager for DigiTwin.

The field tests being carried out with METRANS will provide proof of concept for the integration of the automatic wagon technical inspection into the Safety Management System of the Railway Undertaking. The tests will also assess the collected data against the technical rules and regulations.

“RailWatch has the necessary know-how in the areas of railway, technology and IT, to successfully implement this innovative project. We are looking forward to the first stationary test sites and the assessment and validation of the findings”, said Holger Westphal, Rail Operations Manager for METRANS.

About METRANS Rail (Deutschland) GmbH

METRANS Rail (Deutschland), a Railway Undertaking for the provision of rail transport services, is a 100% subsidiary of the Czech company METRANS a.s. The intermodal company METRANS belongs to the European logistics company Hamburger Hafen und Logistik AG (HHLA).

About RailWatch GmbH

RailWatch is a data company founded in 2015 and based in Bonn. To make rail freight transport more efficient, more cost-efficient and safer, the company builds measuring stations next to railway lines, which scan trains during their passage. Using highly sensitive sensors and AI processes, the technical condition of freight wagons is recorded, documented, and presented to customers in a user-friendly form via a web portal.

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