Track Maintenance & Construction: Still in Search of It’s Place in the 4.0 World

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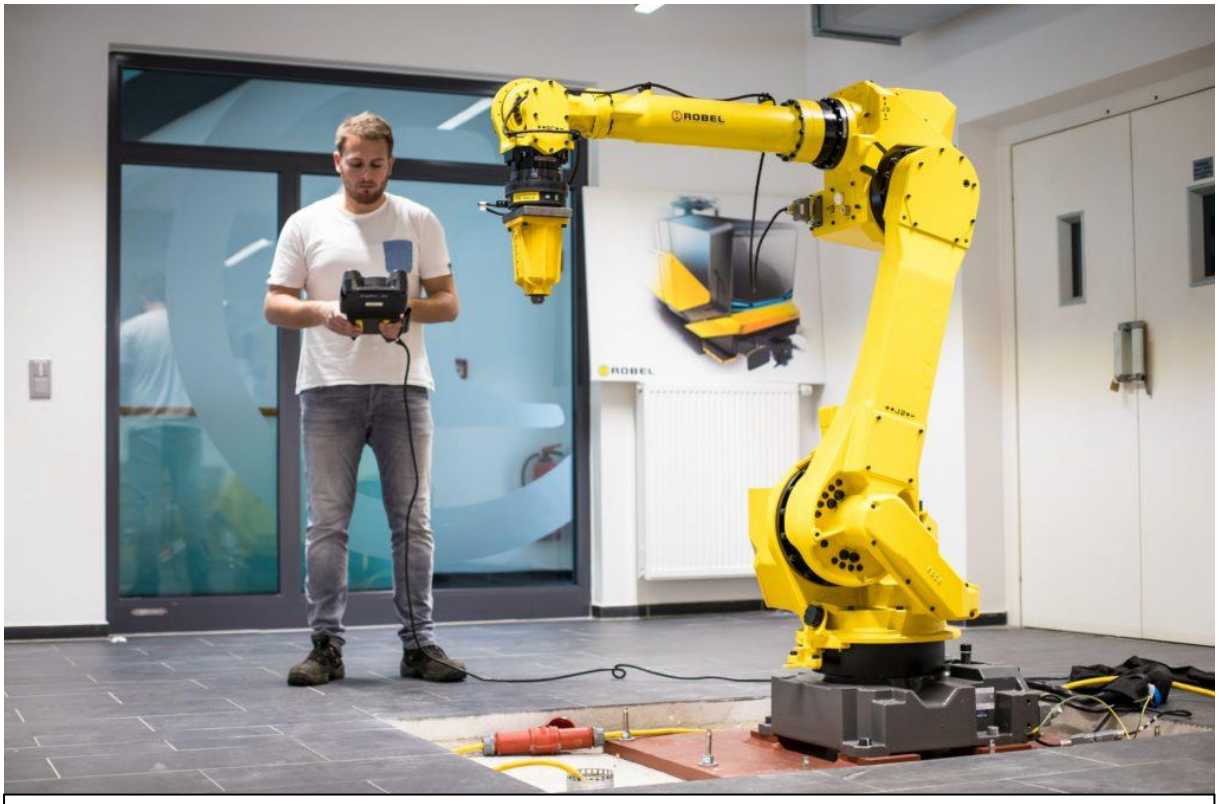
Supplier News

On the 17th September 2018 the World Economic Forum made the prediction that *“Machines will do more tasks than Humans by 2025…”*. According to this report, within the next 6 years, 52% of all working hours will be done by robots. As a result, productivity in the affected industries has the potential to increase significantly.



First laboratory tests of a track construction robot in the newly established Robel Technology Center in Freilassing, Germany © ROBEL Bahnbaumaschinen GmbH

Despite the predictions, little of this revolution can be detected in the railway sector. A pioneer of the Industrial Revolution, the railway industry now languishes behind many other sectors. There are applications of robotics in the field of bogie manufacture and wagon frame welding and initial experiments in the assembly of train components. In the maintenance of trains, attempts are under way to mechanise the process of waste water drainage with robots and also automate paint removal and cleaning processes. It is only in the field of train traffic control and operations that there has there been any serious and coordinated research and development into automated solutions.

Compared to the automotive industry, where robots have been in use for many years, to handle, drill, weld, cut and fasten, in the processes of construction, the railway sector has considerable catching up to do.

In track construction and infrastructure maintenance, virtually no robots are used. There are initial attempts in Japan to automate the cleaning of train stations. There are also larger track construction systems that are mechanised and digitised, although they still require a high level of manual set up, intervention and control. But in regards to spot track maintenance, work process are still almost entirely undertaken with hand guided machines.

The Challenge: Manpower Shortage and Reduction in Track Access Time

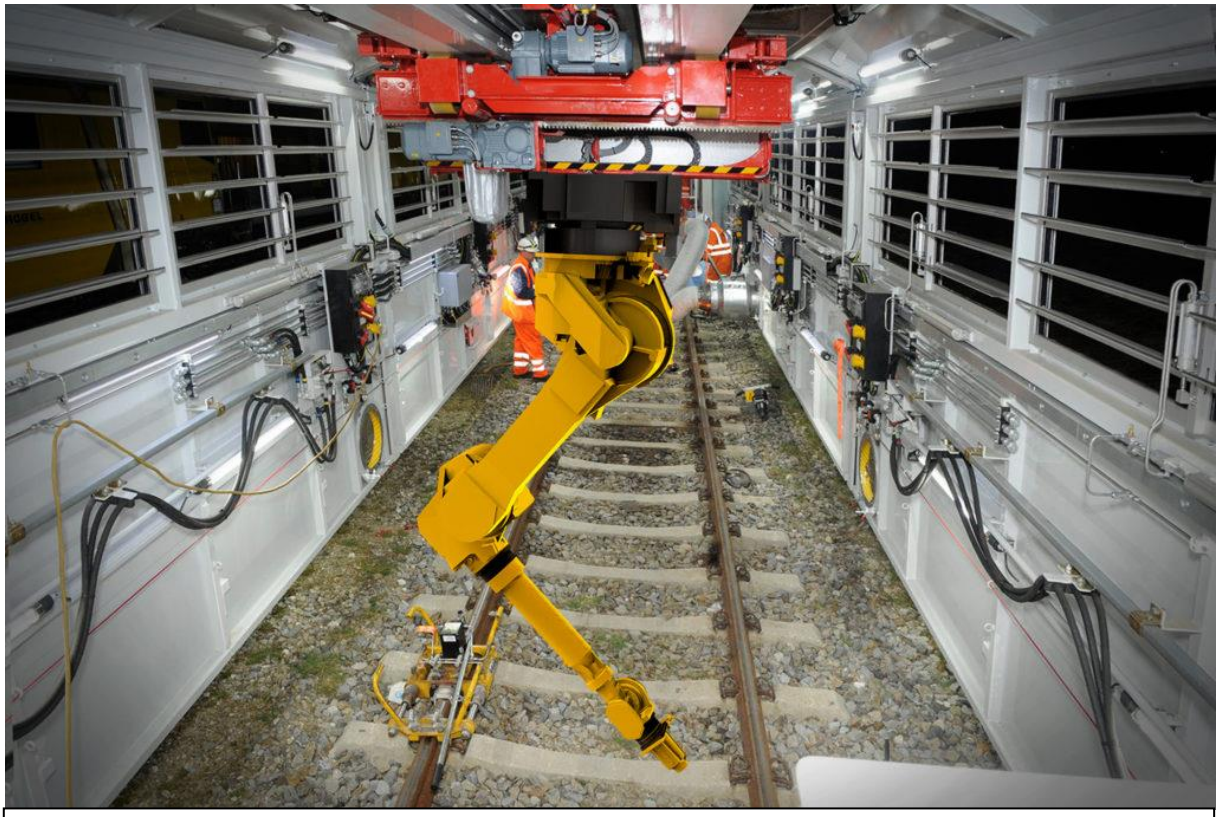
The industry faces two major challenges in the next decade. Firstly, a demographic change, especially in Europe and Japan, is starting to lead to a significant workforce shortage. Network operators predict that up to 50% of track maintenance staff will retire over the next eight years. Recruitment is proving increasingly difficult: Fewer and fewer people want to work on the railway infrastructure, in potentially dangerous conditions, all hours of the day and night, in all weathers and at unsocial times over a weekend and at public holidays.

The second factor is one of diminishing track access time to do maintenance work. With greater demand to run more passenger and freight services the inevitable result is shorter possession times. The challenge therefore is to deliver fast, efficient and reliable maintenance work with as little manual intervention as possible.

The Robel Solution: Robotics in Track Maintenance

In order to meet this challenge, the subject of robotics, automation and digitisation is now very much on the agenda for many railway operators. Solutions are now actively being sought and innovative ideas are being promoted. Already well established as a specialist in the design and construction of railway maintenance equipment, Robel is ready to take the next step and use their expertise to develop fully robotic and automated track maintenance solutions.

To reflect the importance in this strategic decision, Robel have now created a new Robotics Technology Centre: In this new facility at the Freilassing site, a team of young engineers is researching the possibilities of automating a host of manual maintenance activities. Building on their experience on delivering in the field of hand guided machinery, systems and vehicles Robel will develop customer oriented robotic solutions for the next generation of track maintenance.



A glimpse into the future: Study showing the application of a track construction robot in the Robel Mobile Maintenanance Unit © ROBEL Bahnbaumaschinen GmbH

The ultimate goal is to develop an autonomous mobile maintenance vehicle with fully integrated robotic track maintenance machines capable of delivering a range of standard track maintenance tasks from changing fastenings to rail defect replacement. Full automation will guarantee 100% safety as well as a fast, reliable and cost efficient maintenance solution.

It is Robel‘s firm belief, that by innovating and embracing 4.0 world technology, they can positively contribute and support the rail industry, strengthen competitiveness vis-à-vis road and air travel.

A demonstration of the first laboratory applications for robotics in railway track maintenance are to be presented at Robel‘s in-house exhibition, 17th to 19th September 2019, at their technical centre in Freilassing, Germany. If you are interested in attending please visit the Robel website www.robel.com for further details.

Innovation Partners Wanted

Do you want to be involved in the creation of new solutions at Robel’s Robotics Technology Centre and help to deliver customer orientated solutions for the next generation of track construction machines?

Robel wish to cooperate with innovative partners from the scientific community and the railway sector to develop new working procedures and realise the value 4.0 technology can add to track maintenance. Interested parties are asked to contact the author: Gregor.Schmid@robel.com