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GERMANY'S PORT STRATEGY

PORTS – GATES TO THE WORLD

+++ COUNTRY REPORT EUROPE 🇩🇪 DENMARK AND 🇬🇧 GREAT BRITAIN +++ Events: Silk Road Summit Vienna, Scandinavian Rail Optimisation, Stockholm +++ Contributions: Stefanie Carle, Dr. Martin Link, Kai Vergin Siemens Mobility +++ Sven Schallach HSL +++ Dr. Jürgen Murach VDEI +++ Olaf Scholtz-Knobloch UEEIV +++ Interviews: Dr. Karl-Peter Thelen Onyx Power Group +++ Łukasz Boroń Cargounit +++ Anett Holz, Frank Lau Krüger GmbH +++ Jure Mikolčić, Steffen Obst Stadler Germany +++ Stefan Kirch NEVOMO +++ Dipl.-Ing. Jutta Heine-Seela DB InfraGo +++ Andreas Pfeffer, Georg Herb, ToZero +++ Maciej Grześkowiak PESA +++



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EDITORIAL



Credits: HMV

Dear readers!

Our magazine deals with all forms of freight transport, the maritime industry is of course one of them. That's why it's an important issue for us that, after seemingly endless debates in Germany, the "National Port Strategy" has finally been adopted. Ports are the gates to the world. How does Germany want to "oil" its ports so that they are wide open? This is a major theme in this issue.

Ports are also playing an increasingly important role in the hydrogen strategy. We discuss this with an expert from **Onyx Power Group** using the example of the German port of Wilhelmshaven. We also discuss what challenges German ports are currently facing and how they want to prepare themselves for the future.

An important construction site is currently connecting the south of Denmark and the north of Germany. From 2029, the combined rail/road **Femernbelt Tunnel** will connect both countries under the Baltic Sea – a milestone for the growing together of Europe and also for fast and safe freight transport. Reason enough to dedicate a country report to **Denmark**.

The Polish company **Nevomo** is planning nothing less than a revolution on rails. A magnetic levitation system should make it possible to achieve significantly higher travel speeds on existing conventional railway lines. We are pleased to announce that we have been able to settle a cooperation agreement with the **Union of European Railway Engineers' Associations UEEIV**. We would like to support the important work of this Union and its member associations.

And it starts immediately: The UEEIV President who is also member of the **German Railway Engineers Association VDEI**, Olaf Scholtz-Knobloch, interviews one of the founders of Nevomo in this issue.

We wish you stimulating reading!

Hermann Schmidtendorf, editor-in-chief and publisher

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Credits: HHM Peter Glaubitt / Graphic design: Britta Ruge



Digital workshops have great advantages.

Credits: Siemens Mobility

NEWS

Credits: Hapag-Lloyd



HAPAG-LLOYD

The major Hamburg shipping company Hapag-Lloyd actually wanted to maintain its long-standing membership in the shipping

alliance “THE Alliance” until 2030. However, in mid-January 2024, the Hapag CEO announced the end of this partnership at the end of January 2025. After that, Hapag wants to enter into an alliance called “Gemini Cooperation” with the Danish competitor Maersk. Alliances of this type serve the purpose of agreeing on shipping routes and port calls. Price agreements are prohibited.

At the end of January 2024, Hapag-Lloyd reported a significant decline in earnings in its preliminary business figures for 2023. The turnover of the container shipping company almost halved compared to the previous year to 17.9 billion euros. Earnings before interest and taxes (EBIT) were only 2.5 billion euros, a seventh of the previous year’s value of 17.5 billion euros. In 2021 and 2022, container shipping companies made record profits worldwide due to the corona pandemic. In the past financial year, however, business returned to normal.

Hapag-Lloyd is the fifth largest container shipping company in the world with 264 ships, and Maersk is number two with 730 ships. Not all of the two partners’ fleets will be included in the new alliance. According to a statement, the new cooperation will include a pool of around 290 ships with a combined capacity of 3.4 million standard containers (TEU). Maersk will contribute 60 percent of the capacity, Hapag-Lloyd the remaining 40 percent.

hp/t/hfs

MSC: FREIGHT CAR PRODUCTION IN TRIESTE

Credits: Medlog



Mid February 2024, the global leader in shipping and logistics MSC – Mediterranean Shipping Company – announced its plans to take over

the Wärtsilä factory in Bagnoli della Rosandra, Trieste. By saving this former marine engines factory, MSC declares to enter the railway wagon manufacturing industry.

The information service railmarket.com points out that the acquisition, “strikingly made for the symbolic price of 1 euro”, comes with a commitment from MSC to not only rehire all 300 employees affected by the closure of the Finnish multinational’s plant but also to expand its workforce through new hires.

This move means a strategic expansion of MSC’s operational capabilities. MSC intends to manufacture in Trieste its own railway wagons, specifically designed for container transport. MSC is already present in railway transportation through its subsidiaries Medway and Medlog. MSC is also investing in the Ligurian region in port facilities and is engaged in the potential privatisation of the Christopher Columbus airport.

rm/hfs

COALITION AGAINST FALSE AIRCRAFT PARTS



Credits: CFM International

On February 23, 2024, aircraft manufacturers and engine suppliers as well as other representatives of the aerospace industry founded a joint organisation to prevent the installation of unauthorised parts in aircraft. The founding partners of the Aviation Supply Chain Integrity Coalition are Airbus and Boeing as well as the CFM International partners Safran and GE Aerospace. Delta Air Lines Inc., American Airlines Group Inc. and United Airlines Holdings Inc. are also included.

The new alliance represents the industry’s most direct response yet to the parts scandal, which recently provoked shock waves throughout the air flight industry. AOG Technics Ltd., a little known UK distributor of spare aircraft parts, was accused of selling thousands of components backed by forged documentation, prompting a global race by airlines to track down suspect parts.

In December, the UK’s top fraud authorities raided the home of the AOG director at the centre of the scandal and arrested him. In August 2023, the European Aviation Safety Agency said AOG Technics had sold parts accompanied by falsified Authorized Release Certificates (ARCs). The manufacturer CFM in particular has been affected by the controversy, the manufacturer having identified dozens of CFM56 engines as containing suspect parts obtained through AOG Technics. The CFM56 is a popular power plant, fitted to older-generation Boeing 737 and Airbus A320-family jets.

“While an extensive review found that less than 1% of CFM engines were affected – and most parts involved were non-serialised items like bolts, washers and bushings – the coalition will take a broader look at preventing future similar actions,” the manufacturer says. The response comes as demand for aircraft components and engine parts is soaring, particularly for those used on older Boeing 737 and Airbus A320 jets, as the plane makers struggle to lift production of the latest models to pre-pandemic levels.

fg/av/aj/hfs

NEWS/EUROPE'S FREIGHT RAILWAYS BECOME PRIVATE

FRET SNCF:

ONLY THE “BAD RAIL” REMAINS WITH THE STATE

The French state-owned rail freight company Fret SNCF is in the process of handing over all commercially interesting transport contracts to its competitors. The dismantling of the once leading French freight transport company Fret SNCF is being carried out under the euphemistic term “discontinuity plan”.

After a restructuring phase until July 2024, the formal establishment of a new company “New Fret” is scheduled to take place on January 1, 2025. This freight company has to take over “capacity management”, i.e. the trains with “isolated wagons” of different customers – in short, single-wagon traffic. These low-profit activities account for 80 percent of turnover and 70 percent of Fret SNCF traffic. Another company, New Maintenance, has to take care of rolling stock maintenance. **To put it bluntly: only the “bad bank” on rails remains with the state.**

These companies, together with the other subsidiaries Captrain, Naviland Cargo, VIIA and Forwardis, will be integrated into the rail freight division of the SNCF Group, Rail Logistics Europe. Around 3,900 employees at Fret SNCF are to be automatically transferred to New Fret and 500 to New Maintenance. The professional future of around 450 to 480 employees who work in “dedicated trains”, i.e. block trains, remains to be clarified. The profitable block train traffic is to be completely taken over by competing companies – if they want it, with the existing SNCF employees. But this perspective is fueling fears of reclassifications with potentially lower salaries than now.

The drama is the result of controversial State decisions. The rail freight transport market in France has been open to competition since 2006. An investigation has been ongoing in Brussels since the beginning of 2023 into alleged illegal aid from which



Compilation of a composition of freight wagons at the Valence marshalling yard: Only the single wagon traffic as shown here should remain with the “new” Fret.

Fret SNCF benefited between 2007 and 2019. In particular, it is about canceling their debts amounting to 5.3 billion euros. When the company was founded at the beginning of 2020 as part of the last railway reform, these were integrated into the debts of the SNCF group holding company. The EU considers this debt relief to be illegal and could demand the money back from Fret SNCF. The French Transport Minister Clément Beaune defended the previous policy by pointing to the EU's climate protection goal. However, Beaune shied away from a legal showdown with the EU and proposed the voluntary liquidation of the Fret SNCF freight division.

A new company should be founded with a different name, but still controlled by SNCF. The financing round could also include a minority shareholder. According to Matthias Emmerich, former deputy general manager of SNCF's freight division, a key reason for the poor situation of SNCF freight transport was its legal status until the 2020 reform as a “Public industrial and commercial company (EPIC)”. Emmerich is certain that Fret SNCF has made massive improvements and investments on its own in recent years. The company should not be blamed for bad political decisions. *hfs*

Credits: Hermann Schmidendorf

NEWS/EUROPE'S FREIGHT RAILWAYS BECOME PRIVATE

SPAIN:

HALF OF RENFE MERCANCÍAS FOR MSC

The freight transport subsidiary of the Spanish state railway, Renfe Mercancías, is also struggling with debts. The addition of a financially strong partner is intended to make the company fit for the future again. Over 30 companies responded, including the shipping companies Maersk and CMA CGM. In September 2023, the Renfe board of directors chose the shipping company MSC as a strategic partner. For this purpose, the MSC logistics provider Medlog and the Portugal-based MSC railway company Medway are to be involved. The deal still needs to be approved by the Spanish Council of Ministers.

On March 13, 2024, Renfe President Raúl Blanco stated that details were still being negotiated – such as the question of whether the shareholding would be 50:50 or whether the public operator would ultimately hold 51% of the capital, as Transport Minister Óscar Puente suggested. In any case, Renfe Mercancías will remain a 100% owned company by Renfe Operadora. In Spain, only 4% of freight transport is carried out by rail (EU average 17%), reported the German Chamber of Commerce for Spain AHK at the beginning of April 2024. The government is now focusing on a consistent expansion of rail freight transport through high infrastructure investments to connect the ports – but this is only possible with private partners.

Since 2011, Renfe Mercancías has accumulated losses of more than 400 million euros. In 2022 the loss was 38.4 million euros with sales of 231.7 million euros. According to “El País”, Renfe's share of the Spanish rail freight transport market is 52.8 percent. This is followed by Captrain (17.1 percent), the CMA CGM subsidiary Continental Rail (11.2 percent) and the DB

subsidiary Transfesa (7.4 percent). The president of Medway, Carlos Vasconcelos, is pushing the pace in the government negotiations: “If we can't take the train to a good port or train station, we'll continue on our own. Medway, with or without Renfe, will be the largest freight operator on the Iberian Peninsula.” To support the financing of the alliance with Renfe Mercancías, Medway sold 5% of the share capital to its employees. Train drivers are offered the option of either joining the alliance or continuing with Renfe.

The shipping company MSC is a global leader in sea transport, logistics and container transport. The new company aims to include rail services in the maritime hinterland itself in a complete logistics chain provided by the MSC Group companies. Medway plans to operate from the Iberian Peninsula through France to Northern Europe, reaching where Iberian exports go and where many imports come from. Renfe Mercancías boss Raúl Blanco hopes to have renewed his rolling stock by 2026. The fragmentation of locomotives to currently over 50 series should be reduced. The fleet should be newer, more homogeneous and equipped with the latest technology. *hfs*



Credits: Renfe-Mercancías



The port of Rotterdam continues to grow – here on the construction site Kop van de Beer.

Credits: Port of Rotterdam Authority/Danny

Port of Rotterdam:

“REMAIN AS RELEVANT AS TODAY, BUT **CLIMATE-NEUTRAL!**”

Rotterdam, Europe’s largest port, is located in the Rhine-Meuse Delta and employs around 385,000 people. The reasons for the port’s success are its geographical location at the mouth of the Rhine and on the North Sea. **The port can also be used by ships with a draft of 24 metres** – an important competitive advantage compared to the port in third place in the European ranking of Hamburg, where the deepening of the Elbe is intended to ensure navigability for ships with a draft of up to 14 metres. In second place, the combined Belgian ports of Antwerp and Zeebrugge also offer attractive con-

ditions. This is reflected in the current sales figures: Rotterdam increased container volumes by around 24 percent between 2007 and 2023, and Antwerp by around 22 percent.

As the leader among Europe’s ports, the Port of Rotterdam wants to set a good example. That is why **the port administration is formulating political and economic “key points for Europe”** with healthy self-confidence before the 2024 elections to the European Parliament – also on behalf of the other ports. It underlines the “importance of European cooperation” and emphasises: “Rotterdam wants ►



Rotterdam wants to be Europe’s port for all hydrogen carriers, such as ammonia, liquid organic hydrogen carriers (LOHC) and liquid hydrogen.

to remain as relevant to Europe as it is today, but in a climate-neutral form.”

PORT OF ROTTERDAM | KEY POINTS FOR EUROPE

The port of Rotterdam connects Europe to the world. Over thirty percent of container imports and exports for North-West Europe are transported via the port of Rotterdam. In addition, twelve percent of the energy demand in the European Union arrives at the port. This makes Rotterdam a major energy port. The challenges facing Europe are the same challenges that affect the port. The difficult geopolitical

situation, the energy and raw materials transition, future-proofing the supply chain, and finally innovation and digitalisation. The Port of Rotterdam Authority wants to tackle these issues in collaboration with businesses in the port, but is also seeking the partnership and support of the European Commission, the European Parliament and national authorities.

Collaboration is the key to success, this also applies to all the challenges the port faces:

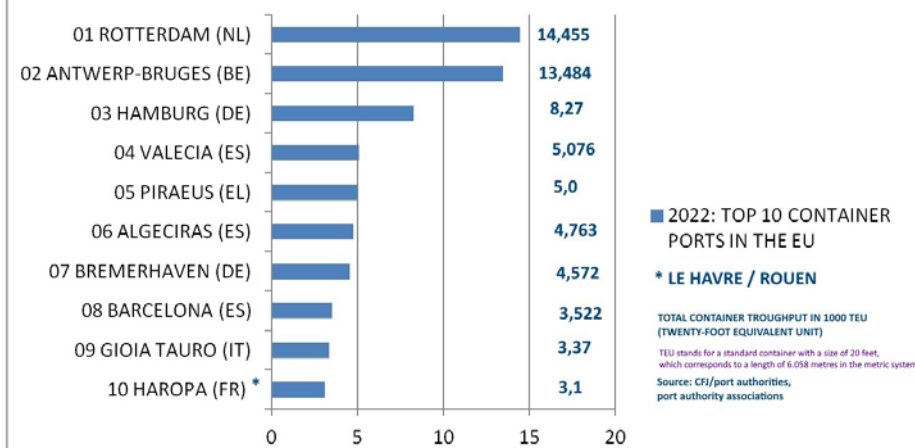
1. **The port** as part of a globally connected system in which Europe finds its new position in the ►

changing geopolitical situation while maintaining a healthy investment climate. European industry **desperately needs a stimulating industrial policy.**

2. **The port as a transition accelerator for Europe in the energy and raw materials transition.** To achieve the climate targets, full priority must be given to ensuring a smooth implementation of sustainability projects in the coming years.

3. **The port as a logistics hub** for Europe where transport is becoming increasingly more sustainable. There needs to be a sustained focus on investments in robust infrastructure in the freight corridors.

2022: TOP 10 CONTAINER PORTS IN THE EU



4. **The port as a smart partner for innovation through a process of digitalisation**, which supports us in responding to Europe's various challenges. This is also a crucial factor in maintaining security and tackling organised crime. hfs

FACTS AND FIGURES

Around 90 percent of world trade occurs by sea. A third of global ship movements have a destination or departure port in the European Union. According to UNCTAD, the world merchant fleet consisted of a total of 53,005 ships in July 2009.

At the end of 2023, the German merchant fleet consisted of a total of 1,800 ships (previous year 1,839 ships) with a gross tonnage (GT) of 47 million (previous year 44.8 million GT). This means that Germany remains the seventh largest shipping nation in the world. Greece, China and Japan occupy the top three places in that order. **When it comes to container shipping, Germany continues to be the leader (29 million GT), ahead of China (28.1 million GT).** This was reported by President Gaby Bornheim and Managing Director Martin Kröger of the Association of German Shipowners (VDR) on March 12, 2024.

According to the German Federal Ministry for Economic Affairs and Climate Protection (BMWK), the global container ship fleet grew to 5,360 container ships in 2020 (2018: 5,286 ships). According to Statista, in 2023 there were even more, namely 5,823 ships. The new ships coming onto the market are predominantly very large container ships, whereas it is mainly smaller units that are being scrapped.

The largest container ship shipping companies – as of June 2023 – are the Swiss Mediterranean (MSC), the Danish Maersk and the French CMA CGM Group, each with over 600 owned and leased ships. In the world ranking of the trading ports with the highest throughput, Shanghai (China) and Singapore occupy the first two places. The other positions up to 9th place are also occupied by Chinese ports, interrupted by the port of Busan (South Korea, 7th place). **The first European port on the ranking list is Rotterdam in 10th place.** The Dutch port metropolis handles around a third of Shanghai's throughput annually. hfs

AMMUNITION CLEARANCE IN THE NORTH AND BALTIC SEAS

Also on the Baltic Sea there are successful ports. The Polish port of Gdańsk **DCT Gdańsk container terminal** – at present called **Baltic Hub** – was only opened in 2007 and handled more than 2 million TEU in 2023. It is continuing to expand its capacities. However, the Baltic Sea and North Sea have been polluted for decades by ammunition from World War times lying on the seabed. The German federal government has therefore launched the immediate program "Ammunition contaminated sites in the North and Baltic Seas 2023-2025". Its aim is to create the conditions for systematic entry into the industrial disposal of contaminated sites in German maritime areas. In German waters alone there are an estimated 1.6 million tonnes that pose a danger to the population and the environment.

Seascope GmbH coordinates the immediate program on behalf of the responsible German Federal

Ministry. The **Society for Maritime Technology e.V. (GMT)** and the **Monitoring Network e.V. (SMN)** are involved. The pilot project for clearing munitions dumping areas is intended to lead to the development of a mobile floating disposal facility. Further innovative solutions should enable scaling and increased performance in the overall process. The aspects of recovery, processing and disposal, data management and the potential for the global market are also important. Finally, there are also ammunition in other port and sea areas that need to be cleared. hfs



Characteristic of harbour areas: the anchor buoys.

Credits: T. Friedrich CC BY 2.5

REFORM OF THE GERMAN IMPORT SALES TAX

Some of the competitive disadvantages of German ports in relation to neighbouring EU countries are self-inflicted. After years of debate, on April 11, 2024, Germany's finance ministers finally decided to simplify the procedure for collecting import sales tax. Up to now, **importers in Germany's ports have first had to pay import sales tax to customs.** This money will later be refunded to companies upon request as part of their tax return. This means high administrative effort and tying up of liquidity. The introduction of a "deadline model" in 2020 was only of limited help. This means that this sales tax only has to be paid on the 26th day of the second following month.

In other EU countries, however, the "billing model" applies. Importers do not have to pay any import taxes at all. You simply declare the import in your advance sales tax return and deduct the import tax due

as input tax in the same procedure. No money is flowing. That's why some companies prefer the ports in the Netherlands and Belgium when importing large quantities because it makes sense for them from a tax perspective.

Why hasn't the same tax procedure existed in Germany as in other EU countries? The interest group "The German Transport Forum" has been calling for this for a long time: "It only requires the conversion of IT and administrative procedures between the federal and state governments." Unlike elsewhere in the EU, not only central state authorities are responsible for tax issues, but also federal state ministries. Laws must therefore be adapted and the IT systems of the federal states must be harmonised with those of the central ministry. It doesn't help to complain – the German authorities have to carry out these household chores on their own. hfs

Onyx Power: “Wilhelmshaven has unique selling points for hydrogen”

CARGO FREIGHT JOURNAL: Dr. Thelen, you represent the Onyx Power Group and are well informed about the port in Wilhelmshaven, which now also focuses on energy. What is the Onyx Group and what do you do in connection with the port?

Dr. Karl-Peter Thelen: Onyx Power was created in 2019 from the carve out of the Engie Group's power plants in the Netherlands and Germany. We operate a total of around 2.5 GW of power plant capacity, including a brand new coal-fired power plant with 700 MW in Wilhelmshaven. But that is only part of the activities. In Wilhelmshaven, that was your question, we are also planning to set up an electrolysis facility in various steps, if possible the first step by the end of 2027, in accordance with the so-called Delegated Acts (DAs) of the European Commission. This is the part that the Onyx Group does.

We don't have ready markets for everything we need. Buying what's available on the market, buying electricity, buying electrolysis and putting it on the market doesn't work that way. In principle, you need an integrated view of all parts of the value chain. So

you have to see that you have the electricity on board, that you have the electrolysis on board and also the customer, and it all has to fit together. That is the big challenge. But this is the same for everyone who has a project of some kind in Wilhelmshaven.

And that's where I come to the Energy Hub. The Energy Hub was created in 2020 as a private initiative by companies. The companies had applied for various projects to the European Commission, all of which were unsuccessful, and asked themselves, why is that? They found what I just said, that the integrated view of the value chain had not taken place. Everyone had a very nice project, but only that – and didn't look ahead and back. That's why the projects were not accepted in the tender.

How did you respond to this situation?

Then we said: Okay, we can change that, we have to take it into our own hands. We then commissioned the German Energy Agency DENA with 15 companies to inventory the projects and, in particular, to

Dr. Karl-Peter Thelen (to the right) with CFJ editor-in-chief Hermann Schmidtendorf. The graduate economist (Rheinische Friedrich-Wilhelms-Universität Bonn) Dr. Karl-Peter Thelen has been responsible for Regulatory Affairs/Public Affairs at Onyx Power Group since 2021. Before that, he worked at Siemens, E.ON and Engie.



Credits: CFJ



A central location: The port of Wilhelmshaven is interesting for manufacturers, importers and users of hydrogen.

answer the question: What synergies are there between the individual projects? Can you organise something like a large chemical park in which everyone can take something from the other in some form or give something to them, and thereby create synergies? And that has evolved. There are now 30 companies working on projects, and DENA then looked at the question in the second step: what infrastructural requirements do we need to create? This concerns the question of infrastructure connections for electricity, for gas, for hydrogen, for CO2. There are projects that generate CO2 and where the CO2 then has to be processed in some form. But there is also the question of what happens to the waste heat during electrolysis. Who can use it? This extends to the question of where the water comes from, what infrastructure is needed, and the question of whether it makes sense to organise a joint fire department. So far, the Major Incident Ordinance requires every company to have its own fire department, which will hopefully only be there. The question naturally arises: Can you create synergies by bringing these things together? This is a trivial question and should actually be logical, but it is not self-evident. We hope that this will also provide support for the viability of the projects.

That sounds very complex and exciting. What is the port's work?

As a group of companies, we have first described the challenges and also the requirements that come from the projects. What is important for the port is how much shipping traffic will come. What are the nautical challenges, what are the depth requirements? Wilhelmshaven has a deep-water harbour with a draft of 18 meters, but that is not the case everywhere. So something has to be dug up somewhere. What are the logistics downstream of the port? So how does the hydrogen or the ammonia or whatever get away from the port? This then particularly affects the question of railway infrastructure. There are various bottlenecks, Oldenburg downstream, that need to be processed.

There's a lot to do there. In principle, we have now prepared the tableau with the tasks up to the question: how are the areas used optimally, where do you put the electrolysis, how can you organise it sensibly? How do you create space for industrial companies that can access the energy in case of doubt? The questions are diverse. The alternative would have been for each individual company



Import terminals, production, processing, storage, use and forwarding: all functions are in one place.

? I'm happy about that and it actually sounds like a complete reorganisation. In this DENA report, several unique selling points were identified for Wilhelmshaven, which many players were probably not aware of before, meaning that they have to be specifically advertised in order to receive funding. So this now seems to be going in the right direction, towards the future, energy transition, climate protection. Can it also be commercially worthwhile?

They are all private companies that, in some form, associate this commitment with the hope that they can set up a commercially viable project. Yes, and of course, the Wilhelmshaven region does have certain advantages, unique selling points. This has also grown historically. On the gas side, the energy flows basically come via the Wilhelmshaven region, be it from Norway, Emden, Dornum, the Netherlands, Bunde, the east-west connection, the south connections, and then there is Etzel as a gas cavern location. ►

to go to the authority with their project. This would probably not have been possible from the authorities' setup. So in this respect we have basically done a bit of preparatory work for the authorities.

FACTS AND FIGURES

The **Onyx Power Group** was founded in 2019 as a European energy supply company and expert in thermal energy generation. With around 2,350 megawatts of installed generation capacity, its coal and biomass power plants in Farge, Rotterdam, Wilhelmshaven and Zolling form a central pillar in the local energy supply of several regions in Germany and the Netherlands. The company, headquartered in Berlin, employs around 400 people. By 2030, the existing power plant locations are to be prepared for the future by converting them to alternative energy sources beyond the coal phase-out. The Farge power plant in the north of Bremen is to be converted to the thermal utilisation of waste wood. In the long term, there are plans to expand the site towards local hydrogen production. The nature conservation association NABU suggests that the owners convert the coal-fired power plant into a storage power plant, a so-called Carnot battery. During times of excess electricity, a salt solution is heated to high temperatures. In times of electricity shortage, the heat would be used to generate steam, which would drive a turbine that would generate electricity again.

As early as 2026, climate-neutral district heating from hydrogen in combination with green electricity from the biomass plant on site will be produced in the Zolling Energy Park. The production of green hydrogen via an electrolyser is also planned. Onyx Power took important steps at the Zolling site with the construction and operation of a biomass power plant and a sewage sludge drying plant. In the port of Rotterdam, Onyx Power plans to build a plant to produce low-carbon blue hydrogen (autothermal reformer). With a capacity of 1,200 MW, the ATR could produce ~300 kilotons of blue hydrogen per year on an industrial scale to reduce industry CO2 emissions. The plant could be operational by 2028 and would be located next to the existing Onyx power plant on the Maasvlakte. hfs

What I think is completely underexplored in the hydrogen discussion is the question of how do you take a volatile profile that comes from the electrolyser, offshore wind or photovoltaics and create a profile that an industrial company can ultimately use

? That means 8,000 hours of energy supply, which requires storage.

This is not discussed at all. But we have endless potential for this in the Wilhelmshaven region because there is enough storage space in salt caverns. There is also a connection to the core network for hydrogen. The connection to the south, towards the Ruhr area, where large industrial consumers are located, provides good conditions, and Wilhelmshaven with the deep-water port is predestined for imports.

? Now it is said that if this really starts now, the need for hydrogen will be so great that it cannot be solved without importing it anyway. But you now want to cover at least part of the country's needs through your production. Then are you also thinking about fixed purchase contracts with industrial companies?

If someone has a project for electrolysis and producing domestic hydrogen, then the organisation is a big challenge. The next challenge is then the question of how does this hydrogen get to the consumer and where is this consumer? And is it in the core network or is it not on the core network? That's the basic requirement. Of course, a location is attractive where there is energy, where distances are short and where you are not dependent on having a transport network. But that also means that one or another industry is faced with the challenge of relocating elsewhere. I think that is rather difficult. There are various criteria that play a role. Energy is not the only criterion. But if someone is planning a new location somewhere anyway, then Wilhelmshaven is predestined. But the important thing is that the application also fits the value chain. You need a Carbone Contract for Difference because the system is not economically self-sustaining at the moment. This is not trivial; we still face major challenges.

! Thank you very much for this explanation. I wish you much success!

The interview was conducted by Hermann Schmidtendorf.

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Germany's ports:

“NATIONAL PORT STRATEGY” IS MEANT TO STRENGTHEN GERMANY'S PORTS

Germany has seven commercial ports of national importance on the North Sea and four on the Baltic Sea, 35 smaller North Sea ports, but also 121 inland ports. The largest of them is Duisburg. It is also the largest inland port in the world. In principle, the financing of the ports is a matter for the states. Depending on the region and location, the tasks and requirements vary. But all ports and the politicians of the respective federal states agree on one thing: the financial flow from the central federal budget must be increased. So far, the federal government has contributed 38 million euros annually through the so-called **port load equalisation**. The coastal countries are demanding ten times higher amounts. In the federal government, the Ministry of Economic Affairs advocated greater support, while the transport and finance departments slowed down.

There is little wrong with the investment goals. The Federal Association of Public Inland Ports (BÖB) points out that **many quay walls in inland ports need to be replaced after many years of use**. A port operator cannot shoulder the resulting one-

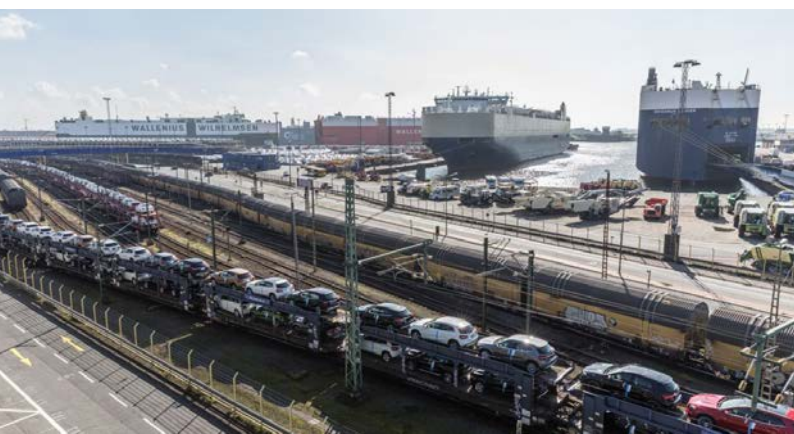


off costs alone. Therefore, on March 18, 2024, BÖB managing director Marcel Lohbeck called for a joint federal-state funding program based on the model of federal-state funding for shore power systems. The BÖB would like a federal share of four million euros each in the ramp-up phase of the first and second years. After that, a demand of 30 million euros is expected over three years. After the ramp-up is complete, 35 to 40 million euros would be required for another five years.

At a reception for the North Sea ports in Berlin in June 2023, Hamburg's Economics Minister Melanie Leonhard emphasised the good cooperation between the hubs of Bremerhaven, Hamburg and Wilhelmshaven. She referred to the shared digital container and ship information platform "German Ports". However, **the ports and the corresponding federal states cannot solve many current challenges on their own**. The president of the Central Association of German Seaports (ZDS) and also head of the Hamburg Port Company, Angela Titzrath, referred to the weak economy, inflation, pirate attacks in the Red Sea and other geopolitical crises. In contrast, ►

The company BLG Logistics takes cars to the terminal in Bremerhaven by train.

Credits: BLG



energy imports are increasing significantly as a result of Russia's sanctions. According to Minister Leonhard, it is not just about the federal government's financial participation, but also about a "serious commitment to the challenges we face as ports".

German port strategy comprises 5 areas of action and 139 individual measures

On March 20, 2024 the time had finally come. After many months of debate, **the German government cabinet decided on a new "National Port Strategy"**. It replaces the strategy concept from 2015. Expectations were high – after all, at a National Maritime Conference in 2023, Chancellor Olaf Scholz and Vice Chancellor Robert Habeck emphasised that the ports were being "politically neglected" but were important for the climate goals. The new strategy concept was well received at the German Transport Forum DVF. "The goals have been set correctly," explained managing director Dr. Heike van Hoorn. "The ports are of strategic importance for the competitiveness and transformation of Germany as a business location. They actively accept this role. Now crucial are the concrete measures taken by the federal government, which must follow the strategy: more investments, fewer bureaucratic procedures and a significantly faster pace of implementation."

Other associations as well as the economics ministers from the northern German federal states concentrated on the flat-rate financial demand that the central budget should increase its expenditure from "port load equalisation" tenfold. The new strategy concept, however, contains this sobering statement in black and blue: "All proposed measures are subject to the available budget resources and the financing responsibility." For Federal Transport Minister Volker Wissing, this is a normal procedure: **"First the plan, then the money!"** The Schleswig-Holstein member of the Bundestag Stefan Seidler can partially understand this. **There is a lack of space in coastal countries for the storage of offshore systems. The Offshore Wind Energy Foundation estimates that up to 200 hectares of such areas could be missing from the ports by 2029.** To achieve this, the federal states would also have to develop clear concepts. Seidler: "It takes more than quick demands for additional money from the federal government." And the German Bundestag must be more closely involved in

the decisions than before.

German inland ports also complain about a lack of space. In 2021, the Federal Office for Goods Transport (BAG) published the results of a survey among 85 operators or owners of port companies. 75 percent of the companies stated that they were at 100 percent capacity in at least one criterion, such as commercial, industrial, container handling and goods handling areas, handling facilities, office buildings, warehouses or transport infrastructure. Around a third of the inland ports surveyed plan to expand the port area in the next few years in order to increase container handling areas and expand the transport infrastructure. Some complaints were made about difficulties in complying with some environmental regulations, for example in complying with noise limits.

Ports need more space

The new national port strategy includes five areas of action. It is divided into a strategic part and a measures part with 139 specific work orders. This also includes the question of the additional space required.

Positions 1.15 to 1.19 specify the following for area planning in Germany's ports:

► "1.15. Prioritise the provision of space for companies relevant to the energy transition and transport transition, with appropriate instruments being available for this purpose in the form of municipal pre-emption rights. (from now on, federal states)

► Consider a general exemption for areas within (public) ports in §§ 78 and 78a WHG, which generally exempts them from the designations as flood areas or exempts them from planning and use bans. (2025, Federal Government)

► Consider a trivial limit for the retention area compensation for construction measures in areas within the port area that have no relevance to flow in the event of a flood. (2025, state/federal).

► Continuously ensuring that the use of port areas defined as special areas in the BauNVO continues to be fully possible for the port industry and the businesses based in the port area and is not made more difficult by encroaching residential development and the associated requirements, for example in emissions law." (2025, states/federal government) ►



This is very concrete and shows the future development path by specifying time goals and responsible institutions. Other objectives also correspond to the specific requirements of the maritime economy. For example, point 1.8 says: "Review and standardise the planning and approval procedures and reduce processing times. This includes, among other things: also the **acceleration and simplification of large and heavy load transports handled by road** in order to shorten the interim storage period in the port."

Under point 11.7. immission control and water law requirements for the handling of goods in ports should be reviewed "with the aim of **reducing hurdles for the handling of port-related goods** in ports without lowering environmental standards." And the following has also been demanded by the sector for a long time and is now part of the port strategy: "At EU level, advocate for a uniform EU-wide interpretation of the tonnage tax and limit it exclusively to pure ship transport between two ports."

The new strategy assigns some additional tasks to the German ports. The **resilience of the ports in the face of climate change** should be increased on the basis of uniform data bases (5.6.). The requirements for climate, nature, environmental, civil and

disaster protection should be taken into account. But **the ports should also be involved in "military defense matters, especially for allied forces in transit"**. Digitalisation, personnel recruitment, training and automation are other key focal points. To finance this, a high level of participation by German ports in European funding programs such as the Connecting Europe Facility (CEF) should be supported "in order to achieve the highest possible returns from the CEF to Germany".

Provisions to strengthen rail connections are also useful (5.25). The Long-Distance Rail Freight Network Promotion Act (SGFFG) should be amended "as quickly as possible" in order to **enable the expansion and new construction of port railways** in compliance with the EU. The requirements for the safety of early start of construction should be made easier.

It is unsatisfactory that under point 5.28. after all the "consistent implementation of the priority projects to **eliminate bottlenecks in the rail hinterland connections of the ports**" is required. However, a concrete example of such a bottleneck is the Bad Oldesloe – Neumünster freight railway line. And this railway line, like the port in Kiel, has not yet been proposed by the German federal government for integration into the trans-European transport core network (TEN-T). ►

But after the debate is before the debate. The point 1.29. provides for the **establishment of a "federal-state staff for ports"** under the direction of the Federal Ministry of Transport. This committee is intended to discuss "possibilities of port cooperation and the question of financing as well as energy issues" and develop solutions. This should then (5.1.) also include a "concept for financing port infrastructure to fulfill national tasks".

The head of the Bremen logistics group BLG Frank Dreeke is not completely satisfied with this. On May 2, 2024, he explained to the weekly Welt am Sonntag that the strategy as such was fine. But: "We now have to undertake every single measure together with the

federal and state governments. Some projects have to be implemented quickly, especially the **renewal of the quays in the ports on the North and Baltic Seas**. If they are ailing, they need to be strengthened. The federal and state governments are responsible for this task, the federal government cannot withdraw from this because the seaports are on federal waterways."

The concerns are understandable. But if everyone involved takes their tasks seriously and acts quickly enough, **the new national port strategy** can still **provide a significant impetus for the development and strengthening of German ports**.

Hermann Schmidtendorf

Port in Cuxhaven:

KEY TO WIND ENERGY

It happened at the last moment, but "just in time". The German federal government agreed to contribute 100 million euros to the **planned expansion of the port of Cuxhaven**. The state of Lower Saxony contributes 200 million. The financial decision was urgently needed – because the corresponding planning approval decision expires at the beginning of 2025. The construction must first be put out to tender. Without the decision now made, the port would have had to start the entire bureaucratic planning process from the beginning.

Cuxhaven plays a key role in the expansion of wind energy in Germany. So far, only for this port has there been a decision in Germany to build new berths for loading heavy loads. These are crucial for transporting the components for wind turbines, which weigh several tons. The existing berths at German ports are far from sufficient for the energy goals.

Germany wants to build offshore wind farms with a capacity of 30 gigawatts by 2030 and even 70 gigawatts by 2045. This requires **the construction of around 7,000 wind turbines**. Most of the approximately 80 metre long rotor blades are brought to



A special ship with wind rotors for Cuxhaven.

Germany by sea. Therefore, Cuxhaven will be the first port to be able to bring this large amount of components ashore. Other German ports also need to be expanded – including for onshore wind energy.

The President of the Federal Wind Energy Association (BWE), Bärbel Heidebroek, demands that European companies in particular should be involved in the expansion of this environmentally friendly energy. The European Union's Net Zero Industry Act serves this goal, which states: 40 percent of all green technologies must be manufactured in Europe. hfs

Port of Hamburg and MSC:

THE PORT OF HAMBURG AND MSC ARE PLANNING A STRATEGIC PARTNERSHIP

Hamburger Hafen und Logistik AG HHLA operates three of the four container terminals in the Port of Hamburg. Their throughput in 2022 was around 6.4 million TEU. HHLA also operates through subsidiaries in the ports of Trieste/Italy, Muuga/Estonia and Odessa/Ukraine. **The container shipping company MSC and Hamburg signed a binding preliminary agreement to establish a strategic partnership on September 13, 2023.** To date, the city of Hamburg owns around 70 percent of the listed HHLA. Now the city wants to retain a majority of 50.1%, MSC wants to take over 49.9% of the shares in the future joint venture.

The city expects the deal to bring more cargo to Hamburg in the future. **MSC has pledged to bring at least one million standard containers per year to Hamburg from 2030.** Both partners want to strengthen HHLA's equity capital by a total of 450 million euros. A new German headquarters for MSC will be built in Hafencity, and the cruise division MSC Cruises will also have a new home port here. MSC is expected to more than double the number of employees in Hamburg with 700 jobs. The partnership comes at the right time for HHLA. In the previous year, 6.3 percent fewer containers were handled at the terminals than in the previous year. There was also a significant drop in profits – the surplus shrank to 20 million euros compared to almost 100 million euros the previous year.

For MSC, the desired Hamburg deal fits into the current global strategy (see also pages 5 and 7 in this issue). **In mid-November 2023, MSC decided to establish a NewCo with the Italian state railway holding company Ferrovie dello Stato Italiane (FS)** in order to strengthen intermodality between sea and rail



Worldwide: an MSC ship, here in the Port of Long Beach.

Credits: MSC

by building additional terminals. FS will own 51 percent of the new company through its company Mercitalia Logistics, while the remaining 49 percent will be held by Medlog, MSC's intermodal services subsidiary.

In Hamburg it is also suspected that MSC is particularly interested in the **HHLA subsidiary Metrans**. Metrans offers high-frequency rail connections with seaports on the North Sea and the Adriatic. As a leading company for container transport in seaport hinterland traffic with Central, Eastern and Southeastern Europe, Metrans has its own inland terminals, special locomotives and container wagons. The port operator PSA from Singapore and two individuals have reportedly lodged objections to the partnership with the EU Competition Commission. If formal proceedings are initiated there, the completion of the deal could be delayed. The ver.di dockers' union also made negative comments. They fear possible negative effects on employment, working conditions and tariffs. The shipping companies Hapag-Lloyd and Maersk (see page 5 of this issue) might probably partly withdraw cargo from Hamburg, and the ports in Bremerhaven and Wilhelmshaven could benefit from this. *hfs*



The Crystal Endeavor in front of the MV Werft Stralsund during delivery in 2021

Credits: Klugschnacker CC BY-SA 3.0

German Baltic Sea shipyards:

WIND POWER AND MILITARY

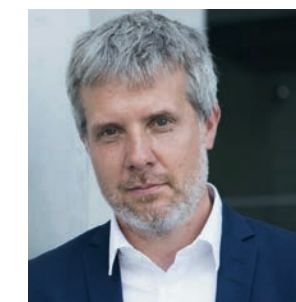
It was a good day for the future of the Rostock-Warnemünde shipyard location. On November 15, 2023, representatives of the federal government, the state of Mecklenburg-Western Pomerania and the companies Meyer Group and Smulders decided on the key points to use the site for the construction of 2 GW offshore converter platforms. This was also a success for the federal government's coordinator for the maritime economy and tourism, Dieter Janecek (The Greens), who took over this task from Claudia Müller in mid-January 2023. Under Federal Economics Minister Robert Habeck, the coordinators are more closely involved in operational work than before.

The availability of 2 GW converter platforms is crucial for the grid connection of offshore wind farms. Without the platforms, the electricity produced offshore cannot reach the power grid. There will be a need for around 135 new 2 GW converter platforms in Europe by 2050. In Germany alone, more than 30 such converter platforms will be needed from 2026 to 2045 – with a cost volume of around 2.5 billion euros per platform. This market is a great opportunity for German shipyards. To date there is no production location in Germany and only one in Europe.

The reorientation in Rostock became necessary because the previous owner of the Wismar, Rostock and Stralsund shipyard locations, Genting Hong Kong, had

to file for bankruptcy in March 2020. Genting specialised in the production of cruise ships. But production and therefore also financing came to a standstill due to the global corona pandemic. On January 10, 2022, the rescue negotiations between the German federal government, the state governments and the Genting shipbuilder MV Werften finally failed.

But public German support allowed the world's largest cruise ship, the Global Dream, to be completed in the shipyard in Wismar and sold to the shipping company Disney Cruise Line. The Crystal Endeavor was completed at the Stralsund site and is now the Silver Endeavor, the largest mega yacht for expedition trips in both tropical and polar waters with ice class. The German Navy purchased part of the Rostock location in the summer of 2022. And the company Thyssenkrupp Marine Systems (TKMS) took over the Wismar site in order to build submarines there. When production ramps up in 2024, around 800 employees will be hired. The German Navy's K 130 corvette is also to be built here. Before the Genting bankruptcy, around 2,000 people were employed at the locations mentioned. *hfs*



Dieter Janecek.

Credits: D. Janecek

SHIP LOSSES ARE FALLING, ACCIDENT NUMBERS ARE AT THE SAME LEVEL

In 2022, there were 38 reported total losses of ships worldwide, compared to 59 the year before. In ten years, annual losses have fallen by 65 percent. The Safety and Shipping Review 2023 by the insurer Allianz Global Corporate & Specialty SE (AGCS) presented this pleasing result. The annual AGCS study analyses reported ship losses and accidents over 100 gross tons.

Global hotspots for ship losses are consistently the maritime regions of South China, Indochina and Indonesia. Approximately a quarter of total losses in 2022 affected cargo ships (10), with sinking being the main cause in over half across all ship types. The second most common causes were fire and explosions. In four cases there was a ship collision. However, the number of shipping accidents remained at a consistently high level (3,032 in 2022; 3,000 in 2021). Almost half of the global incidents (1,478) were due to machine damage and breakdowns. Collisions are in second place and fires are in third place.

An example of such an incident is the “Tokyo Express”. The container ship left Rotterdam in 1997 for New York. About 32 kilometres from the English headland of Land’s End, the ship got caught in a storm and was hit by a monster wave. 62 containers went overboard. One of these containers is still the dream of many treasure hunters today. Because it contained around five million rare Lego bricks. These were spe-



cial bricks for toy building sets with depictions of sea adventures – for example rubber boats and flippers, diving bottles, lifebuoys and harpoons, but also animals and mythical creatures. And stones from this container are still washed ashore on the coasts of Belgium, England and Ireland to this day.

At the end of April 2024, the community of Lego treasure hunters, the “beachcomber”, was euphoric again. A 13-year-old boy found one of just 4,200 plastic octopuses on board the container on the Cornish coast. The boy’s father told the PA news agency that he and his son had been looking for this octopus for two years! Of course, the “Lego Lost At Sea” account on X, formerly Twitter, reported in detail again. Here, the ideal value of the “treasures” found may be greater than the insurance value of the lost container – it’s nice when an accident brings so much joy! *hfs*



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Krüger GmbH: Insulating gratings and profiles for railways, maritime and public spaces

A CARGO FREIGHT JOURNAL conversation with the experts for GFRP system constructions Anett Holz and Frank Lau from Arthur Krüger GmbH, Barsbüttel, Germany.



Credits (3): Hermann Schmidtendorf

CARGO FREIGHT JOURNAL: You represent a company that specialises in, among other things, rectangular gratings and cover plates. What is so special about that?

Frank Lau: Do you know GFRP, glass-fibre reinforced plastic? We invented special solutions...

Anett Holz: We have found safe solutions...

Frank Lau: ... insulating solutions for the railway, but also for the maritime sector and public spaces. These are gratings in all variations, with different meshes, with covered panels, as a covering and, of course, profiles for incredibly great constructions.

Anett Holz: Wherever steel or wood is now used, you can also use plastic: bridges, walkways, platforms, work platforms... We now even build bridges entirely out of plastic for parks or footpaths and cycle paths, bridges for communities or cities throughout Germany and also in the D-A-CH area.

Frank Lau: Wherever you use wood or steel, in difficult environments, plastic also works. The advantage of plastic is that it is chemical resistant and requires little maintenance. We install it and have no more worries – done.

? Will such plates last as long as steel?

Frank Lau: They will last significantly longer. Because when it comes to steel we also talk about corrosion. And anyone who knows steel in the saltwater sector knows what happens there.

? But how do you ensure that the plastic doesn't crumble?

Anett Holz: It's plastic. To put it simply, glass fibre reinforced plastic is a matrix that is filled with glass fibres. This gives you advantages in terms of building physics. It has incredible strength. The only thing you have to say is that the overall height is a bit higher than if you use steel.

Frank Lau: Absolutely, we are clearly dimensioned differently at GFRP. But of course many people know GFRP from boat building. The laminate there cannot be compared with our elements. There are air pockets in the laminate. Then you have a capillary effect afterwards, osmosis is a big topic. This

doesn't happen at all in these profiles because they are manufactured in a closed system. This is called pultrusion or extrusion process. Glass fibres are introduced into the system, then the resin is fed in, pressed through a mold and hardens. This prevents air pockets and ensures a consistent profile.

? At exhibitions you also have a large-volume profile with a uniform surface. Does that carry a lot of weight?

Anett Holz: When our designer walked through the workshop with a two-metre element on his shoulder, the others looked: How can you carry that? Because you think it's steel. But it's not painted steel, it's plastic. So you can wear that well. The weight of course has a huge advantage, for example on embankment stairs that are difficult to reach. You don't need a crane. You can simply carry it and install it – done.

? And where do you produce all of this?

Frank Lau: The profiles come from Denmark and Holland with general building authority approval,

so they can be used in any area. And we now get the gratings from Turkey. So everything comes from Europe.

Anett Holz: Everything is certified. All the documents you need to be allowed to build anything in Germany are given. We have a portfolio with profiles, bars and cover plates. And if you wish, we can use it to construct a wide variety of things that are needed. We have fitters who will install it on site. This starts with planning and ends with execution.

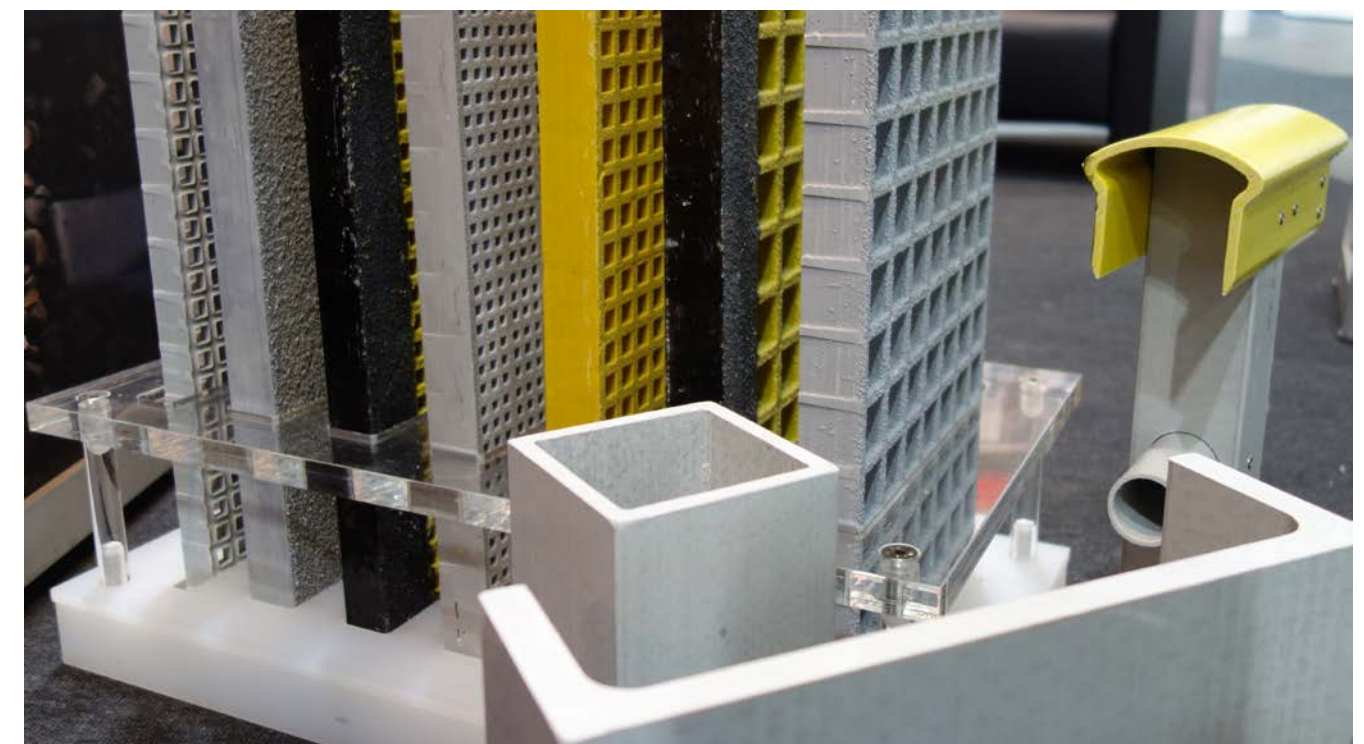
? So you also make sure that it is installed correctly?

Frank Lau: Yes, of course. There is also a statics for all constructions, in many cases even a test statics. And that means we are well protected.

? What kind of crane baskets do you supply?

Frank Lau: Road-rail vehicles are sometimes equipped with crane baskets in order to access the overhead electric lines on railway tracks. With such baskets we are of course also talking about the

Durable, insulating, versatile: gratings, panels and profiles made of GFRP.



best possible insulation. And these baskets are now also made from GFRP.

? Then I don't have to worry about getting hit if I get close to the overhead line?

Frank Lau: Don't worry! Grounding is then not necessary because these GFRP baskets are completely insulating.

? Then may I conclude that, despite these turbulent economic times, you are generally positive about the future?

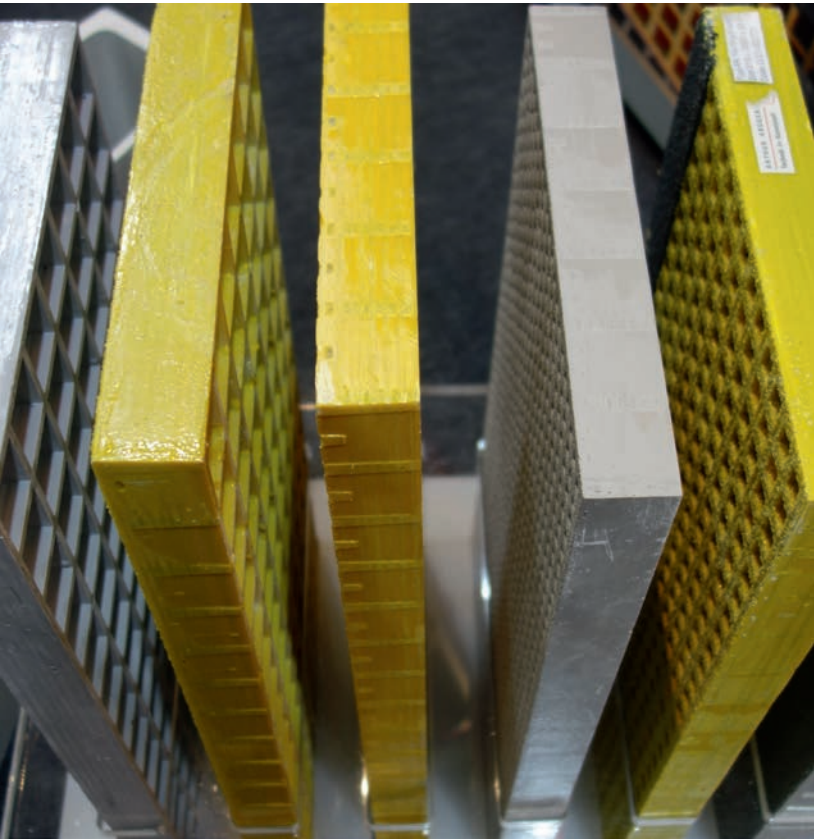
Anett Holz: Of course! This is a young, forward-looking material. It is not yet very widespread and has a lot of potential in all areas.

! Thank you very much for the informative conversation!

The interview was conducted by Hermann Schmidtendorf.

FACTS AND FIGURES

The sole owner and managing director Nils Krüger continues the tradition of the "Arthur Krüger Vulkanfiber-Zentrale" founded in Hamburg in 1920 in the fourth generation. In the area of GFRP plastics – plates, rods & pipes – 20,000 products are offered under 32 brands. The company is also well positioned in the areas of technical plastics POM & PET, plastics for food grade POM, PET & PUR as well as high-performance plastics PEEK, PTS & PTFE. Krüger GmbH also offers plastic plates, rods or tubes made of PLEXIGLAS, PERSPEX & DIBOND for glazing, displays, covers, interior cladding, signs, room dividers or cladding, for example for the advertising industry, trade fair builders and displays.



Gratings are available in a wide variety of formats and meshes.



27 & 28 Nov 2024:

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"The European Silk Road Summit is an event about the New Silk Road in Europe and brings together hundreds of professionals from the rail freight sector every year. The European Silk Road Summit is the perfect event for all professionals working on the Silk Road and its associated network. The 8th edition "Vienna, the Railway Capital of Europe" will take place on 27 and 28 November 2024 in Vienna, Austria."

With these words of praise, the website "Port of Hamburg" is promoting attendance at the high-profile congress of the Dutch Pro Media Group, which is taking place this time in Vienna. Information and registration at: www.silkroadsummit.eu. In fact, this annual summit is the best opportunity to obtain first-hand information about the status of transport routes between Asia and Europe. The organisers say:

"The European Silk Road Summit 2024 features the position of Central Europe along the Silk Road market. The starting point of this edition will be the role and importance of Vienna in Eurasian transport and logistics, as well as the latest relevant developments. From there on, the

conference will expand its focus to various areas such as the current operational environment amid sanctions, the rebounding volumes and relevant investments, business segments and their development, and policies that could affect the Silk Road industry directly or indirectly."

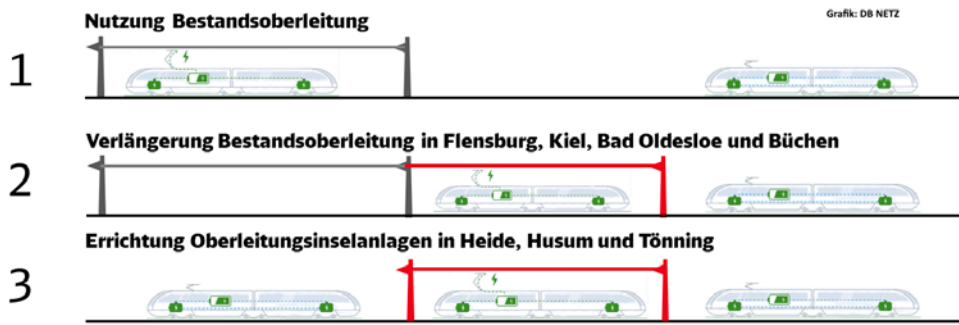
On the first day, an excursion to Metrans' hub in Dunajska Streda/Slovakia will be offered. Separate registration is required for this. On the second day, various lectures and discussion rounds will focus specifically on the so-called middle corridor of the Silk Road, the role of Vienna and Germany, but also on dangerous goods transport and temperature-controlled freight and e-commerce in the transport sector. And don't forget: the unique opportunity for networking! *hfs*

Not trivial:

THE CHARGING LOGISTICS FOR BATTERY MULTIPLE UNITS

In 2021, 61 percent of railway lines in the Federal Republic of Germany were electrified. In Schleswig-Holstein it was only 27 percent. This was calculated by the non-profit transport alliance Pro-Rail

Alliance based on official statistics. In order to remedy this unfortunate situation, battery trains from Stadler are now in use in regional passenger transport in Germany's northernmost federal state. ►



Battery trains can replace diesel traction and are therefore just as climate-friendly. But their batteries have to be recharged after about 80 kilometres of travel. This can happen while driving in a section of route under electric contact wire. Sometimes an existing electrified route section can be extended by a few kilometres so that one battery charge is enough to travel between two electrified sections, even under unfavourable weather and load conditions. Otherwise, charging islands or fast charging stations will be set up in non-electrified sections.

That sounds logical – but it's not a trivial matter. A wide variety of considerations must be taken into account when creating the charging infrastructure. This was developed by Martin Bruns from DB Engineering & Consulting GmbH and Kai Wittig from DB Energie GmbH, who played a leading role in the development of the charging structure. An existing traction current overhead line cannot be extended "just like that". A battery multiple unit cannot run indefinitely under an existing overhead line and "run as I please". Why? Networks are dimensioned according to known conditions. However, a battery-powered multiple unit that runs and charges its cells at the same time uses more energy than conventional trains. And overhead lines peripherally connected to the network over a longer distance cannot be used or extended at will.

When entering and leaving an electrified section of the route, a signal must be given in good time, which the train crew must of course follow: "Bail down"/"Bail up". This is easy to solve on a straight line. However, this is more difficult to achieve in larger train stations and parking facilities. Because there are already a lot of signals there anyway, and certain distances have to be maintained. That's why the rail experts set up their own working group to find practical solutions. At

some points along the route, a catenary island system has to be built in a non-electrified section so that the batteries can be charged there. Then it needs to be clarified, according to Wittig and Bruns: "How much of an island can it be?"

The length of the train is sufficient for a stationary shop, for example on a station platform. However, it must be clarified whether the planned downtime there is sufficient for charging. And even if the answer is positive, there are very practical questions that need to be clarified. Example Tönning: There is a level crossing directly in front of the platform. Then perhaps it would be worth extending the island's overhead line beyond this crossing so that charging can be carried out safely at any time, even if the crossing is blocked? Normally, a substation is built that converts the feed from the 50 Hz network to 16.7 Hz 15 kV traction current. But then you also have to make sure that emergency managers can be reached near such an island. These are intended to help get traffic back into operation quickly in the event of an incident.

And of course there is more to consider! For the first time on a global scale, such a large railway network was converted to power battery-powered multiple units. So one can pay respect to the German engineering skill that lies behind the sober information: A total of around eleven kilometres of overhead line sections were newly built in seven places. DB's energy experts reported on their work at the leading specialist congress for alternating voltage in the railway industry a.c. rail power supply in Leipzig. This conference takes place annually alternating with the rail power supply congress for Direct Current. The next acrps conference will take place on the 13th/14th. March 2025 in Leipzig. Contact: acrps@rail-s.de • <https://acrps.org/en/> Hermann Schmidtendorf

Stadler Rail: “Battery trains are an excellent solution in case of partial electrification!”

? **rail & mobility:** Since 2024, 55 battery trains from your company have been in daily use in the northernmost German state of Schleswig-Holstein, double-unit Flirt-type trains. Are you proud that your battery trains are now running regularly in traffic in Germany for the first time?

Jure Mikolčić: Proud for sure! The pride has been hard earned starting with the decision in 2015, 2016 to build a test vehicle for this technology. That also meant courage. You know, you have to spend a lot of money to afford a rail vehicle that you initially use purely for testing purposes. I am very grateful that this decision was made before my time. A lot of basic work has been done in-house. And when in the end it all fits together as well as it does now, then it's just beautiful.

? In 2018 you presented us your first prototype on your Berlin factory premises. The technology has certainly developed further since then, simply through further developments in batteries?

Jure Mikolčić: Yes. You can see that just by the range. The original design of the vehicle – and still is in Germany – was to achieve a range of 80 kilometres like this product does. Why? Because 40 percent of the routes in Germany are without overhead lines, and 80 percent of these routes without overhead lines have a gap of around 80 kilometres to bridge. That's why the vehicle was designed for 80 kilometres. But in December 2022 we made it into the Guinness Book of Records with our test vehicle that covered 224 kilometres without charging. You can see that this is almost three times the originally intended distance. This shows, for example, what happened on the battery side. ▶



The graduate economist (University of Trier) Jure Mikolčić (left in the picture) has been CEO of Stadler Deutschland GmbH since 2019. He also represents the group's second largest location as Executive Vice President on the Group Executive Board. He has been Vice President of the German Railway Industry Association VDB since 2019. Previously held managerial positions for Siemens and Knorr-Bremse. Steffen Obst is sales manager at Stadler Germany.

Credits (3): Hermann Schmidendorf

? This also creates security for particularly cold days, when more power is needed for the heating, for example, or when you have a little more incline. Does that mean you have the reserve?

Jure Mikolčić: We definitely have a reserve. The 80 kilometers are planned and will be enough. We always charge with 15 KV every now and then, and there is enough installed power in the vehicle.

? How do you manage the battery supply so that a supply chain doesn't cause problems at some point? Do you have a replacement solution or enough batteries in reserve under the conditions under which such a battery can be stored?

Steffen Obst: The issue is that you have to make the vehicle concept so flexible that you can work with any battery. We have specific installation spaces in the vehicle and we have designed it so that we get the maximum possible capacity regardless of the battery technology. There are different lithium-ion pairings, and depending on how this pairing is on the

chemical side, this battery has more or less positive properties. Either it is particularly capable of high currents, or it is particularly robust, and we use that for different projects so that we are flexible and not dependent on a single supplier.

We also notice that development continues. We benefit from the knowledge gained from road traffic. We can accommodate higher performances in the same installation space. So we may state that the vehicle is future-proof so that after ten or 15 years we will be able to use new battery technology to achieve even better properties.

? You give a good keyword there. A train like this should run for a life cycle of at least 30 years and perhaps receive a retrofit halfway through that time. And only then do you try to replace the battery. You would probably plan it the same way?

Steffen Obst: That is the big goal. Of course it always depends on the specific tender. There are other procurement procedures in which the ▶

A battery FLIRT at Lübeck main station.



mileage of the vehicles is so much higher that you then have to exchange them in the middle. It really depends on the environment. What is the traffic like, what are the mileages per day, and how can I recharge? It may be that you save on the rail infrastructure and would rather put more strain on the battery. So, there is always an optimum that you try to find, and that can of course be after 15 years, which is about half of the vehicle's lifespan, that you make this swap and then switch to more modern technology.

? Because then another technology will definitely prevail again?

Jure Mikolčić: From my experience, I am now also responsible for the vehicles in the VDB Association of the German Railway Industry: When I talk to politicians, you have to be cautious with general statements, just as Mr. Obst is. This is really relevant, what operating conditions the vehicle is exposed to, what timetables are valid, what topography, etc., and then you have to look at it carefully.

? I suspect that, in consultation with the operator, you are now watching and registering everything very carefully. Do you have any agreements that you can then also use the data for optimisation? Wouldn't that be helpful for everyone?

Jure Mikolčić: We actually have to do that simply because we are responsible for the maintenance of the vehicles, so we also assume the risks of the battery and the lifespan risks. We have responsibility there, and that's why we're keeping an eye on it, and that's also a learning effect for the operator. Switching from a diesel vehicle to an electric vehicle is a new development, and we can of course help with our experience.

? So it's a bit of a pioneering achievement because you then want to use additional trains?

Jure Mikolčić: Absolutely. And for us as a manufacturer it is of course important to offer optimal solutions. We need the data, and of course we want to use the data to win the next tender. We are a business company that wants to deliver top technology.



Easy-to-read information system, comfortable seats: the interior of a new "Flirt Akku" train.

? You have now also won a tender in Austria. The ÖBB is ordering 16 electrically powered Cityjet battery-powered multiple units, which will run along the Kamptalbahnhof in Lower Austria from 2028. The framework agreement even allows orders for up to 120 battery-powered multiple units. It's good that things are continuing in neighbouring countries too!

Steffen Obst: Yes. I think this will be the case throughout Europe. Wherever there is the issue of non-electrified routes, you have to think about how you can get away from diesel. And batteries are an excellent solution when you have partially electrified routes like here in Germany. If there is no contact wire at all, if there is no electrification anywhere, like in the USA, for example, investing in hydrogen is of course worthwhile.

! Mr. Mikolčić, Mr. Obst, thank you very much for the interview!

The interview was conducted by Hermann Schmidtendorf.

SCANDINAVIAN RAIL

BY ROTAIA MEDIA OPTIMISATION

WHEN INNOVATION CREATES ADDED VALUE: OPTIMISING THE DIGITAL TRENDS THAT ARE REVOLUTIONISING SCANDINAVIAN RAIL.

Bringing together the leading rail experts from the Swedish, Norwegian, Danish, Finnish and Baltic Railways to discuss how they are optimising the latest digital trends to increase capacity, improve reliability, enhance availability and drive down maintenance costs.

The conference will not only address the concepts and lessons learned for digital success, but the importance of how data is optimised to develop an intelligent infrastructure, as well as to enhance fleet management efficiency and the availability of rolling stock assets in the Scandinavian region.

For speaking, exhibiting and sponsoring opportunities, please contact Ben Holliday: ben.holliday@rotaiamedia.com



PESA is working on an electric and hydrogen-powered freight locomotive

A CARGO FREIGHT JOURNAL interview with Maciej Grześkowiak, Director of Strategic Projects and Communication at Polish railroad manufacturer PESA.

CARGO FREIGHT JOURNAL: At the TRAKO railway trade fair in Poland in September 2023 you presented your hydrogen locomotive. How is the promotion of this new development going?

Maciej Grześkowiak: Our hydrogen locomotive has been approved by the competent authorities, is approved for traffic, already has its first customer, and what's more, we are already talking to several customers and it looks like we will produce shunting hydrogen locomotives and they will enter into operation. And I think that the first units will be delivered already in 2025.

We will show further new vehicles 2024 in Berlin at INNOTRANS and one year later at TRAKO. In our

case, the situation is a bit different than that of many manufacturers, because we currently sell a lot abroad. I think that the stagnation on the Polish market resulting from the delay in the use of EU funds means that tenders are only just being announced. Not all of them have been resolved yet, and even if they are resolved, the ordering parties are waiting for funds and waiting for contracts to be signed. And I think this is the main problem.

Looking at what is happening in the entire Three Seas region, where recently we very much and actively want to look for new customers and that is where we are developing. We were at the summit in Bucharest as the Three Seas Business Forum. The willingness of all these countries to cooperate is visible – the Czech Republic, Slovakia, Estonia, Lithuania, Ukraine, Romania. And these countries are already buying. Where funds have been released, they are already buying. We're still waiting a while.

? What's next for hydrogen?

I think that the next fair will feature many, many premieres. We also continue to use hydrogen. This locomotive was the first stage. The entire propulsion system was designed so that it could be scaled and transferred to passenger vehicles. We are ▶

Maciej Grześkowiak.



Credits: Piotr Chamczyk



The new PESA hydrogen locomotive at the TRAKO trade fair.

Credits: Hermann Schmidtendorf

currently working on a passenger vehicle. We call it Pesa Regio 160 HEMU. It will be an electric vehicle powered by traction and hydrogen cells. In our opinion, and this results from hard laboratory calculations, these are the best vehicles on lines on which carriers operate today in such a way that some are electrified and some are not.

Now a diesel train runs on these lines. We propose that carriers replace it with a vehicle that can be powered by traction where there is traction and supported by hydrogen cells on other sections. And this vehicle is to be ready in 2026. It will be a REGIO 160 platform in one modular structure with the possibility of various drives. There may be a pantograph, there may be a hydrogen cell, and if any carrier on shorter, non-electrified lines wants it to be a battery, this type of concept will also be possible.

I will add one more word about hydrogen locomotives, because this one is ready. It was a very deep

and complete modernisation, but a modernisation nonetheless. Now we are working on a new project. This work has already started. We want to build another, completely new shunting locomotive on a new base, which will be prepared for homologation in Poland and Europe. Because customers ask from Sweden, Norway and Germany, so we work a little wider. And it will also be a locomotive powered by two sources, i.e. electric traction and hydrogen cells.

? What about the GAMMA locomotive platform?

The Gamma platform is already in production, further versions are being prepared, and we already have a model on display. So we are already showing what this locomotive will look like one day. It will look slightly different not only externally, but also technically. It will be delivered to customers in two or three years.

The interview was conducted by Piotr Chamczyk.

AMT:

NEW APPLICATION POSSIBILITIES FOR TWO-WAY VEHICLES THROUGH BATTERY DRIVE

The AMT Group has been operating in Breda, the Netherlands, since November 1993. First, motorcycles were overhauled. But offers in metal construction for cities and industry quickly came along. AMT is particularly active in the construction of special machines for railways and track construction. The company has represented the companies ZAGRO and ZWEIWEG in the Netherlands since 2022, and the company works across Europe.



At the railway construction congress of the Association of German Railway Engineers VDEI on November 15, 2023 in Darmstadt, AMT director Marc Weytens presented a new development. His company removed the diesel engine and fuel tank from a road-rail excavator. Air conditioning, cabin, heating and drive were modified. What's new: Four specially developed battery packs were mounted on the platform behind the driver's cab. The two-way excavator now runs electrically and has "zero emissions".

"It used to be that if a change was made, the entire machine had to be re-certified," explained ►

AMT director Marc Weytens during his lecture in Darmstadt.



Credits: Hermann Schmidendorf

Credits: AMT



A flexible charging cycle ensures continuous usability.



Credits: AMT

The battery packs have eyelets at the top for quick replacement.

Weytens. Nowadays, only the replaced parts and their influence on the existing ensemble are examined. The modernised excavator was tested extensively and certification for use on roads and rails was no problem. Road-rail vehicles are widely used. That's why the overall CO2 savings through the electric drive in these vehicles are quite considerable.

Weytens is certain: By using battery-powered two-way vehicles, construction companies protect the environment – but they also have a competitive advantage: "Now you get bonus points in tenders. In the future, combustion engines will suffer a loss or perhaps no longer be registered at all." Future bat-

tery-powered two-way vehicles will also enable the recovery of energy and have less friction. According to Weytens, the Dutch rail authority also praised the advantage of the new technology.

AMT is particularly proud of the ability to exchange empty battery packs for charged ones, thus enabling work without interruption. Two batteries are enough for work. "So you can charge two other batteries at a time." The modular and interchangeable batteries also make it possible to share the batteries with several machines in the fleet. The technology is also future-proof as newer batteries with higher capacity can be used later.

hfs

ELECTRIC TWO-WAY EXCAVATOR "AMT ZERO EMISSION"

Development partner

BAM Infra Nederland, is part of the Royal BAM Group, the largest Dutch construction company and ninth largest construction group in Europe 4x90-kWh, replaceable packs for 8 – 16 hours of continuous work

Batteries

Development partner for batteries

three different suppliers

Charging through

CCS2 fast charging connection on the machine and battery packs for charging on the machine or separately, on the construction site, at Fastned stations

Electric powertrain

new, for new machines and for retrofitting existing machines. Maintaining the hydraulic steering of the excavators.

Modular concept

Battery packs also fit in other vehicles. Two battery packs can be replaced by a fuel cell for hydrogen as an energy source.

UEEIV/RESEARCH & DEVELOPMENT
Interview

NEVOMO:

MAGNETIC LEVITATION ON CONVENTIONAL RAIL INFRASTRUCTURE

? **Dipl.-Ing. Olaf Scholtz-Knobloch:** It's about magnetic travel technology and traditional railways. Stefan, what is the innovation in your system?

Stefan Kirch: We used hyperloop technology. We were originally a hyperloop company, but we left the hyperloop idea with the vacuum tubes behind. Our vision now is to incorporate this technology into the railway. That sounds crazy at first. But we have now shown that magnetic levitation is possible in today's railways. Now we are showing a self-driving freight car that can run on the same magnetic infrastructure.

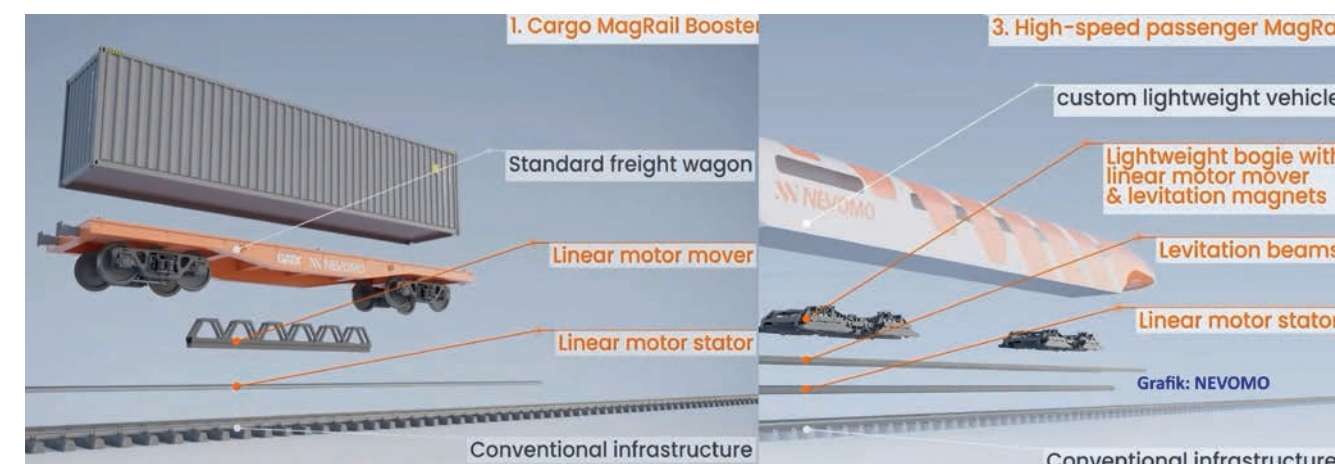
? I myself am enthusiastic about magnetic driving technology, although since my apprenticeship and even before that as a railway fan, I have always had to deal with normal, traditional wheel-rail technology. But during my studies I had a great subject called "Alternative Drives on Rail Vehicles", and magnetic technology was of course an alternative. Can you describe how your technology works? What have you adopted from the magnetic technology of the 1970s to 1990s, and what is new about your system?

We didn't invent magnet driving; many people have been doing it or trying to do it for decades. Unfortunately, many of the Maglev ideas have failed – in

my opinion always at one point. People have always tried to build a new system and ignored that a great system already exists. We have 300,000 kilometers of rail in Europe alone. Explaining to someone that they are throwing away 300,000 kilometers, including assets, will not work. Some of the old Maglev experts are now with us, including those from the Transrapid era. What we do differently is: We take components and ideas from Maglev technology but incorporate them into the railway. A kind of magnetic carpet is added to the infrastructure, so to speak. It creates a magnetic wave and we attach a kind of counterpart to the bottom of the vehicles. I also like to call it a surfboard, then it goes really well with the wave pattern, and if you have both together, vehicles can surf on the magnetic wave.

If I then add magnetic levitation – we do passive magnetic levitation – you can achieve speeds of up to 550 km/h on existing infrastructure, today's high-speed line, which is Maglev speed: i.e. twice the ICE speed on the same infrastructure. Magnetic levitation on the infrastructure will take a few more years, just from the approval procedures and safety approvals. That's why we're starting to retrofit today's vehicles, and the magnetic force ultimately supports today's railways where the railways are not good, but maintains the strengths where the railways are very, very good. ▶

UEEIV/RESEARCH & DEVELOPMENT



? I know industrial railways from my own work and can imagine that this is a great addition and that it can save a lot of operational time and effort. Do you have any concrete examples of what you imagine?

There will be two waves of deployment. One is industrial railways like you mentioned, and the second wave will be to eliminate the weakness of railways when accelerating and at high speeds. That's magnetic levitation. Many of the industrial railways cannot be electrified at all. If I have a gantry crane in a terminal or a port and lift containers onto container trucks, an overhead line would be in the way. That's why I can only take a shunting locomotive. The locomotive works well with diesel, but I always need the locomotive and the driver at the

moment when I want to do something. This means that it sometimes travels for kilometers – these are extremely poor process times, even when breaking up trains. We can do classic things like this better. Because in our world, either one of the cars can replace the shunting locomotive and push other cars around if it is already equipped with our technology. And an equipped car can also drive itself to the place where it is needed because it can swim there on the magnetic wave.

? If every car is equipped accordingly, could I drive without a clutch?

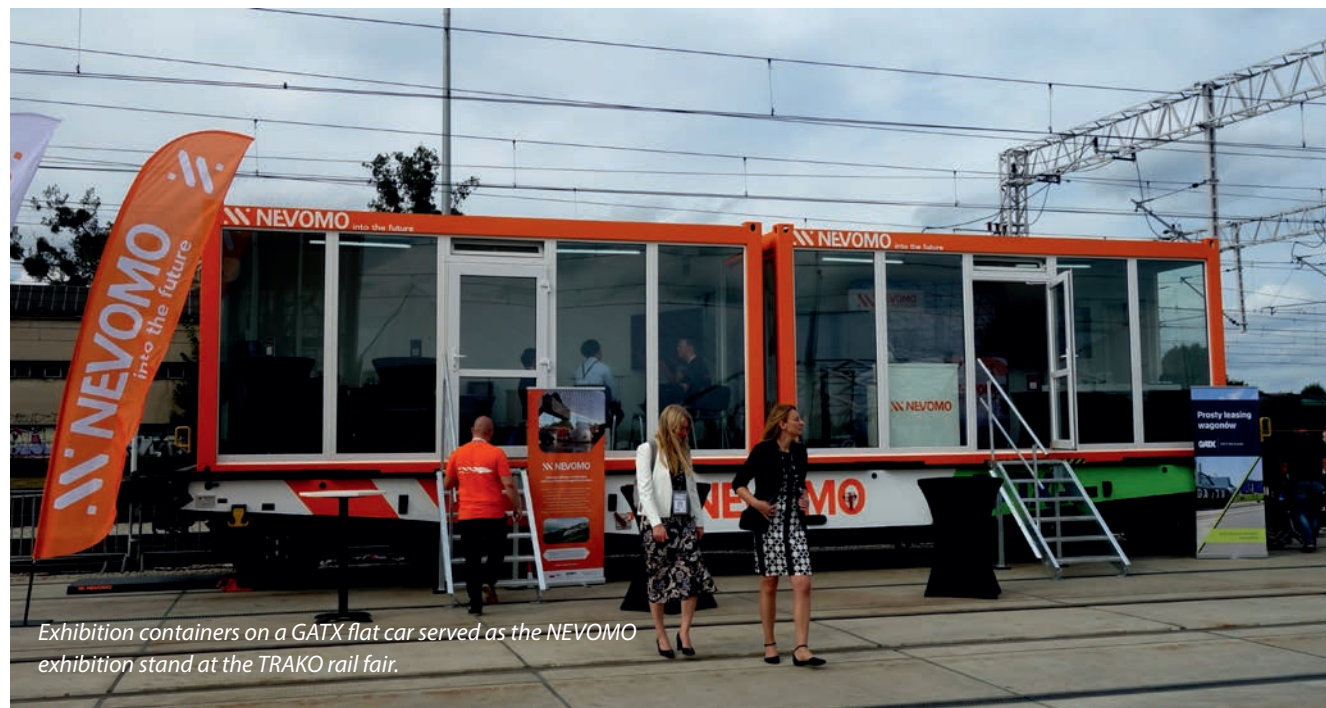
Correct! If I had equipped every car and the infrastructure was fully equipped, it actually no longer makes sense to form trains and run trains. Why ▶

At the TRAKO railway trade fair in September 2023 in Gdańsk, Poland, our magazines CARGO FREIGHT JOURNAL CFJ and rail & mobility r&m agreed to collaborate with the Union of European Railway Engineers' Associations – UEEIV. Here is the first result: Dipl.-Ing. Olaf Scholtz-Knobloch, President of UEEIV, interviews Stefan Kirch, Chief Commercial Officer & Co-Founder at NEVOMO. The graduate economist Stefan Kirch (degree in business administration from the Julius Maximilian University of Würzburg) gained his experience, among other things, in 14 years at Deutsche Bahn in various functions.



Credits: Piotr Chmarczyk

UEEIV/RESEARCH & DEVELOPMENT



Credits: Hermann Schmidtendorf

Exhibition containers on a GATX flat car served as the NEVOMO exhibition stand at the TRAKO rail fair.

should I carry out a brake test for over 90 minutes and wait for the locomotive when the car can simply drive to its destination? This applies to ports, but also later to the entire infrastructure. ? Let's assume that I were to take a coal train from Rotterdam to the Ruhr area, for example, and would have to shunt it there. If I wanted to save one locomotive, but didn't want to equip all the cars, how many cars would I have to equip to get the tractive power to pull off a complete train like that?

Let's assume that a train like this has 40 to 50 cars; coal cars are probably a little longer than container cars. About ten of the 40 or 50 cars would have to be equipped depending on the terrain of the railway line. A little more on an uphill stretch, less on a flat stretch. We calculated a case on an uphill stretch in Germany, on the Franconian Forest ramp. It has 28 per mille. Two locomotives are used there, one pushes from the back, the other pulls from the front, and we were able to show for an intermodal model that twelve cars are enough to save a complete

locomotive, so around twenty percent of the cars have to be equipped.

? That's the limit now. If you don't have such high requirements because you're not using the maximum axle load, then that's significantly less?

Yes. And the configuration not only brings the power, but also the starting speed. Where is railway good? Gliding along at 100 km/h under overhead lines. Where is the railway bad? When driving off. A freight train needs five kilometers, seven minutes to reach cruising speed. The driving dynamics of customers we already work with show that you could reach cruising speed 40 to 60 percent faster. This is a capacity booster for corridors that are currently congested. And already in this decade! The technology as we are now presenting it will be commercialized from 2024 in ports, terminals, industrial plants, and we are planning deployment on the open route from 2027 – which is tomorrow in the railways. ►

UEEIV/RESEARCH & DEVELOPMENT

? Which customers do you have in mind first? Are there already contracts?

Among other things, industry giants such as Duisport, one of the largest innovators...

? That's right around the corner from me!

...for port applications. We have GATX as a partner for the rolling stock because not only is the infrastructure needed, but also a car adjuster who provides cars. We have the SNCF as a cooperation partner for passenger and freight transport, as well as the Italian State Railways, with whom we do use cases, for almost three years. I think that's what sets us apart from other tech companies: We don't develop technology on a greenfield site and say we're smarter than 200 years of railway engineers. We are developing them with the railway engineers to eliminate the weaknesses. And that's of course great when you can work with such large railways.

? Astonishing! There are actually a lot of ideas and contacts there. How many people are you?

There are now 60 people, we're already big for a startup. You can roughly calculate how much it costs each month. But with 60 people we can do a lot. We do relatively little marketing. That's why we're perhaps not as well-known as other big names because we rely heavily on engineering. Of the 60 people, about 50 are engineers, mainly mechanical engineers, electrical engineers, but a third are already machine learning and software engineers, because our components not only have the power, but will also be intelligent digital overlay networks for the infrastructure.

! I'm excited about the future and thank you very much for the interview!

The interview was conducted by Dipl.-Ing. Olaf Scholtz-Knobloch.



Cargounit: “Several thousand locomotives in Poland need to be replaced!”

A CARGO FREIGHT JOURNAL conversation with the CEO of the leading Polish locomotive leasing company Cargounit Łukasz Boroń.

? **CARGO FREIGHT JOURNAL:** Leasing is, among other things, a financial challenge. But you are not just one of many providers, you are even a leader on the Polish market. In 2023 you celebrated your 20th anniversary at the Polish railway trade fair TRAKO, and you handed over the 200th locomotive to one of your customers, a Siemens-Vectron for DB Cargo. I guess that was a cause for special joy?

Łukasz Boroń: We celebrated a wonderful anniversary at TRAKO – 20 years of operation. We handed over the 200th locomotive with a unique painting intended to represent the 13 Central and Eastern European EU countries of the Three Seas Initiative in which we operate or in which we want to support the green transformation through railways. This locomotive shows, among other things, characteristic buildings from each Three Seas country. From Poland it is not the capital, but the Centennial Hall in Wrocław. As far as our market position is concerned, we are now number 6 in the European market in terms of the number of locomotives for rent. We operate in the second largest freight transport market in the European Union.

Few people know that Poland is the second largest market after Germany. So there are a lot of locomotives, a lot of independent transport companies, especially in freight transport. In addition, there has been virtually no modernisation of rolling stock in twenty years. From the beginning of the transformation, from 1989 and even until 2010, the railway companies hardly bought any new locomotives and

hardly carried out any modernisations. Today we are faced with a situation in which the average age of such vehicles is definitely over 30 years. That's several thousand locomotives that need to be replaced. To put it simply: If the rolling stock is around 40 years old and we need to replace 3,000 locomotives, then replacing one in 20 of them is equivalent to 5%. 5 percent of 3,000 locomotives are 150 new locomotives per year. This raises the question: who will buy and finance it?

State transport companies usually do not have the necessary financial resources to be able to afford this. Or there is quickly a lack of funds for further investments. Private new entrants to the market are typically cash-strapped, focused on opera-

A relaxed conversation partner: Cargounit CEO Łukasz Boroń with CARGO FREIGHT JOURNAL editor-in-chief Hermann Schmidtendorf.



Credits (4): Piotr Chmczyk

tions, and do not want to take on long-term debt to finance assets that are expected to operate for 30 years. They want to focus on what they do best and have the flexibility to rent. That's why they prefer to rent a used locomotive from us for 3 years or a modern locomotive for 5 years. You know exactly what the full-service model costs when renting new locomotives. And if their plans change in five years, they can give us the locomotive back and we will find another tenant.

? How did you get to the top of the industry?

Although we are a small company, we are 20 years old and have 200 locomotives but only employ 35 people. However, we have very good technical expertise and a very well-developed financial base. We have to be good with money and be able to acquire both modern rolling stock and financing and all these skills. We bundle technical expertise relating to maintenance, the purchase of rolling stock and the procurement of financing.

Personally, I have no complexes when it comes to my colleagues from the biggest Western compe-

tition. We meet regularly, we know each other, we have exactly the same business model. What sets us apart is that we are number one in the second largest market. And we won't let that be taken away from us. We have over 50 customers and long-standing business relationships. We were able to entertain almost 300 guests for our anniversary. This shows who really rules this Polish rental market!

? You have an extremely interesting mix of vehicles available for leasing. On the one hand, you have older vehicles, but they are in good condition and some have been modernised. You also give Polish producers a chance, which not all your competitors do. But you also have current types such as the Siemens Vectron, one of the most popular locomotives. How can your concept be defined?

We like to describe ourselves as a one-stop shop. Railway companies in Poland and the Central and Eastern European region require both modern multi-system and single-system locomotives as well as diesel locomotives to operate on the Polish market. Beginners often don't want to take the risk to rent a modern locomotive, which costs more

A locomotive connects the countries: the 200th cargo unit locomotive with a large motif painting.





A Vectron locomotive from Cargounit for DB Cargo.

than 200,000 Polish zloty per month. They prefer to focus on renting older, proven locomotives that cost perhaps half that amount per month. So we offered used locomotives for rent, but had different types on offer.

When purchasing electric locomotives, as a one-stop shop, we ensure that they meet the requirements of the international transport market. And here we have the Siemens Vectron with several approvals. In domestic transport, for example, we have Gama and Marathon locomotives with an access module for the Polish market, the 6-axle Dragon locomotive with an access module or Smartron shunting locomotives from Siemens for Romania. In this respect, too, we want to stay true to our motto so that our customers can find all the locomotives they need.

? Maybe a few words about the current Vectron, which was handed over to DB Cargo Polska?

As I said, we asked an artist to create a special birthday painting for this locomotive. This painting underlines the fact that we operate in the Three Seas coun-

tries, in Central and Eastern Europe, and in a way also represents a recognition of the idea of connecting the Three Seas region and the green transformation support in rail transport. Personally, I believe that rail is truly the answer to the need for environmentally friendly transport. Furthermore, it is an existing, proven solution that is very secure and does not require a lot of research and development.

«The electric locomotive is the best solution for mass transportation over medium to long distances.»

I see no justification why people should travel by car from Warsaw, Katowice or Wrocław to such trade fairs as TRAKO in Gdańsk when they could travel by train, which travels at a speed of 200 kilometres per hour or more and can accommodate several hundred people.

And secondly: I see no justification for the fact that rail transport is still subject to higher fees and taxes than road transport. This is because road traffic does not have to share in the entire cost of road maintenance. However, railway companies (freight and ►

passenger transport) must pay sufficient fees for access to the infrastructure to cover the maintenance of the entire rail network. I believe it would be worth starting the green transformation here to create a level playing field. If this level is equalised, all heavy loads between ports and larger logistics centers will be transported in containers by rail.

? This is remarkable! So you also think about transport and environmental policy?

Clear! However, the last mile can be covered by electric buses or vans that can distribute these goods to stores and individual customers. I have such a dream. We can contribute to this to a certain extent. I would like this thinking to become the guiding principle of

people influencing transport policy in Poland and Europe in order to balance the burden on road and rail transport companies. The change will take place as the government modernises the tracks and builds new tracks for rapid passenger transport.

There are companies like ours who provide rolling stock and there are private transport companies who rent this rolling stock from us and provide connections. Together it can work!

! Mr Boroń, thank you very much for the interview!

The interview was conducted by Hermann Schmidendorf.

FACTS AND FIGURES



The Polish locomotive leasing company CARGOUNIT was founded in Wrocław in 2003. Through ambitious fleet expansion, mergers and acquisitions, the company managed to consolidate its market share, expand and diversify its customer portfolio. The service offering has been expanded, ESG guidelines are being implemented, ECM fleet management and security standards have been implemented.

The company's inventory includes electric locomotives from the Polish manufacturers Cegielski, NEWAG and PESA, as well as from Škoda, Bombardier and Siemens. The portfolio also includes Soviet, Czechoslovakian and Polish diesel locomotives. According to the company's own information, Cargounit locomotives have been ho-

mologated for use in twelve countries. Customers use the locomotives primarily in the petrochemical and chemical industries, in intermodal transport and in the transport of aggregates and steel products.

On December 18, 2023, Cargounit ordered 20 additional Gama Marathon locomotives from PESA Bydgoszcz. These will be equipped with a last-mile drive and are scheduled to be delivered during 2024. Cargounit currently has 19 Gama locomotives.

On February 28, 2024, Siemens Mobility and Cargounit signed contracts to deliver up to 100 locomotives. The first contract includes 30 Vectron locomotives, which were called up immediately, and the option for 60 additional Vectron locomotives. The second contract concerns 10 Smartron locomotives. The first deliveries are planned for 2025. Cargounit is the largest customer for Siemens Mobility locomotives in Poland. With this new order, the company will have a total of 66 Vectron and 18 Smartron locomotives.

The Vectron MS locomotives ordered have an output of 6.4 megawatts (alternating current) or 6.0 megawatts (direct current). They will be equipped with an ETCS system that meets the current Baseline 3 specifications. The new Vectron MS locomotives for Cargounit are intended for use in Poland, Germany, Austria, the Czech Republic, Slovakia, Hungary, the Netherlands, Romania, Slovenia, Croatia, Serbia, Italy, Bulgaria and Belgium, among others. The Smartron locomotives are used in Germany, Bulgaria and Romania. hfs

Lolland-Fehmarn:

INSTEAD OF THE “BIRD FLIGHT LINE”, THERE WILL SOON BE A TUNNEL CROSSING

Lars Friis Cornett is Director for Germany at the Danish company **Femern A/S**. He belongs to the Danish minority in northern Germany. With his winning smile, he is the ideal person for his position because he understands the mentalities of both countries. He can really use that. His company is the general investor for the Danish state in a combined rail-road tunnel that will connect from 2029 the German island of Fehmarn with the Danish island of Lolland, 18 kilometers away on the other side of the Baltic Sea, and the ferry port of Rødby.

This is a project of European importance. The German road connection to Fehmarn and regional rail traffic have run over a bridge since 1963. Along with the opening of the bridge, a large ferry station was put into operation in Puttgarden on Fehmarn. From here, **ferries with trains and road vehicles shuttled frequently between Puttgarden and Rødby – on the “bird flight line”**. Because the route corresponded to the flight path of the migratory birds. The train station was of great importance from the beginning. A large part of the rail freight and passenger traffic ►

A cross-section of the tunnel in its final state can be seen in the information center on Rødby.



Credits (2): Hermann Schmidendorf



Work is in full swing in Rødby.

to and from Scandinavia was shipped via Puttgarden. On the Danish side, this is proven to this day by the extensive shunting facilities and eleven long shunting tracks from the time when freight trains still traveled by rail ferry. But in 2019, international long-distance rail transport and rail freight transport were finally stopped. Since then, the ferries have only transported road vehicles and pedestrians. Even high freight transport numbers – more than 11 million tons of goods were transported on the Vogelfluglinie in 2010 – were apparently not enough for Deutsche Bahn.

Now the new tunnel is intended to bring Scandinavia and the southern part of Europe together again via the shortest route – and faster than before. The basis is the **“Treaty between the Federal Republic of Germany and the Kingdom of Denmark on a Fehmarn Belt Fixed Link” (FBQ)** dated September 3, 2008. A factory the size of 140 football fields was built in Rødby, in which the tunnel segments are manufactured on site. The 79 standard elements with a length of 217 meters and ten special elements with a basement for electrical systems will be brought to the location in the Belt from 2024, where they will be lowered into the sea and connected to each other.

The maximum depth of the Fehmarnbelt is 35 meters and the **external height of the tunnel is around nine to ten metres**. Therefore, the trench must **be around 45 metres below the water line** at its deepest point. **The construction budget on**

the Danish side totals 7.1 billion euros (2015 prices), with around one billion euros in reserves. The budget is secured by Danish state guarantees. There **is funding of around 1.1 billion euros from the EU infrastructure funding program (CEF)** for the construction of the tunnel and 117 million euros for the Danish rail connection.

The new buildings on the Danish side should be used for as long as possible. This also includes a working port with a size of 500,000 square meters – twice the size of the existing port of Rødbyhavn. The materials for the construction of the tunnel elements are delivered here by ship. Later, the port and factory will be used to build the elements for other tunnels. Denmark loves tunnels. It is believed that a tunnel is a smaller intervention in nature than building bridges. And the newly created land area will be used as a nature and recreational area. Several thousand people will be employed in the concrete factory for the tunnel elements alone.

Tunneling is a great machine for stimulating the economy. The investment is said to have paid for itself after 28 years. Denmark then hopes to make a steady profit from the toll revenue. Trains will only take seven minutes to travel through the tunnel. The tunnel and its systems are powered by green electricity. It will be **a tunnel of superlatives: the longest immersed tunnel in the world, the longest and deepest road-rail tunnel in the world.** hfs

DB InfraGo: Travel times from Copenhagen to Hamburg will be halved

When it comes to building the Fehmarnbelt fixed link, the division of labour is clear. Denmark is building the tunnel and its own hinterland connection, Germany is responsible for the German hinterland connection from the tunnel exit on the German island of Fehmarn. Jutta Heine-Seela is Head of Technology at DB InfraGo and is specifically responsible for northern infrastructure projects such as the Fehmarn Belt Fixed Link (FBQ) rail connection. CARGO FREIGHT JOURNAL spoke to the degreed engineer on the construction site.



DB InfraGo is building from the exit of the Fehmarn Tunnel on the German side near Puttgarden: here is the construction status as of October 2023.

Credits: Femern AS

CARGO FREIGHT JOURNAL: Ms. Heine-Seela, what will happen here in the coming years on Fehmarn and beyond?

Jutta Heine-Seela: We are connecting the later Danish tunnel under the Belt, i.e. the Fehmarn Belt fixed link, to the German rail network. We are starting our expansion of the route on Fehmarn in the Puttgarden area and going to Lübeck, thus closing the corridor between Copenhagen and Hamburg. That's 88 kilometres of track construction and earthworks. We have to build a lot of road bridges

because of course we also cross a lot of streets. The level crossings that exist today will all be removed. We take care of noise and vibration protection. We have a lot of noise protection measures here, noise protection walls, and can also implement supra-legal noise protection. We will build seven new train stations on the so-called Vogelfluglinie, the bird flight line, as the route has been called for years, and we will also design these stations, in such a way that they are recognisable. Today the existing line is only single-track and not electrified. Later it will be electrified and double-tracked. ►

? Since the Danish rail network has a different traction current than Germany, where is the exact point at which the Danish and German traction currents come together? Will the system change be a transition while driving or while standing?

In driving there is switching from one system to the other, and it will take place right here on the island of Fehmarn. When the Danish tunnel reaches daylight, it is around 250 meters and we reach the transition area for both the overhead line technology and the control and safety technology. Everything that is different between the individual systems is transferred in this area in driving.

? You will also install the European security system ETCS, what level will that be? The Danes will also expand their tunnel connection accordingly?

ETCS level two without signals is planned for the entire route. We won't have any signals here later. At the moment, through the project we are equipping the route just before Lübeck, up to the city limits, with ETCS, and the gap will then be closed in other projects. As far as I know, a gap closure is also being carried out on the Danish side. This is about the double-track expansion and electrification of the railway line between Vordingborg and the Storstrømsbroen bridge and between Orehoved and Rødbyhavn. We also have a rail connection to the hinterland. An immersed tunnel still needs to be

built parallel to the Fehmarnsund Bridge.

? What is the schedule for the implementation of the plans?

We want to go into operation at the end of 2029. This is the same goal that the Danes have. It is certainly ambitious. But it's still a few years away. We're doing everything we can to ensure that we're finished then, and we think we'll get there. The top speed is between 160 and 200 km/h. In the first area, from Lübeck to Bad Schwartau, we are traveling within a quasi-urban area. This means that you cannot carry out the route as needed for 200 km/h.

? This actually gives a clear advantage in terms of time.

In any case. We will reduce travel times, whether in local rail passenger transport or long-distance transport, by around half, and freight transport will of course also be faster. Today freight trains have to take the other route, the so-called Jutland route. It's much longer. Of course, freight traffic will then travel faster on the route from Copenhagen to Italy.

! Thank you very much – we wish you good construction work without any accidents!

The interview was conducted by Hermann Schmidendorf.

Loud blast of compressed air at the start of German construction work: The noise was made from the left by DB Infrastructure Board member Berthold Huber, Federal Transport State Secretary Susanne Henckel, Schleswig-Holstein's Prime Minister Daniel Günther and Philippe Chantraine, representative of the European Commission's Directorate General for Mobility and Transport.



Credits (2): Hermann Schmidendorf

S-Tog Copenhagen:

FULLY AUTOMATED

On April 3rd, the Copenhagen light rail (S-tog København) celebrated its 90th anniversary. In order to meet the ever-growing demands on the city rail, all 135 S-tog trains are currently being modernised by 2028. In 2023, DSB had already equipped 38 trains with new colours and new upholstery inside and out and installed a digital information system. The next, massive leap towards the future: Siemens Mobility will upgrade the entire 170 kilometre long Copenhagen S-tog network to the highest level of automation (GoA4). Driverless train operation on the Ringbanen should be possible as early as the first project phase in 2030. Corresponding contracts for the necessary signaling technology for trains and route equipment were signed with BDk and DSB on April 24, 2024. The delivery includes onboard units for 226 new trains. The implementation will take place in five phases and end with fully automated operation from 2033.

Another decision was made on April 10, 2024. The providers Siemens Mobility and Ground Transportation Systems Denmark have prequalified for the contract to supply support systems for the automation of the S-tog. The Supporting Systems package includes a number of technical components such as cameras for platform monitoring, emergency stop mechanisms and the development and deployment of a sophisticated system for detecting people and objects on the tracks. The contract for the "supporting systems" is to be awarded by the end of 2025.

The parent company Danske Statsbaner DSB also ended 2023 positively. There were a total of 162 million trips – an increase of nine percent compared to 2022. In the first two months of 2024, seven percent more travelers were carried than in the previous year. Despite challenges such as a snowstorm in early January and numerous construction work on the railway



The interior of the new DSB EC trains.

Credits: Talgo

lines, punctuality in long-distance and regional train traffic exceeded the target of 75 percent at 81.3 percent in February 2024.

By 2027, DSB is to receive passenger coaches for 16 locomotive-hauled EC trains from the manufacturer Talgo. The first set of Talgo 230 trainsets arrived in Copenhagen for testing on January 25, 2024. The EuroCity trains are pulled by Siemens Vectron type EB electric locomotives. The trains, each with a capacity of 492 passengers, will operate at speeds of up to 200 km/h on key cross-border routes including Copenhagen – Hamburg and Aarhus – Hamburg. DSB's EC cars are similar to the ICE L vehicles for Deutsche Bahn (DB), which are expected to begin service on the Berlin – Amsterdam routes at the end of 2024, among others.

Train maintenance in Denmark, however, is increasingly being outsourced. On September 1, 2022, the Munich company Knorr-Bremse took over the DSB Component Workshops. Their specialisations include overhauls, for example of bogies, repairs and the supply of parts and components for subsystems for trains, wagons and locomotives. Knorr-Bremse integrated the company with around 400 full-time employees at five locations in Aarhus and Copenhagen into its international RailServices network. Rolling stock from Sweden and Norway, for example, will also be served here. In contrast, the Finnish workshop company VR Fleet-Care signed a maintenance contract with the Danish rail operator Nordjyske Jernbaner A/S on April 17, 2024. Initially until 2029, the company will carry out maintenance of bogies and pneumatic components for Alstom Coradia LINT series trains at its own locations in Helsinki and Pieksämäki.

hfs

Railway in the Kingdom of Denmark:

LOTS OF ISLANDS, LOTS OF BRIDGES AND TWO TUNNELS

There is a yellow signal box in the Danish Railway Museum Gedser, 45 kilometres as the crow flies from the German island of Fehmarn. In 1975, the most profound railway-philosophical dialogue in rail history took place in this wooden building called “Det Gule Palæ”.



The brilliantly restored freight car “Franz Jäger Berlin” (DSB Gklm) stood in front of the famous yellow signal box “Det Gule Palæ” from the Olsen Gang film on July 26, 2022.

Credits: Bendix Jensen on: www.olsenbandenfanclub.de

Signal box manager Mr. Brodersen: “The G 3745 to Roskilde, Glumsø and Næstved punctual to the minute. I have to tell you, my dear Mr. Gotfredsen, it’s always like a miracle for me. God bless you, in a world like this it’s good to deal with things that always work. They are subordinate to a higher power, like busy ants in a well-thought-out system.”

Signal box colleague Mr. Gotfredsen: “You’re absolutely right, Mr. Brodersen. And now the coffee is ready.”

Back then the world was still in order! At least in the Danish comedy film “The Olsen Gang sets the course”, which is still popular today. A lovable group of scatterbrained petty criminals, the Olsen gang, wanted to hijack a “Franz Jäger Berlin” freight car full of gold bars and deliberately messed up the perfect clockwork of the Danish state railway DSB. Hilarious! In the meantime, the signal box building at its not only film-historical location in Copenhagen had to give way to construction work. But in 2016, film fans from Denmark and Germany, together with sponsors, financed the relocation of the 30-ton object to the railway museum on the Danish island of Falster, 130 kilometres away. And in 2022, three trainee industrial mechanics from Havelländische Eisenbahn AG converted a Danish freight wagon into a “Franz Jäger” wagon in great detail as their journeyman’s piece. What is the saying in the Olsen Gang film? “Mighty massive” – tremendously good!

Many islands, many ferries

The geographical location of the Kingdom of Denmark is characterised by its proximity to the North and Baltic Seas and its division into several islands. A land connection only exists between southern Jutland and the duchies of Schleswig and Holstein, which were ruled by Denmark at the time the railway was developed. The formation of a coherent railway system throughout the country was initially impossible. The first Danish railway was built in 1844 outside of today’s Danish territory between the now German cities of Holstein and Kiel.

The first railway line on what is now Danish land was opened in 1847 with a length of around 30 kilometers between Copenhagen and Roskilde. In 1856 it was extended to Korsør. These and other rail-



Truly centrally located: the Copenhagen Central train station.

way lines were built with the participation of private capital. A coexistence developed between private railways, in which municipal institutions were often key investors, and the state. In 1867 the state took over the operation of the railways in Jutland and Funen. The Aarhus-Fredericia (1868) and Randers-Aalborg (1869) lines became the first state-built railway lines in Denmark. In 1885 the Danske Statsbaner DSB (Danish State Railways) was founded. The result was a coexistence: the main lines were run by the state, the branch and branch lines remained in private, municipal hands.

In order to bring together the railway network between the country’s most important islands of Zealand, Funen, Lolland, Falster, Bornholm, Mors and Langeland and the mainland, connections with railway ferries were initially established. The first steam ferry connection Fredericia-Strib was built in March 1872. It connected the state railways in Jutland and Funen. This was followed in 1883 by the connection of the Zealand and Funen railway networks by the Korsør-Nyborg ferry connection across the Great Belt, and in 1884 by a ferry connection across the Masned-sund between Zealand and Falster. At the end of the 1880s, the state railway network comprised 1,519 kilometres of railway lines.

The Danish state actually wanted to further expand the railway network in its own country. But the needs of the neighbours required a change in the plans, Baron von Röhl reported in his 1912 encyclopedia of railways. The German company “Deutsch-Nordischer Lloyd” had built the Neustrelitz-Warnemünde railway in Mecklenburg, Germany, and set up a daily steamship connection between Gedser in Denmark and Warnemünde. This created the fastest connection between Copenhagen and Berlin, which also met Swedish transport needs. In 1892, Denmark established the steam ferry connection Helsingør (Denmark)-Helsingborg (Sweden). The Copenhagen – Malmö ferry connection followed in 1895. In addition, the state took over the operation of the Orehoved-Gedser line in 1893, and in 1903 the Gedser-Warnemünde ferry connection was opened together with the Mecklenburg Friedrich Franz Railway. In 1912 the state railway network was 1,951 kilometres long. The 44 private railways that existed at the time had a network length of 1,701 kilometres.

Bridges improve rail traffic

It quickly became clear that, despite the associated costs, the construction of bridges would be necessary. In 1879 the Limfjord railway bridge ►



Many bridges and soon a new tunnel: rail transport between Denmark and neighbouring countries.

between Aalborg and Nørre-Sundby was put into operation. Then in 1884 the Masnedssund swing bridge between Zealand and Masnedø was put into operation. It was replaced in 1937 by a single-track combined rail/road bridge with a bascule function and continued over the Storstrøm Bridge to the island of Falster. In 2018, in connection with the construction of the fixed Fehmarnbelt connection, a new double-track railway bridge was built in place of the Masnedssund Bridge, parallel and immediately east of the old bridge. It allows passenger trains to travel at speeds of up to 200 km/h. Another important railway crossing is the two “Little Belt Bridges” (Lillebæltsbro) from 1935 and 1970 between mainland Europe, the Jutland peninsula, and the Danish island of Funen. Also important are the King Frederick the IX Bridge between Falster and Lolland, the Odde-sund Bridge in northern Jutland and the Great Belt Bridge – Storebæltsbroen – opened in 1997 between the islands of Funen and Zealand.

The most striking connection between two countries in Northern Europe is the Øresund crossing between Copenhagen in Denmark and Malmö in Sweden, which was inaugurated in 2000. It consists of a 4 kilometre long tunnel, an equally long stretch

on the artificial island of Peberholmen and an 8 kilometre long bridge. The transition between the Danish and Swedish versions of the ATC train control system takes place on Peberholmen. The train current change takes place on the Swedish headland in the Øresund in Lernacken. In Denmark, trains run with 25 kV, 50 Hz traction current, in Sweden and Germany with 15 kV, 16 2/3 Hz. Between 2019 and 2032, the Øresund Bridge is scheduled to receive a new coat of paint for around 43 million euros. At Malmö, the trains also switch from the right to the left track – in Sweden, trains run on the left, like in Great Britain.

The Øresund trains, known as ET in Denmark and X31K and X32K in Sweden, were put into operation in 2000 specifically for Danish-Swedish rail traffic. Between 2000 and 2012, Bombardier Germany (formerly ADtranz) manufactured 111 trains based on the Flexliner family in Hennigsdorf and Görlitz with a top speed of 180 km/h. Like the DSB’s MF diesel multiple units, they have a rubber bulge at the wagon transition, so they are a “rubber nose” (see our article about the DSB vehicles). But both series cannot be coupled with each other. The train sets run via Malmö to Gothenburg, Kalmar and Karlskrona. Until December 2017, the Øresund trains were also called Inter- ▶

City Bornholm from Copenhagen Central Station via Svedala and Skurup in Sweden to Ystad, from where the fast ferry to Rønne on Bornholm could be taken.

The DSB is not alone

Today, in addition to the state railways, private and foreign railways have long been active on Denmark’s railways. In passenger transport these are Arriva, Flixtog, Lokaltog, Midtjyske Jernbaner, Nordjyske Jernbaner, SJ AB and Snälltåget. Freight transport only exists outside the DSB – offered by the operators C Rail Safety, CFL Cargo, Contec Rail, DB Cargo Scandinavia, Green Cargo, Hector Rail, Spitzke Danmark and Tx Logistik. In 1996 the rail network was separated from the DSB and transferred to an independent state company, today’s Banedanmark. The Danish statistics office Danmarks Statistics put the extent of the route network at a length of 2,610 kilometres as of January 1, 2023. The state route network managed by Banedanmark (BDK) amounts to 1,962 kilometres. Of these, 802 kilometres were electrified. The 171 kilometres long light rail network (S-tog) around Copenhagen is also electrified. With the foothills in the region, it now reaches a fifth of the Danish population. In the S-tog’s core network, up to 84 trains per hour run on seven lines, carrying around 350,000 passengers every day. The operator is DSB, the infrastructure belongs to BDK. The S-train is a great success with 106 million customers per year at a total of 88 stations. Punctuality was historically high at 95.9 percent

in 2023. The rate is measured by the percentage of customers who arrive within 2 minutes and 59 seconds of the scheduled arrival time. Since its founding in 1934, the Copenhagen S-tog has been running on direct current with a voltage of 1.65 kV and regular overhead wires.

Just quickly to Malmö: The Øresund train commutes between Copenhagen and Sweden.



Attention train traffic! The logo of Danske Statsbaner DSB since 2014.

Credits: DSB

For the electrification of the Danish main line Helsingør–Copenhagen in 1986 and later the other routes, the decision was made in favour of alternating current at the national grid frequency of 50 Hz with an operating voltage of 25 kV. Why? After all, in Sweden and Germany the railways are electrified with alternating current 15 kV 16.7 Hz. Whether in France, the Czech Republic or Japan, the 25 kV system is widely leading and is considered the most modern form of traction current. Denmark’s decision-makers concluded that it is also the cheapest system because a separate traction current does not have to be produced from the national network. In contrast, the additional costs would be comparatively low if some multi-system locomotives were to be purchased for cross-border transport.

Between 1984 and 1993, DSB purchased 22 electric locomotives from the EA series for electrified operations. The first two locomotives came from Henschel Kassel, the subsequent units from Scandia Randers. Siemens Erlangen and BBC were also involved in the creation. The basis was the 120 series from Deutsche Bahn. The latest orders for electric locomotives were placed with Siemens Mobility and Alstom Germany.

Good infrastructure, good trains – this is how Denmark’s railways should get back into top shape. Just as the little crook Egon from the Olsen gang once praised in the film: “I have a plan. And not an ordinary plan, but a timetable. I don’t know of any other company where everything is as well thought out as the state railway. Everything runs on time, to the minute. Everything is planned precisely.”

Hermann Schmidtendorf



Credits: Hermann Schmidtendorf

ROUND NOSE IS TOP, IC4 A FLOPP – NOW PROVEN LOCOMOTIVES SHOULD STABILISE THE RAIL TRAFFIC

Immediately after the Second World War, Denmark's railway decision makers took their time. Proven steam locomotives from the country's own production were not very economical or powerful, but they still ran. So it was carefully considered which diesel locomotives should replace steam traction. Immediately before the war, Denmark had achieved a leading position in the construction of diesel engines. But there was uncertainty about the question of whether these engines would guarantee the endurance and operational safety required for rail operations. As a result DSB's first diesel locomotive came from Sweden – a licensed replica from the USA.

The so-called round noses were created under license between General Motors and the Swedish company Nydquist & Holm Aktienbolag (NOHAB). More than 7,000 examples of this type had already been produced in the USA in the early 1950s. For Denmark, the model was modified from a 4-axle vehicle to a 6-axle vehicle. The engine, main dynamo and traction motors came from General Motors. From the second ex-

ample onwards, the Danish company Frichs A/S was able to supply the majority of the mechanical components. The first four locomotives were delivered in 1954 and classified as MY 1101-1104.

The test drives under various loads and weather conditions exceeded expectations. By 1965, a total of 59 of these locomotives had been purchased, which, among other things, ran on the Nyborg and Frederikshavn main lines. By 1962, 45 six-axle modifications of the MX series (Danish Litra) were also purchased for use on branch lines, the axle pressure of which was reduced to 16 tons. 35 percent of the production volume was guaranteed to Danish suppliers.

The last diesel locomotives for the Danish State Railways' line service were built between 1981 ►



Visiting the neighbour – a “rubber nose” on May 22, 2018 at Hamburg Central Station.

Credits (2): Hermann Schmidtendorf

and 1985: 37 units of the ME (II) series with diesel-electric power transmission. Here it was a locomotive that was technically closely related to the Di 4 of the Norwegian State Railways, built by Henschel Kassel, BBC Mannheim and also built for the DSB by Scandia, which had proven itself in Norway's cold.

Between 1965 and 1984, the local municipal railways represented in Denmark's regions procured 75 railcars, 18 intermediate cars and 55 control cars, which were built by the Uerdingen wagon factory (today Siemens) with final equipment from Scandia. Uerdingen designed the prototype at its own expense and tested it on DB routes as the 791 series. The Danish name was Y-tog (Y-train), because the company numbers of the vehicles on the local railways start with Y, or colloquially Lynette (small lightning bolt). At the same time, between 1978 and 1985, Uerdingen and Scandia AS, Randers, built 98 double units of the MR/MRD diesel multiple units, a modification of the German BR 628.

The 92 three-part MF (II) diesel multiple units from the manufacturer Scandia Randers built for DSB between 1989 and 1998 for national transport proved to be just as reliable as the Y and MR/MRD trains. They are also referred to as IC3, the four-part further development as an electric multiple unit as IR4. Their characteristic feature is a rubber bead that keeps the car transition draft-tight. The bulge gave the trains the nickname “rubber nose”. It encloses a driver's cab that can be folded away and converted into a passageway. In this way, a maximum of five IC3 or IR4 units can be coupled to form a continuous train. Several units are connected via automatic Scharfenberg couplings with side contact attachments. The MF trains also offered comfortable connections between Hamburg Central Station and the Danish heartland for many years.

Local Scandia went bankrupt, Italian new trains sank into the “morass”

But in 2000, the key people at DSB set the course on the wrong track. Instead of relying on proven suppliers and contractually involving the local industry as suppliers, they settled on the Italian manufacturer AnsaldoBreda as the supplier of new trains after a Europe-wide tender. Result 1: The most important Danish rail supplier Scandia Randers, Bombardier Transportation Denmark since 2001, had to close



Two Y multiple units in the Lokalbansen workshop in Harlev.

in 2014. Result 2: The ordered trains arrived after years of delay, proved to be structurally defective or unsuitable for operation and are still a heavy burden on the Danish railway system today. “A quagmire!” said the Randers Amtsavis editorialist caustically. He blamed “incompetent Danish politicians and officials, together with the equally incompetent Italian AnsaldoBreda”.

Ansaldo delivered the first of 83 ordered examples of a four-part diesel-mechanical long-distance train of the type MG, also called IC4, to Denmark in 2003. However, due to constant defects, the first passengers could not be transported on these trains until September 2010. The defects could not be remedied, so that some of the trains were taken out of service and some were scrapped as early as 2017. With the two-part diesel-mechanical long-distance multiple unit DSB MP (IC2) from Ansaldo, the problems were even greater – they came into any stable daily operation. Therefore, all 23 IC2 sets were shut down on August 23, 2016.

The Danish Transport Minister Ole Birk Olesen drew the temporary end to the mismanagement on June 15, 2017. “In the future, the DSB will acquire a product – and not a project!” he emphasised in fyens.dk. And that means: For the future of the increasingly electrified Danish railways, tried and tested electric vehicles will be purchased. Currently these are mainly Siemens Vectron locomotives and Coradia multiple units from Alstom.

Hermann Schmidtendorf

VDEI-network:

DANISH-GERMAN RAIL TRANSPORT MUST IMPROVE

Until the 1980s, rail traffic from Germany to Denmark was uncomplicated. Denmark was a pure “diesel country” (except for the S-Bahn network in Copenhagen). And in Denmark you could drive up to $v_{max} = 140$ km/h without any train control systems. This meant that multiple units temporarily used by the DB and DR (VT08 as the “Copenhagen Express”, VT18.16 – Görlitz design as the “Neptune”) were able to travel to Copenhagen without any problems.

The equipping of Danish railway lines with a train control system only began in 1988. The decision was made to use the ZUB 123 system, which enables a maximum speed of 180 km/h. The order went to Siemens. It is a point-shaped train control system. Track coupling coils (transponders) are mounted on the outside of the track without their own power supply, which influence a vehicle resonant circuit tuned to 50 kHz. In DK, like in Sweden, this system is called ATC (Automatic Control System), although it is incompatible with the Swedish ATC system.

For cost reasons, after the electrification of the Hamburg – Padborg – Fredericia railway line, “diesel under contact wire” dominated long-distance traffic to Jutland. The DB Fernverkehr used the German diesel ICE train of the 605 class, which was not used because the tilting train technology did not work. Every ICE TD was converted to the Danish ATC and INDUSI systems at German rail’s expense with additional electronics with cables stretching for kilometres. The experts even had to deal with installing holders for coffee cups and thermos flasks for the train drivers according to Danish standards.

Summer 2023: worsening crisis in local and long-distance transport DB – DSB

The only stable operation at the moment is cross-border regional rail traffic from Esbjerg via Tøndern to Niebüll. This route is equipped with the Danish ATC up to the German border station. In Denmark the line to Tøndern was put out to tender in competition.

The winner was Arriva who made an attractive offer to the authority in Schleswig-Holstein for operations between the border stations. The rail infrastructure from Niebüll to the state border is no longer state owned, but is operated by the private Norddeutsche Eisenbahngesellschaft (NEG).

Today, Flensburg is left behind in long-distance transport. All IC trains to Denmark pass Flensburg without stopping from Schleswig to Padborg. Since summer 2023, DSB’s diesel multiple units have been replaced by locomotive-hauled trains. The trains are pulled by a Danish Vectron locomotive with older DB IC wagons. There is no bistro car or minibar service for the long journey. In Padborg, the supermarket chain “Seven Eleven” distributes a cup of tea or coffee and a pack of water with a bread roll.

During a VDEI excursion with 27 participants from Berlin on Sunday, September 17th, 2023, we witnessed current problems ourselves. On our neighbouring track (we were heading towards Rødby) the last IC to Hamburg waited at around 4 p.m. with an overcrowding of around 110 percent. 30 minutes after the scheduled departure, the passengers were informed that the train was defective. An alternative travel option to Hamburg was not offered.

Similar incidents are increasing. As we learned, on August 3, 2023, after a two-hour delay, all travelers had to leave the IC to Hamburg at the Padborg border station without explanation. Five replacement buses arrived successively after midnight, but around 100 passengers had to spend the night at the train station. Various technical difficulties are accumulating that were not initially thought of, for example due to the 20 protective sections to Padborg in the Danish overhead line system.

Dr. Jürgen Murach, Vice President Association of German Railway Engineers VDEI, head of the VDEI network “Europeanization of Railways”



Credits: Hermann Schmidendorf

Danish trains only for domestic purposes?

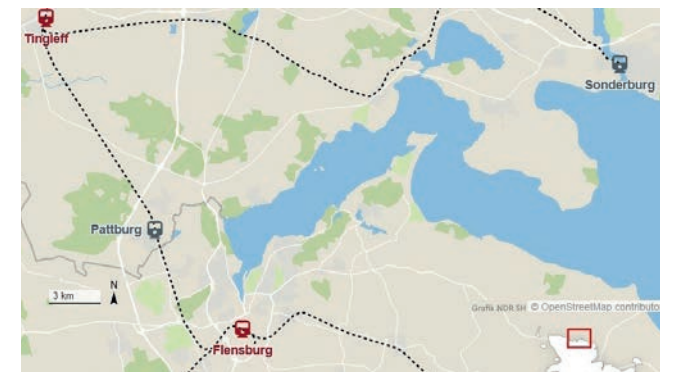


Credits: Hermann Schmidendorf

In 2021, Denmark’s state railways DSB ordered 100 new Coradia Stream electric multiple units from Alstom Germany for the Fredericia - Tinglev - Sønderburg/Flensburg route. It was only in the summer of 2023 that it became clear: These trains, called IC5, should not be able to run under traction current from several countries, including Germany. Instead of Flensburg with almost 100,000 inhabitants, only Sønderburg (28,000 inhabitants) should be served, although the traffic connections to the neighbouring region are very high (commuters, tourists, Danish minority). In the meantime, Schleswig-Holstein has also ordered Coradia Stream trains from Alstom through its transport company NAH.SH – but also with Danish technology in order to be able to at least connect the RE7 regional line from Hamburg to Tinglev, where the connection to the Danish rail network then takes place. **CARGO FREIGHT JOURNAL discussed the issue with the Schleswig-Holstein transport minister.**

? **CARGO FREIGHT JOURNAL:** Minister Madsen, I am a big fan of the Fehmarn Belt Tunnel. But now Denmark has aligned its procurement policy for vehicles so that they can technically only be driven in their own country. That would mean that we would have to constantly change trains at the borders with Germany, whereas previously it was possible to travel comfortably on the Danish train to Hamburg. Do you still see an opportunity for change?

Claus Ruhe Madsen: I have of course spoken to the Danish Transport Minister about this for a long time. Fortunately, we were able to at least agree on



Credits: Hermann Schmidendorf



The minister with a new battery train.

a Denmark option with him for our own new trains that are coming from 2028. This means that 23 trains will be equipped to travel to Denmark. But in fact we will also have this issue with the Fehmarn Belt crossing. I think in the end it will turn out that we will find systems where you can drive in both countries. There are still a few years left. Nevertheless, these discussions must be held now.

? **It seems you are the best possible conversation partner for such negotiations?**

A leg there, a leg here in the language at least, otherwise I’m completely from Schleswig-Holstein, and my Danish colleague also knows that. And of course I represent the interests of Schleswig-Holstein and Germany, he of Denmark. But we still have to find a common way for more public transport.

The interview was conducted by Hermann Schmidendorf.

Conference:

SCANDINAVIAN RAIL OPTIMISATION STOCKHOLM | 6TH NOVEMBER 2024

This may it was the sixth time we've organised in Germany the event The Rise of IoT & Big Data in Rail. It originated back in 2018 and started off as a relatively small regional event. But this year, we've now grown the event to our highest attended audience, attracting not just operators, infrastructure managers and suppliers from Europe, but the event is now become a truly international.

This year we've had operators from the Indian Railways, the American Railways, Saudi Arabia, Australia, South Africa, to name just a few. So thankfully **the event is grown in reputation and it's attracting a wider audience.** Obviously that's good for our sponsors who take part here as that's who they're looking to work with these types of organisations. But on the flip side, for the operators and for the infrastructure managers that attend from all around the world, they're getting to meet the latest digital innovators who can help them with their sort of digitalisation journey that they're currently going on.

Presentations, panel discussions, networking

The focus of the conference is presentations and panel discussions where people get to sort of share their views and opinions. We also have the round-table discussion groups. But **the networking opportunity is arguably the most important point**

throughout the event. We as an organiser actually set up personal meetings with the actual suppliers and the operators during these networking breaks. So we maximise their time at the event and ensure that they get as much value from participating as well. And that obviously follows through into the drinks reception that we have at the end of day one, and also the networking dinner, which was good fun.

Daniel McGregor from nexxiot has been a client of mine for several years. He's a very charismatic chap. And thankfully, he very kindly offers to chair the event. He adds a lot of value bringing the conversations to life.

The next conference to invite is the Scandinavian optimisation. **The Scandinavian event is taking place on the 6th of November in Stockholm once again.** It's a very similar format and topic to this event here in Germany. But as the name of the event suggests, it's much regionalised. It's a case of bringing together the Swedish, Norwegian, Danish, Finnish, as well as the Baltic Railways to basically talk about how they're harnessing the latest digital trends and helping them to increase capacity, improve reliability, haunting availability, as well as helping to reduce their maintenance costs. It's a very similar format to the German event and very similar focus. **For people or organisations that are operating or are interested in operating in Scandinavia, it's obviously a key event for them to attend.**

We even had one operator speak in Cologne from the Nordic region, who highlighted, obviously where it's very cold in that region, they have issues with freezing, whether it's on the track, whether it's the trains, and obviously certain digital technologies are required to overcome the challenges and the problems that they face in that region. So for companies who offer those particular specialties and products, it's a very key event for them to attend so they can assist their potential partners and potential clients.

Ben Holliday

Ben Holliday was Head of Sales for the specialist publication Global Railway Review from 2005 to 2017. Since then he has been the founder and managing director of the event company ROTAIA. Impresario of Europe's leading conferences on IoT and Rail.



Credits: Hermann Schmidtendorf

NEWS · BUSINESS PERSONALIA

ALSTOM IS FIGHTING FOR ORDERS AND JOBS

PERSONALIA:



Credits: Arnaud Février-Alstom/P.P.
Stays as CEO:
H. Poupart-Lafarge



New BoD: P. Petitcoin

On 12 March 2024, the Alstom Board of Directors co-opted **Philippe Petitcoin** as independent Director to replace **Jay Walder**. The ratification took place at the Annual General Meeting of 20 June 2024, which also approved the renewal of his term of office as Director and the appointment of Jay Walder as Director, in both cases for a 4-year term. On that date, Philippe Petitcoin assumed the duties of Chairman of the Board of Directors, **Henri Poupart-Lafarge** continuing to be in charge of the executive management of the Company. Petitcoin is a former CEO of Safran SAF.PA.

PERSONALIA:



Credits: Alstom

Alstom announces the appointment of **Aymeric Sarrazin** President Digital & Integrated Systems, effective 1st February 2024, replacing Jean-François Beaudoin, who has decided to pursue his career outside of Alstom. Sarrazin will report to Alstom CEO and Chairman of the Board of Directors, Henri Poupart-Lafarge, and will be part of the Alstom Leadership Committee. He will be based at Alstom's headquarters in Saint-Ouen, France.

NEWS:

With the takeover of the railway division of the Canadian Bombardier Group in January 2021, Alstom wanted to take advantage of the great opportunities that arise from its position as the second largest railway manufacturer after the Chinese CRRC on the European and global markets. But the integration of both parts of the group is more difficult than expected. In 2022, the French company encountered unexpected risks in old contracts, announced provisions of up to 2 billion euros and attempted to renegotiate the purchase contract in arbitration proceedings.

In November 2023, the group announced the reduction of approximately 1,500 jobs and the sale of assets and was considering a capital increase to achieve its confirmed medium-term goals. In Great Britain, the continued existence of the Alstom factory in Derby, the most traditional core of the British rail industry, is in danger. The factory had recently been preparing for orders for the British HS2 project. But the next high-speed orders are not expected to arrive until 2026. After nerve-racking negotiations with the Transport Minister, it now seems possible to secure the Derby plant for the time being by building ten additional trains for the Elisabeth Line.

In Germany, the preservation of jobs depends heavily on the tender, currently worth twelve billion euros, for two-thirds of the Berlin light rail system. Alstom is suing against the award to a consortium of Siemens, Stadler and Deutsche Bahn – its own offer is more economical than that of its competitors. The responsible court only partially ruled in favour of Alstom on March 4, 2024, but further legal disputes are likely. The works councils fear for the existence of the Hennigsdorf, Bautzen and Görlitz locations. *hfs*

PERSONALIA:

On April 9, 2024, the supervisory board of the technology group Siemens announced the extension of the contract for CEO **Roland Busch** by five years from April 1, 2025. It is also planned to extend the mandate of board member **Cedrik Neike** by five years in June 2025, when the current contract expires. Neike heads the Digital Industries division.

Credits: Hermann Schmidtendorf



PERSONALIA:

Henrik M. Egeter, previously Vice President Sales at Vossloh Rolling Stock GmbH, took over the position of Managing Director and CEO on April 8, 2024. Henrik M. Egeter brings extensive experience from various management positions at Knorr-Bremse Powertech, Grammer, DB and Stadler, among others. Dr. Bernd Hoppe, the current CEO, will be available to the company as a senior advisor until the beginning of next year.

Credits: Vossloh Rolling Stock GmbH



Depot and service network:

A DATA-DRIVEN APPROACH TO TRADITIONAL LOCOMOTIVE MAINTENANCE

Credits: Siemens Mobility (9)



By Stefanie Carle, head of services for locomotives and passenger coaches at Siemens Mobility Rail Services

From the Arctic Circle to the Mediterranean, from the Black Sea to the Atlantic: Every day, Vectron locomotives from Siemens Mobility crisscross Europe, delivering freight and passengers efficiently. At any given time, some 2,000 Vectron locomotives are in operation, collectively clocking up millions of kilometers a year. However, even the most dependable locomotives require proper maintenance to ensure a long service life and continuous uptime.

The Siemens Mobility Rail Services promise focuses on 100% system availability, and that requires a dense network of locomotive workshops. In Germany, for instance, the company maintains its own Rail Service Centers (RSC) alongside a tight network of partner workshops, so that the maximum distance

to a locomotive workshop is less than 150 km. That makes it easy for national operating railway companies to get their locomotives repaired, if necessary, and promises easy access to workshops for light maintenance.

In addition to the sites in Germany, Siemens Mobility customers can rely on a system of locomotive workshops across Europe consisting of RSCs, network facilities, and partner workshops. They are situated at strategically important locations, like ports, freight terminals, and end points or junctions in the international TEN-T railway corridors. That puts the workshops close to where locomotives are in use every day. These sites ensure easy and immediate access to a workshop for locomotives, no matter where the entity in charge of maintenance (ECM) is located and where the locomotive is operated.

This comprehensive network is made even stronger with digitalization, starting with Rail service hub, a solution that brings workshops and locomotives together, for example to schedule maintenance appointments. ►



Siemens Mobility's network of locomotive workshops along the European railway corridors ensures a long service life and continuous availability.

SIEMENS MOBILITY'S EUROPEAN DEPOT AND SERVICE NETWORK FOR LOCOMOTIVE MAINTENANCE

The crown jewels in the Siemens Mobility Rail Services network for locomotive maintenance are the Rail Service Centers (RSC) in Munich-Allach, Germany; Hallsberg and Malmo, Sweden; and Novara, Italy. Further highlights are workshops operated in the framework of joint ventures in Rotterdam, the Netherlands – Locomotive Workshop Rotterdam (LWR) – and Bratislava, Slovakia – Rolling Stock Services Bratislava (RSSB). Technicians at the sites in Munich-Allach and Bratislava are capable of not only providing preventive and corrective maintenance, but also recurrent revisions of the locomotive car body and bogie, as well as renewing the wheelset, including adjustments of all modern train safety systems. Additionally, Siemens Mobility can provide revisions of the car body at the RSCs in Novara, Hallsberg, and Malmo. Soon, the service network will be made even stronger with additional depots at strategically important locations all over Europe.

S.C.



Digital from start to finish

Rail service hub basically digitalizes the ECM III process. The solution is based on Railigent X, the open suite of applications and data services from Siemens Mobility that leverages IoT and AI for rail assets. As such, it takes advantage of Application Programming Interfaces (APIs) to intelligently connect and analyze all available data from locomotives and workshops. This enables Rail service hub to provide fleet managers with information on real-time data, such as current operational status, GPS position, and open work orders for each vehicle. It then balances

these data against available maintenance capacities in connected workshops, which benefit from the ability to better manage their capacities. The outcome is an optimized recommendation for maintenance scheduling, allowing locomotives to be directed to a suitable workshop, reducing empty runs and downtime.

Railigent X also plays a role in processing data from the locomotives – namely the upwards of ►

Rail service hub helps fleet managers and workshop operators keep an eye on all maintenance planning and execution processes thanks to end-to-end digitalization.





The Rail Service Center in Novara, Italy, specializes in preventive and corrective maintenance of all locomotive components, including signaling systems.

four billion data points delivered annually by built-in sensors. The data is consulted for scheduled maintenance, that is, when certain due dates have been reached. And while locomotive maintenance generally takes place in the real world and entails planned downtime in a workshop, some smaller issues can be resolved on the fly based on digitalization.

Should spare parts be required in the framework of maintenance, planners can place orders via

MoBase®, the Siemens Mobility e-commerce platform. Altogether, solutions in Railigent X and MoBase optimize service schedules and thus help owners and operators better manage assets. But what does this all look like in practice? The following use cases provide an overview of the types of maintenance activities carried out using these digital tools in collaboration with the Siemens Mobility Rail Services network: ►

MORE FREIGHT TO BE TRANSPORTED BY RAIL

Road freight transport still dominates in the European Union. However, more and more goods are being transferred to the rails, with Germany recording the highest rail freight transport performance in the EU in 2022. In line with the European Green Deal, transport emissions need to be decreased by 90 percent by 2050. To achieve that goal, more freight will have to be moved within Europe on rail. According to prognoses, with 2015 as a base year, rail freight will double by 2050. S.C.

Sources:

eurostat: Railway freight transport statistics
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Railway_freight_transport_statistics
European Commission: Green Deal: Greening freight for more economic gain with less environmental impact
https://ec.europa.eu/commission/presscorner/detail/en/IP_23_3767

European Union Agency for Railways: FOSTERING THE RAILWAY SECTOR THROUGH THE EUROPEAN GREEN DEAL, REPORT, Part 2 – Freight https://www.era.europa.eu/system/files/2022-11/fostering_the_railway_sector_through_the_european_green_deal_-_freight_p.pdf



The Rail Service Center in Hallsberg, Sweden, went into operation in October 2022, making it one of the latest additions to Siemens Mobility's depot and service network. The center's experts provide locomotive maintenance, with a focus on overhauls and accident repairs.

Use case: Planned maintenance according to time or mileage intervals

When a certain due date has been reached, and a locomotive is covered by a Siemens Mobility Railcover® contract, the operator is contacted to arrange an inspection at a workshop. In this use case, the Vectron locomotive is operating between Rotterdam, the Netherlands, and Novara, Italy, and is due for inspection after 37,500 km of service. The operator can choose between the Locomotive Workshop Rotterdam (LWR), which Siemens Mobility operates with a partner in the port of Rotterdam, or Siemens Mobility's RSC in Novara. After just one day, the locomotive is released back into service. A similar approach is taken for other routine maintenance needs, like work on time-related components, for example,

train safety systems.

Some maintenance interventions require special infrastructure. For the major revision after 1.2 million km or eight years, the locomotive is generally directed to the Siemens Mobility RSC in Munich-Allach or to Rolling Stock Services Bratislava (RSSB), a workshop Siemens Mobility operates with a partner in Bratislava. Both workshops are equipped to perform the necessary revisions on the car body and the bogies, including wheelset changes. Alternatively, Siemens Mobility's RSCs in Novara or Hallsberg, Sweden, can take care of the major revision. While the modular revisions on the car body are performed on location, the bogies are sent to Munich-Allach. In the end, no matter where maintenance is performed, the results are the same, thanks to a highly qualified – ►



The Rail Service Center in Munich-Allach is Europe's leading location for locomotive maintenance at Siemens Mobility. Right next door is the production site of the Vectron vehicle family.

and growing – team and standardized processes and tools in all RSCs and partner workshops.

Use case: Corrective maintenance

Diagnostics in Railigent X detect an impending issue, here a failure on one of the engines in a locomotive in operation in Germany. Luckily, in Germany the longest distance to the next depot or workshop is no more than 150 km. Aside from saving time to reach a service location, this concentration has the added advantage of lower expenditures for track usage. And because these service centers are located at strategic locations, like freight terminals and industrial areas where locomotives are heavy in operation, downtime for corrective maintenance can be kept to a minimum. Time savings are also achieved by dispatching spare parts from MoBase within 24 hours.

Use case: After an accident

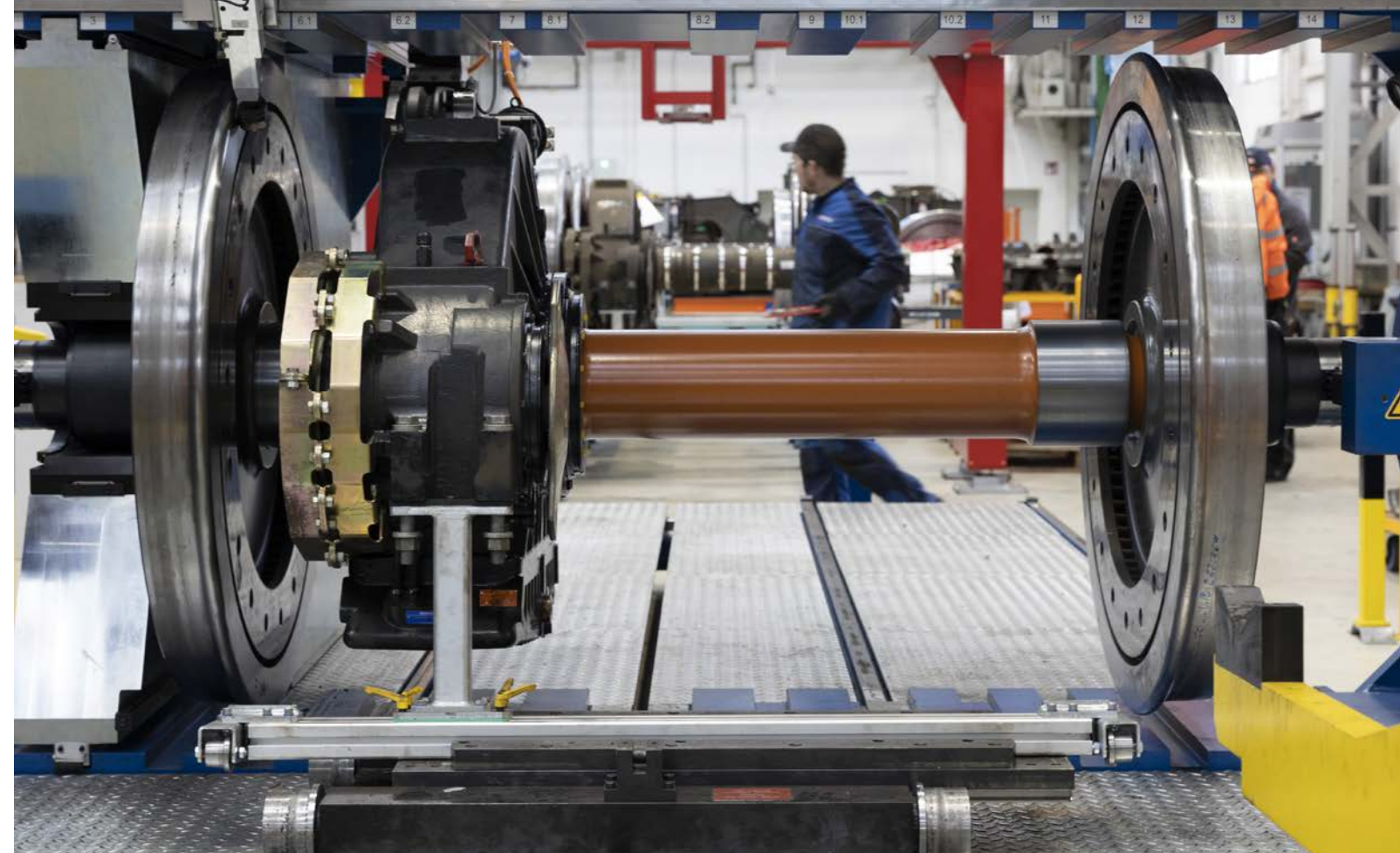
Should a Vectron locomotive be involved in a major accident, like a collision with a truck at a crossing or a derailment in a train yard, it can be sent to the

Siemens Mobility RSC in Munich-Allach. The specialists there can repair even the severest damage thanks to the close relationship with manufacturing colleagues, who are also at the site. Services after an accident include rebuilding the car body's mechanics and electronics, changing the front ends, and changing and repairing gearboxes and engines. For the latter, support comes from Siemens Mobility repair facilities in Nuremberg. When all work is done, the repaired locomotive is as good as new and the asset retains its value, despite the accident.

Damage from small and midsize accidents requiring wheelset changes and repairs to gearboxes, engines, and pantographs is taken care of locally, for example at the RSC in Novara, or the workshops in Hallsberg or Bratislava. The latter can also perform repairs on bogies and older locomotives, such as the BR189 and the Taurus.

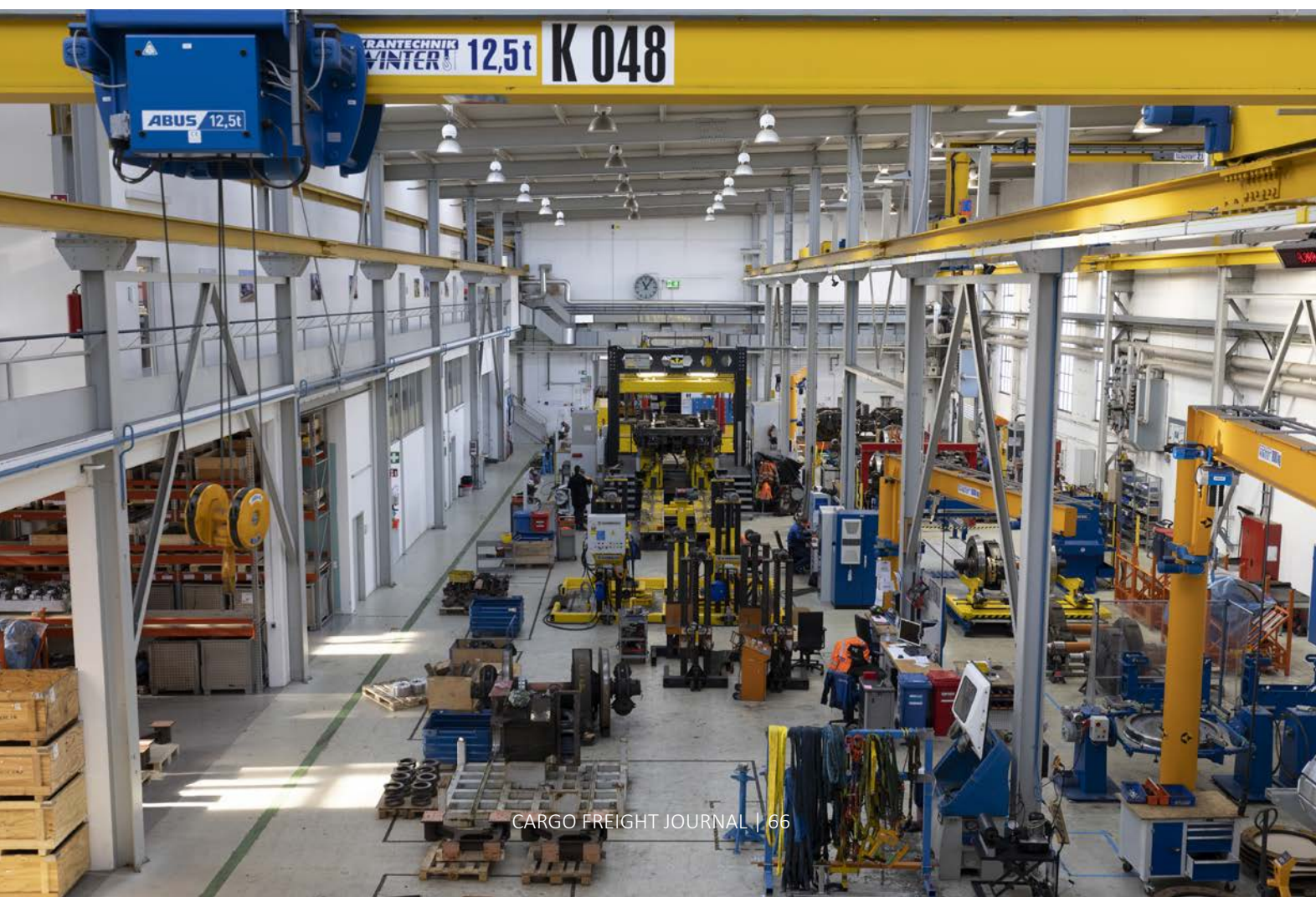
Meeting an expected surge in demand

The Vectron fleet is growing rapidly, not least of all due to the rise in freight transport via rail (see ►



As of 2026, customers of the Rail Service Center Munich-Allach will benefit from additional capacities and a wide offering of preventive and corrective maintenance services.

The in-house bogie service center in Munich-Allach enables complete revisions of bogies, including wheelset replacement.



box). With resources stretched to the limit, operators require the highest availability possible. And in the unlikely event of a failure, they need a speedy response. To be able to keep pace with maintenance requirements, Siemens Mobility is expanding its service locations in Europe by opening new service depots at strategically important locations. At the same time, the European lead RSC for locomotive maintenance in Munich-Allach is being equipped for the future. Along with expanding manufacturing capabilities, additional capacities are being made avail-

able for the wide range of preventive and corrective maintenance offers. Furthermore, the data center in Munich-Allach is also being enlarged in an effort to continually evolve and refine digital services based on Railigent X. This is just one more way in which Siemens Mobility is underscoring its commitment to combining the real and digital worlds to provide service efficiently and to keep locomotives moving.

Railcover: A modular service concept for Vectron locomotives from Siemens Mobility, which includes customer-specific maintenance services from full service to support contracts.



Further information:

Siemens Mobility workshop services:

<https://www.mobility.siemens.com/global/en/portfolio/rail-services/maintenance-services/workshop-services.html>

THE AUTOMATED BRAKE TEST (ABT) AS PART OF THE DIGITAL FREIGHT TRAIN (DFT)

This year, InnoTrans, the leading international trade fair for transport technology, will once again open its doors in Berlin. And once again, Siemens Mobility presents state-of-the-art technology solutions for rail vehicles, rail infrastructure, rail services, turnkey systems, software and rail components. Siemens Mobility will be represented with a large booth in Hub27 (booth No. 230) and with vehicles in the outdoor area.

With its digitalization efforts, Siemens Mobility enables mobility operators all over the world to make their assets intelligent, ensure sustainable value added over the entire life cycle and guarantee availability.

One digitalization product that will be exhibited is the “Automated Brake Test” (ABT) as part of the “Digital Freight Train” (DFT) portfolio, which will be the subject of this article.

The European Commission has set itself the goal of increasing rail freight transport by 50 percent by 2030 (compared to 2020) and even doubling it by 2050. In order to achieve these goals, new and modern technologies and methods must be incorporated into the existing ecosystem. For this, it is imperative to look at which process steps can be optimized and how. One sub-process that is currently very time-consuming is train preparation. Train preparation includes, among other things, the coupling of the cars, collecting information for wagon list and brake sheet (sometimes still on paper), the technical inspection of the cars and the brake test.

In addition, there are further requirements for rail freight transport that are brought to the railway by

other stakeholders or arise within the railway system. These include availability, reliability, safety and efficiency.

Digital Freight Train

In short, the “Digital Freight Train” covers all technology that aims to make rail freight more efficient, competitive and sustainable – it is Siemens’ solution for the above-mentioned process optimizations. All solutions belonging to the DFT can be clustered loosely into offerings such as “Cargo Monitoring”, “Condition-based Maintenance”, “Fleet Transparency”, “Digital Automatic Coupling” and the “Automated Brake Test”.

Cargo Monitoring helps the railway undertaking to optimize its logistics e.g. to avert claims for compensation due to the status of the load by supervising load conditions like temperature or humidity. It also supports the shipper with supply chain visibility.

Condition-based Maintenance enables smart maintenance cycles by monitoring the health status of assets, e.g. by detecting critical wear and recording mileage.

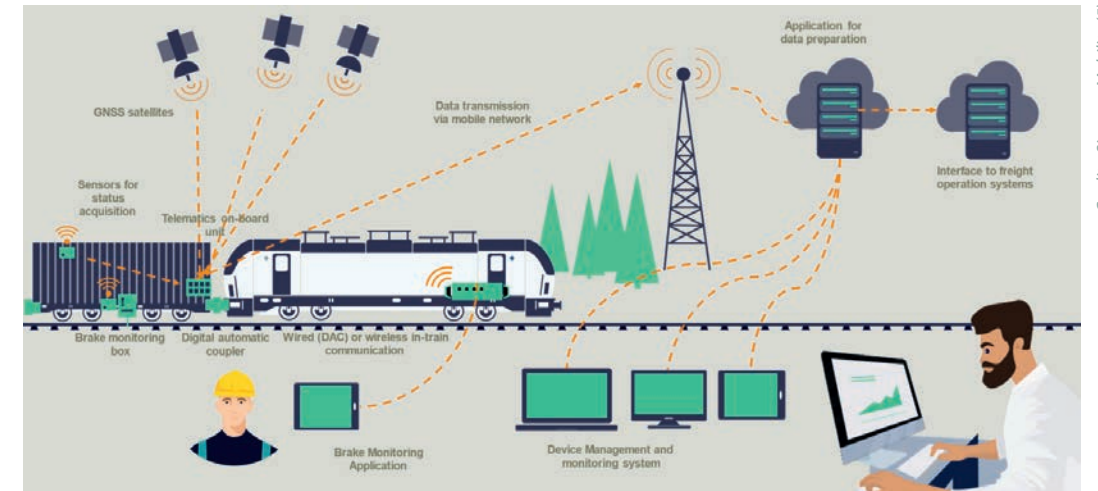
Fleet Transparency encompasses all solutions that deliver continuous operative asset data to improve operational services and fleet utilization.

Digital Automatic Coupling (DAC)

Of the DFT’s portfolio, the DAC is certainly the most prominent topic in Europe at the moment and is currently subject of European and national programs, congresses, discussions, news articles etc.

The DAC will significantly accelerate the ►

Figure 1: An overview of the Digital Freight Train with Automated Brake Testing, a Digital Automatic Coupling and Telematics



Credits: Siemens Mobility (5)

“coupling/uncoupling” subprocess within the scope of train preparation.

Coupling is not only needed, as immediately plausible, when assembling a new train – with train length up to 750 meters this can take hours – but also if the train consist changes during the train run. E.g. in a terminal, when a train is split into two parts for loading and is subsequently re-united. In this case, a brake test has to be performed. The same happens in a shunting yard if (only) one or a few wagons are detached or attached to the train.

Today coupling requires someone to unhook a screw coupling, extend it, place the end over the hook, tighten it and then connect air brake pipes between the vehicles. As mentioned, this is a very time-consuming process. In addition, there is a significant safety risk for those who have to couple wagons together or to a locomotive as even a small movement of a vehicle can have fatal consequences.

Soon, DAC should not only provide an easy way to mechanically couple the wagons, but also couple the brake pipe and provide all wagons in the train with electrical energy and a data-bus.

In the rail freight business, it is necessary, that all wagons are interoperable with each other, because there is – in principle – a free Interchange/exchange of the wagons between trains, between the different railway undertakings and between infrastructure managers. The Digital Automatic Coupling must be able to work seamlessly across Europe and be easily and cost-effectively retrofitted to locomotive and wagon fleets.

Automated Brake Test (ABT)

A second time consuming part of train preparation is the brake test. It is a requirement of all railways that braking systems on all vehicles – whether passenger or freight – must be tested and confirmed to be in operational condition before a train can be moved.

Although many passenger trains can automate this process and check braking status within a few minutes, it has always proved impossible to achieve this for freight because there is no capability to establish the conditions of braking systems on all wagons within a train.

Now this can be changed by “Controlguide CT-mobile BMS”, the automated brake test system of Siemens Mobility.

Instead of checking every single brake physically at least twice, the brake test responsible can do the work by standing beside the train or sitting in the driver’s cab of the loco in a fraction of the time. By eliminating the necessity of walking around the train a second time after visual inspection, we aim to provide a time saving of at least 50%!

A second motivation for creating this kind of a system is to reduce the costs that are caused by wheelset damages, especially by flat wheels caused by forgotten hand brakes. With the automated brake test system the person responsible sees the status of the hand brakes within the set of wagons on a tablet. He or she is hinted to the wagon where a hand brake is still tightened, can loosen the hand brake, and prevent a flat wheel.

A third – but just as important point – is, that it is more and more difficult to get (specialist) staff ►



Figure 2: Components of Controlguide CTmobile BMS

to do the brake test. Brake Test is a manual process requiring a highly trained and skilled workforce. The people work outside, the whole year, in hot summer like in cold winters, with rain, fog, icy ground or storm. With the ABT system the job will get much more pleasant.

How will the system work? There are several components that play together and build the system. On each wagon there are several sensors, connected wirelessly or by wire with the ABT evaluation unit that computes the measured values. On each side of the wagon there can be a display that shows the status of the sensors as well as a health status of the ABT

system on this wagon. In general, the same Information that is shown on the display is transmitted to the ABT central processing unit.

This central processing unit collects all information of all wagons in the train set and provides it for the brake test application, whose graphical user interface (GUI) is shown on a mobile terminal (see figure 3), e.g. any commercial off-the-shelf tablet. The GUI guides the staff through the brake test process. After logging on to the system and choosing the train he/she will work on, the brake test responsible is guided through the steps of the brake test.

Because of the big advantages of the ABT sys- ►

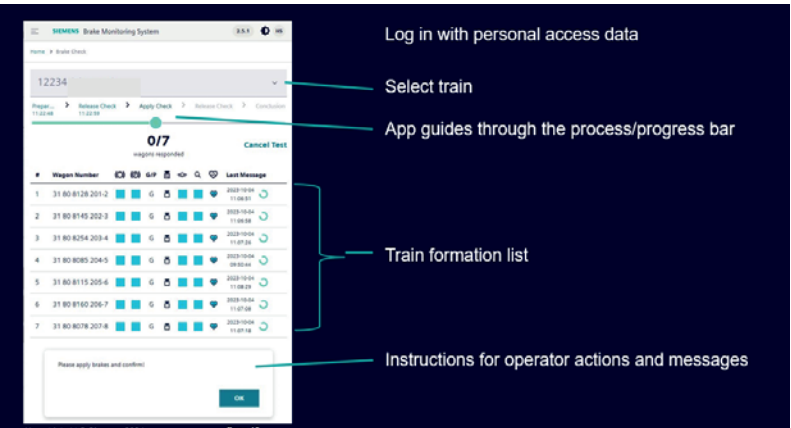


Figure 3 Example of the Graphical User Interface

tem, we want to leverage these advantages already before the DAC is rolled out – for the railway undertakings as well as for the wagon keeper.

With our strategy, we foresee a sensible order and sequence of innovations that support a stepwise digitalization process of rail freight. This is in line with a recently published memorandum of the DIE GÜTERBAHNEN. In general, this will support early adoption by adapting existing processes and providing sufficient training for the employees involved. This will allow certification and release of required modifications to the processes in time, e.g. within the Train Test Lab work package of FP5 Trans4rm-R. In this phase “before the DAC”, the system needs independent energy and communication facilities. Initially the ABT system will bring its own power source in the form of a battery. The communication between the wagons and the ABT central processing unit will take place via wireless radio communication.

With the development of our Automated Brake test system, we follow a “DAC-ready” strategy: With rollout of the DAC, the automated brake test will become an essential part of DAC-equipped trains. For this reason, Siemens’ ABT system is designed to integrate flawlessly into DAC. This means, once it becomes available, our system will be able to use the energy provided by the DAC power line and the physical communication line. By participating in the ma-

jor European Initiatives (i.e. TIS and ERJU), we are also aiming to provide an Interoperable solution from the very beginning. Our goal with the “DAC-ready” strategy is to provide value to our customers as early as possible, while safeguarding any future Investment into the Digital Automatic Coupler ecosystem. In this way, by stretching the required investment for the DAC system, we aim to alleviate the burden of investment in a full DAC system for the railway undertakings and support a timely rollout of DAC.

Conclusion

The Digital Freight Train (DFT) is our way to digitize rail freight traffic and to make it more efficient and future-proof.

The Automated Brake Test (ABT) is the first important part of the DFT with a short Return of Investment. It helps to reduce the time that is needed for train preparation and to reduce the costs not only for the brake test but also for wheelset damages. Furthermore, these solutions make work more attractive and modern for employees, which makes recruiting easier.

With ABT you – as a railway undertaking as well as a wagon keeper – can leverage the advantages of the system before the DAC will be rolled out and get a first glimpse of how modern, digital and efficient rail freight traffic may look like in the future!



For more information and further details about the Digital Freight Train and the Automated Brake Test please scan the QR-code (<https://www.mobility.siemens.com/global/en/portfolio/digital-solutions-software/infrastructure/telematic-systems.html?stc=demo201716>) and visit us at InnoTrans in Hub27, booth No. 230.

Dr. Martin LINK and Kai VERGIN



Dipl. Ing. Kai Vergin is Sales Manager at Siemens Mobility GmbH since 2013. Prior to that, he held various positions in the field of IT systems for railways.
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Dr. Martin Link started his career at Siemens Mobility in September 2021 as a Systems Engineer for Rail Automation within the Special Resources qualification program for university graduates. Since May 2022 he is the Product Manager for the Digital Freight Train.

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“Remove armies of lawyers from the system – more rail for the same money!”

The British railway privatisation model has failed. Now the new British Labour government is bringing the rail system back under state control at full steam. Immediately after the government program was announced, we spoke to Prof. Dr. Jon Shaw. He teaches and researches at the University of Plymouth. Since the 1990s, Shaw has become known through various publications on the privatisation of the British railway system, integrated ticket offers and other areas of transport and mobility.



Credits: Hermann Schmidtendorf

? **CARGO FREIGHT JOURNAL:** Professor Jon Shaw, I am delighted to be speaking to you again about rail issues in the UK. It is worth summarising the current situation, particularly as a few weeks ago there was a general election in the UK and there was a political change from the Tories to the Labour Party. There is an old saying that new brooms sweep well, but old brooms know the corners. In this respect, however, the new brooms should also know the corners. Is it already apparent that rail issues will be treated differently in the new government?

Prof. Jon Shaw: That's interesting because we have, as you say, a new broom, the new Labour Party, and they opened Parliament just today, just before we spoke, with the **King's Speech**, in which the Government sets out the legislation that it will be passing over the next year. There are actually three Railways Bills that they are going to pass. The first is called the **Passenger Railway Services Bill**. This will put the privatised rail operators and companies into public ownership. Companies like **Great Western, Southern and Thameslink** will be put into public ownership, or in some cases will remain in public ownership. That will be done by waiting until their current franchise contracts end and then not renewing them. So it will cost nothing. The State will not be buying companies.

Then there is a separate Bill that will be passed by Parliament called the **Railways Bill**. This will create a new organisation called **GBR, Great British Railways**. This organisation will oversee the running of the railways. It will be responsible for all the tracks, as **Network Rail** is now, but also for running passenger services. So it will introduce the timetables and the service levels and things like that. After years of everything being separate, the idea is that this will now be brought back together.

? Will Network Rail be integrated too?

Yes. So it will be similar to what **British Rail** used to be before privatisation, but not quite the same. The idea is that there is one organisation responsible for running the railways, investing in the railways, planning the railways and running the railways. So that is the big change that Labour will bring about. They can do away with a lot of the contracts that currently exist in the industry. Currently, if one company has a delayed train and that causes other companies' trains to be delayed, teams of lawyers will have to sort out who has to pay compensation to whom and things like that.

? So, this King's Speech was a Black Friday for legions of lawyers? ►

Yes. That's right. The idea is that we remove the armies of lawyers from the system. The real benefit will be integration and hopefully reducing costs as a result. We now have a railway system that costs more to run than it should. The idea is to be able to use some of the money currently spent on the railways more sensibly and efficiently and in that way spend more money on the actual rail service.

? To spend money more logically?

Exactly. When Covid hit, the government basically cancelled all the concessions and just ran the railways on a management contract and gave subsidies to the rail operators so they could keep going. But since the lockdown ended, they have maintained a ridiculous funding arrangement which is really problematic. The **Department of Transport** pays subsidies to the rail operators and they pay money that comes in through fares, for example, to the Treasury. There is no single profit and loss account like in a normal company.

A really good example: after the lockdowns, the busiest days are Friday and Saturday. We know that if we were to run a Friday or Saturday service on a Sunday, we would also be very busy. If you run more trains on a Sunday, of course it costs you more. But guess what – you sell more tickets and make more revenue. But at the moment we can't do that because the train companies say to the Department for Transport, "OK, we want to run 100 extra trains on a Sunday." And the Department for Transport says: We can't because it will cost us an extra £10 million. And the train companies say: Yes, but we make £20 million from ticket revenue. And they say yes, but I don't care because we don't see any of the money going directly to the state treasury.

? In recent years, we have faced the situation several times when a concessionaire could not perform its duties due to financial losses. And then a state-owned railway company has already taken over the task. If they talked about market arrangements, but offered a bad bank or a bad rail that could take over the losses, where is the market? Operator of Last Resort. This company name for the state-owned parachute company reminds me of the

operator of last hope, of the last prayer... A rather special humor? What will happen to this parachute company owned by the state? Will it also be converted into a corporation?

It will also be integrated into Great British Railways. Currently there are four companies run by the state. The parachute company is called OLR, **Operator of Last Resort**. In the future, Great British Railways will basically become the Operator of First Resort. And it will be legal for the state to run these railway companies permanently. Whereas currently, under current legislation, they are only supposed to be run by the Ministry of Transport as a last resort until they can be reprivated.

? Which precluded a positive development?

Well, interestingly, companies like **LNER**, with their London to Edinburgh services, are generally regarded as very well-run national companies. Some of the managers who work for LNER have said that it was easier to get things done as a nationalised company than as a private company.

? Interesting! What will the concessionaires do now? They were legal private companies working from one concession to the next. They have their staff as well. Will they send all their people to the newly formed company?

Yes. There is a special legal provision that allows that if one company takes over another or all the companies, the rail staff will just move to the new company. So the same thing will happen if GBR takes over. You have just asked a very interesting question about the existing concessionaires, because at the moment there are a number of groups of companies that already own concessions in the private sector – **Italia, First Group, which was Arriva**. Under the government's plans, when the concessions expire, they will simply go into public ownership, so no private ownership group will lose money because they would use their contract until it is expected to end or until there is a termination date and then it would go into public ownership. There is a really interesting development here: Arriva, which was owned by Deutsche Bahn, has just been bought by a ►

THE SITUATION TODAY: PRIVATE TRAINS WITH MEAGUE PROFITS, THE STATE BEARS THE LOSS

When the British state railway British Rail BR was privatised, the network was divided into numerous franchise sectors. Rail operations on some of them were awarded to the highest bidder in tenders. The contract term was usually only five to seven years. Due to the corona pandemic, the franchise model was suspended on March 23, 2020. The financial risk and responsibility for rail operations were transferred to the Ministry of Transport, known as the Department of Transport (DfT). This solution was declared permanent with the Emergency Recovery Measures Agreements ERMA of September 21, 2020. The DfT continues to cover the railway companies' losses and pays them a fixed fee of up to 1.5% of pre-pandemic operating costs.

FOUR RUS ARE ALREADY QUASI-NATIONALISED

In order to secure a franchise concession, RUs often made exaggeratedly high estimates of ticket revenue. The state subsidies calculated from this were later too low, partly because the companies had to pay fines and train delays due to poor infrastructure. For these cases, the Ministry of Transport set up a "stopgap company", DfT OLR Holdings Limited. The DOHL Group currently operates more than 3,600 trains a day and employs over 14,800 people.

It is currently responsible for the rolling stock leasing company Train Fleet (2019) Limited and four bankrupt RUs:

East Coast Main Line, through a wholly owned subsidiary, **London North Eastern Railway (LNER)**, on 24 June 2018 **Northern Rail**, through a wholly owned subsidiary, **Northern Trains Limited (NTL)**, on 1 March 2020 **London & South Eastern Railway (LSER)** services, through a wholly owned subsidiary, **Southeastern Trains Limited (SET)**, from 17 October 2021 **TransPennine Express (TPE)**, through a wholly owned subsidiary, **TransPennine Trains (TPT)**, on 28 May 2023.

The aim of the upcoming reform is to integrate all current franchise RUs into the new state-owned railway company to be founded, Great British Rail GBR. But this formation can take up to 18 months. Therefore, franchised railway companies whose concessions expire will initially be transferred to the state-owned DOHL Group following the tried and tested model. However, this only affects the franchise part of the activities. Anyone who also operates bus services will be able to continue to do so privately.



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separate private company, and this bought Arriva knowing full well that this new legislation was going to come into force. So they bought this rail operator and are likely to lose it.

There are two aspects of privatised rail that will remain, though. On the passenger side, we have these small companies called **Open Access Operators**. So there is **Hull Trains, Grand Central, Heathrow Express**, and these will be able to continue to be privately owned because they are not

using concessions. There is a debate about whether they are paying enough to get access to the line. But they have done a good job at their own risk. **Lumo** is another open access operator that runs between London and Edinburgh and they have also been very successful, partly because they have brought new business to rail, because they have taken traffic away from air, which is good. And the other big area that will remain privately owned is freight. **Freight services** will continue to be privately operated. ►

? You said there will be a third bill. What would it cover?

The third bill follows the HS2 high-speed rail project, some parts of which were scrapped. This new third bill brings powers to build high-speed and improved infrastructure in the north of England, essentially on the line between Liverpool and York. The previous government promised it but didn't do it. The Labour party has now done it.

? In the last few months it has become clear that the full HS2 high-speed line will not be built using the Y scheme. I understand there have been rumours because it could of course happen that freight traffic will come back onto the already congested roads. And there are not enough drivers for the lorries because unfortunately all the foreigners from the EU have had to leave the country. Is

there any chance that the rail system will take more freight or at least the same amount as now?

We obviously want to get the rail to carry as much freight as possible. So we are hoping – but I am not aware of any announcement yet – that some of the abandoned HS2 scheme will be revived. Maybe it will be revived in a different way, maybe a little slower. At the moment what they are planning to build is useless and it will cost a lot of money to build a useless railway. They need to do something to take the line to central London and take it at least a little further up the West Coast Main Line to free up the capacity because that is where we will get the real freight gains and also the gains in regional rail.

The interview was conducted by Hermann Schmidten-dorf on 17 July 2024.



Great Western Railway train on the south English North Sea coast 2015.

Credits: Phil_Wakeley CC BY-SA 2.0

In the beginning there was steam

BRITISH RAILWAYS: INNOVATIVE, TRADITIONAL – AND WITH A BACKLOG OF MODERNISATION

At the beginning of the 19th century, the coal mines and metal works in England promoted industrial and technological progress – including steam technology. In 1802, the Briton **Richard Trevithick** built a stationary high-pressure steam engine. Two years later, he put the engine on wheels and pulled a train of five carriages with ten tons of iron and 70 people over 15.7 kilometres. The cast-iron rails laid there at the time largely broke under the high axle pressure, and the steam engine was used stationary again.

One year later, in 1805, a steam locomotive built by **John Whinfield** in Gateshead according to Trevithick's plans carried out test runs on the premises of an iron foundry. Here too, the locomotive was too heavy for the wooden rails still in use there, and it was no longer used.

The most persistent and leading to the breakthrough was the work of **George Stephenson**. From 1812 he was the enginewright at the Killingworth coal mine in County Durham. This had a mine railway on whose tracks with a gauge of 423 feet (4 feet 8 inches) = 1420 mm coal wagons were pulled by horses. In 1814 Stephenson built his first locomotive for transporting coal on the Killingworth wagon railway. It is considered to be the first successful locomotive with flanged wheels. In total, Stephenson is said to have built 16 locomotives in Killingworth. This allowed him to continually improve his designs. For example, track breaks could be reduced by evenly distributing the weight of the locomotive by using multiple wheels or bogies.

In 1821, the construction of the Stockton and Darlington Railway (S&DR) was permitted by an Act of Parliament. A 40-kilometre-long railway was to connect several coal mines with the River Tees in Stockton. Stephenson convinced investor Edward Pease that the coal wagons should be pulled by steam locomotives rather than horses. Construction work began in the same year. Stephenson used wrought iron, malleable rails that could be manufactured in greater lengths and with greater stability than cast iron rails.

George & Robert Stephenson and the 1435 mm

In 1823, Stephenson founded the company **Robert Stephenson & Co. with Pease in Newcastle to build the locomotives. It was the first locomotive factory in the world.** Why Robert? Stephenson appointed his son Robert, who was only 20 years old at the time, as managing director. Stephenson's parents were illiterate, and George Stephenson spoke English with an accent that was considered inferior at the time. Stephenson therefore gave his son a high-quality education that prepared him not only for work as an engineer, but also for life in trade and business. Important: Robert took special courses to speak with a "Received Pronunciation" accent. This linguistic "high English" standard is mainly due to the universities of London, Oxford and Cambridge, as well as the elite schools such as Eton, Harrow and Rugby. It ensured that Robert was accepted in high society circles, which was never the case with his father. ►

In September 1825, the Forth Street factory in Newcastle completed the first locomotive for the railway: it was originally called Active and then renamed Locomotion. It was followed by Hope, Diligence and Black Diamond. The first railway carriage, Experiment, was also built.

For the Stockton and Darlington Railway, which began operations in 1825, Stephenson used the 4 ft 8 in = 1420 mm gauge previously used in the coal mines, in order to be able to use the hundreds of horse-drawn wagons that were already in use on the freight wagon routes in the mines. After 15 years, the railway was converted to **the 1435 mm (4 ft, 8½ in) gauge**, which Stephenson had been using since the opening of the **Liverpool-Manchester railway in 1830**. By adding an additional ½ inch, Stephenson gave the wagons additional freedom of movement and smooth running, reducing the risk of getting stuck in curves.

Broad gauge loses the "gauge war"

The **Great Western Railway GWR** was founded in 1835 out of the **competition between the port city**

of Bristol and Liverpool. It was intended to maintain Bristol's position as the second largest port in the country and the most important for American trade and, like the railway line from Liverpool, to lead to London – but with unprecedented quality standards to outperform other lines. The **engineer Isambard Kingdom Brunel** therefore chose a broad gauge of 7 feet 1¼ inches (2,140 mm) for the line. But in 1844 the broad gauge line of the Bristol and Gloucester Railway met the already existing standard gauge lines of the Birmingham and Gloucester Railway. Passengers had to change trains at Gloucester station between the southwest and the north and goods had to be reloaded.

In a **"gauge war"**, the GWR wanted to aggressively enforce its railway profile. But it lost to Stephenson because the existing lines with "his" gauge were already eight times longer than the competing GWR broad gauge. A Royal Commission was formed. In **1846, the Railway Regulation (Gauge) Act banned the 7-foot gauge by law**, except in the south-west of England and Wales, where railways were connected to the GWR network. New passenger railways ►

The "Robt. Stephenson and Comp." was also the builder of the first steam locomotive on German soil, the "Adler" – here is a detail of the roadworthy DB replica.



Credits: Hermann Schmidtendorf

were to be built in Great Britain with a standard gauge of 4 feet 8 ½ inches (**1,435 mm**) and in Ireland with a new standard gauge of 5 feet 3 inches (**1,600 mm**). After an interim period of mixed gauge operations (the tracks were laid with three rails), the GWR completed the conversion of its network to standard gauge in 1892. Subsequently, many countries adopted this gauge as their national standard gauge, which gave rise to **the term standard gauge**. In Germany too – **the first functioning steam locomotive on a railway on German soil, the ADLER (Eagle), came from the Stephenson factory** and was driven by an employee of this company on the inaugural run of the Nuremberg-Fürth line on 7 December 1835.

Clearance profile: standardised on the continent...

Unlike the track profile, the railways of continental Europe went their own way when it came to loading gauge and clearance profile. On **May 16, 1886**, Switzerland, Austria-Hungary, the German Empire, France and Italy agreed to the **State Treaty on Technical Unity in Railways (TE)** – or **Technical Unit** for short – in **Bern**. The international, French name was: **Conférence internationale pour l'unité technique des chemins de fer (UT)**. More and more European railways subsequently joined the agreement. In **1922**, the international railway association **Union Internationale des Chemins de Fer (UIC)** was created as a working body. The agreements on the cross-sectional design of the railway facilities, track spacing, tunnels and underpasses of bridges and the outlines of railway wagons allowed freight wagons to be used in free traffic on the various networks that were merging. A common

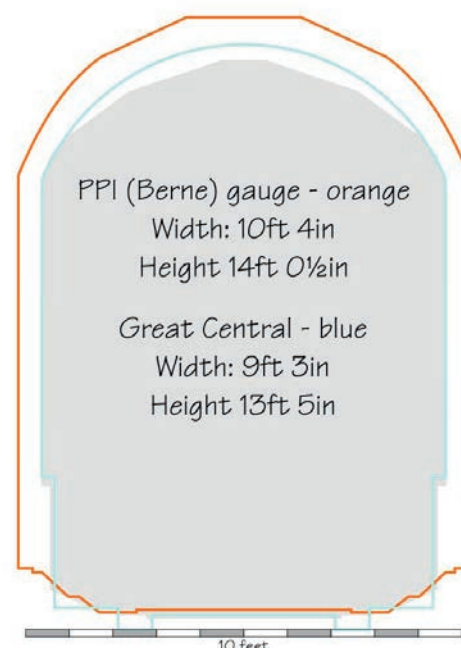
minimum standard was agreed at a follow-up conference in **Bern** in **1912**. This meant that freight wagons built to this gauge could be used internationally.

The associated gauge was called **Gabarit passe-partout international**, abbreviated to **Gab-arit PPI** – a standard size for trains. It was set at a half width of 1575 mm (total width 3150 mm), which tapers above 3175 mm, and is a maximum of 4280 mm high in the middle of the wagon. These vehicles must comply with the associated clearance gauge even with a minimum curve radius of 250 m. Long wagons therefore have to be narrower.

... as narrow as possible in Great Britain

Such early regulations were lacking in the United Kingdom. The railways were built by a large number of different private companies, each of which had different standards for the width and height of the trains. **In 1922, after numerous mergers, the railways consolidated into four companies. It was not until 1948 that these so-called “Big Four” – Great Western Railway GWR, London and North Eastern Railway LNER, London, Midland and Scottish Railway LMS and Southern Railway SR – were nationalised to form the state railway British Railways BR.** The newly formed British Railways were initially divided into six regions in 1948. **In 1965 the company was renamed British Rail.**

The British gauge reflects the fundamental motivation of private railway builders to transport coal and ore in large quantities from place to place. Passenger traffic was secondary. **The gauge was therefore defined with a view to relatively small wagons.** Stephenson ►



The continental European “Berne” clearance profile PPI in orange, the profile of one of the most spacious English railways Great Central in blue: British tunnels and railway vehicles are narrower and lower, offering less space for passengers and their baggage.

Credits: Jim Champ,
<https://www.devboats.co.uk/gwdrawings/loadinggauges.php>



In 1948, the state-owned British Railways were founded.

had endeavored to create a generous route through flat terrain with wide curves, if necessary with the help of cuttings, embankments and stone viaducts. But Stephenson's construction plans were too expensive for some investors, and he lost several projects to competitors. It was not until the founding of British Railways that a national standard was defined. Due to the power of facts, **the British standard generally remained smaller than the “Bern gauge” on the European continent.** Smaller clearance gauges on older lines remained. **Even on individual lines, the static restrictions were rarely universal.** It was common for there to be certain lines with restricted clearance gauges, as well as lines with weight restrictions. These were usually listed in general or section-by-section appendices to the regulations of the respective private company. Different conditions on **platforms** posed an additional challenge.

The result was a lack of crossing options for vehicles and massive disruption to traffic. **The Southern Railway's “Hastings Line”** gained negative notoriety: it had been built with tunnels that were too small for the already small gauge of the South Eastern Railway. As a result, particularly small locomotives and wagons were required. This problem was not solved until 1986, when all tunnels were reduced to single-track traffic as part of the electrification of the line.

Expensive trains, missed opportunities

As a result, new wagons, multiple units and locomotives have to be developed specifically for the existing British network. Rolling stock used on the continent is too wide and too high for the British Isles. The financial implications of this were explained in the government report “HS2 Cost and Risk Model Report. A report to Government by HS2 Ltd” from March 2012. The report stated that **for the new trains on the planned HS2 high-speed line a 50 percent**



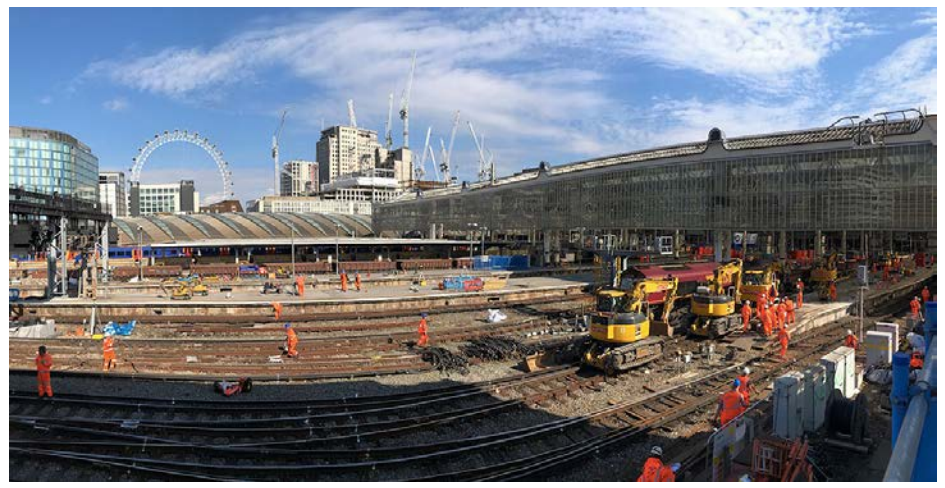
In 1964, the double arrow logo was introduced with the new name British Rail.

surcharge on the “classically compatible” trains would be charged, which are “compatible” with both the current (i.e. “classically”) clearance gauge of the rail network and the HS2 line. The “classically compatible” trains cost 40 million pounds per train, while the pure HS2 train, which is built to European clearance gauge and is only suitable for operation on HS2 lines, should cost 27 million pounds per train. And this despite the fact that the pure HS2 train is physically larger.

In 1928 the Board of Trade specified a fairly generous gauge for new trains, which was significantly larger than most existing gauges – 15 feet on centres. Overhead electrification was apparently being considered. However, this specification had no far-reaching consequences. **Even after nationalisation, the railway network was neglected to fundamentally modernise.** In 1951, only a standard static gauge of W5 was specified, which was intended to fit almost everywhere on the network. With the W6a gauge, the lower car body was changed to allow electrification by a side conductor rail. Profiles W10 to W12 define a flat line on the top, and instead of a strict static gauge for the wagons, their sizes are derived from dynamic gauge calculations for rectangular freight containers. In 2004, a strategy to improve loading gauges was again adopted. But it was still clear that modern freight trains, especially those with standard containers, would not be able to run everywhere. **In 2007, a strategy was published to identify and use freight routes with W10 and W12 standards on which such trains should run without problems.**

A **“piggyback consortium”** tried to convince **Railtrack**, the company responsible for rail infrastructure since the privatization of British Rail in 1994, to undertake a more comprehensive modernization of the structure gauge. The aim was to also enable the transport of deep-sea containers and swap bodies by rail. But Railtrack made it clear in 1998 that it had ►

London is bursting at the seams – there is an increasing demand for rail traffic. In 2017, the modernisation of Waterloo Station was a significant challenge.



Credits: Network Rail

no interest in a comprehensive modernisation. Even a limited project for the transport of 2.78 m high containers would “satisfy the market,” the consortium reported in a memorandum dated November 30, 1998. Rail freight traffic was apparently considered less sensitive than passenger traffic. **Rail freight companies had long complained**, among other things, about **a lack of freight capacity in the north-west of London**. The limitations on network capacity resulting from the various railway line cuts since the 1960s mean that freight companies have had consistent difficulties finding routes for their trains.

Electrified lines: 24.32% with 25 kV 50 Hz AC, 13.68% with 750 V DC

The fragmentation of railway lines from the early days to the present day has also had a negative impact on the electrification of British railways. Initially, traction power systems with 600 V, 625 V and 1,500 V DC were introduced, among others. In 1956, British Railways chose traction power supply via overhead lines with 25 kV, 50 Hz AC as the national standard for future electrification projects. Several existing railways have been converted accordingly. **In October 2023, only 6,065 kilometres were electrified, which is 3,769 miles or 38 percent of the British rail network.** According to Network Rail, **by 2023, 64 percent of the electrified network will use the 25 kV AC overhead line system and 36 percent will use the 660/750 V DC system with a conductor rail** next to the track. Network Rail took over the entire rail infrastructure from Railtrack on October 3, 2002.

This coexistence of systems, which still exists to-

day, also makes British railways expensive. Locomotives that are to run everywhere must be equipped for two power systems and also with a diesel engine, a battery or a fuel cell!

The electrification strategy is extremely inconsistent, a constant up and down. In 2007, the British government advocated the continuation of diesel traction through the use of biodiesel. Then in 2009, plans were announced to electrify the Great Western Main Line from London to Swansea and in the north-west of England. Shorter sections of the route without traction power were also to be equipped, with the “fill ins”. In 2012, the plans were expanded. But on 25 June 2015, the government announced that some of the electrification projects would be postponed or cut back due to rising costs. Some work would also be “paused”. Then it was said that work would continue with a postponed completion date. Then again, in 2017, the Transport Minister praised hybrid technology as an alternative. On 23 March 2021, a parliamentary report called for the immediate resumption of electrification with a rolling programme.

The future of the conductor rail for electrically supplying traction vehicles also remains to be resolved. As early as June 2011, Peter Dearman of Network Rail had proposed that **the conductor rail network should be converted to overhead lines**. The conductor rail network had reached the limit of its capacity, especially as trains were becoming more and more technologically advanced. The Office of Rail and Road (ORR) also stated that 750 V DC conductor rails have a limited future for safety reasons. On the other hand, the **electrification of the railways with 25 kV AC in Scotland is progressing positively.** ►

There, the local government is responsible for transport and is implementing a plan to electrify many important routes in central Scotland.
Hermann Schmidtendorf

BRITISCHE EISENBAHNEN – FACTS & FIGURES

State railway: British Railways 1948-1965. British Rail 1965-1994. Then manager of the railway infrastructure: Railtrack (private) until 2002. Network Rail (public, non-profit) until today.

Independent public regulator: Office of Rail and Road ORR, since 2004

Private and publicly run heritage and tourist railways: 600 miles (960 km) 2023, 460 railway stations

Railway network: 1948 19,630 miles (31,5910 km). 1960 18,369 miles (29,562 km). 1975 approx. 11,000 miles (17,000 km). 2022 9,864 miles (15,874 km), 2,570 stations

Key development steps: Driving on the left. Electrification with 25 kV 50 Hz AC. Modernised signaling systems. 1975 Introduction of a computer system for monitoring around 200,000 freight wagons. Introduction of an InterCity passenger service at 125 mph / 200 km/h between Britain’s major cities.

Freight transport: 1968 Founding of the Freightliner company within British Rail. 1996 Privatisation. After DB Cargo UK (formerly English, Welsh & Scottish Railway, EWS), today the second largest provider of rail freight transport in Great Britain.

Political mistakes: After World War II, the government only authorized British Railways to use limited amounts of raw materials. But road traffic was allowed to exceed the limits granted to it year after year. It was not until nine years after the end of the war that BR was able to clear the backlog of track renewals that had been left over from the war. In addition, by government order, a court decided on the level of railway tolls and ticket prices and delayed increases for over 12 years. There was a government subsidy, but in the form of an interest-bearing loan, while BR’s suppliers were able to raise their prices unhindered. (Tim. Pickford-Jones and Timmonet)

Wage increase: Between 1948 and 1960, the rail unions fought for an average increase of over 200 percent. The government did not cover the state railway’s ever-increasing losses.

Potential conflict of interest: Minister of Transport (1959-1964) Ernest Marples was co-founder, director (until 1951) and shareholder (until 1960) of the road construction company Marples Ridgway, which received many government contracts. At the opening of the M1 motorway, Marples showed his preference for the road, saying: “This project is in keeping with the emerging scientific age in which we live.”

The Beeching Axe: Under Marples, Dr Richard Beeching was appointed to provide the government with the basis for a major reduction in the railways. In two reports in 1963 and 1965, he identified 2,363 stations and about 5,000 miles (8,000 line kilometres) across the country as redundant – a total of 55 percent of the stations and 30 percent of the railway lines. The “axe” did not eliminate all the proposed railway lines because there was considerable protest from communities and unions, but it significantly worsened rail access for rural people and industry. The hoped-for savings in the state and railway budgets were not achieved.

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Dr. Richard Beeching

Foto: <https://www.npg.org.uk/collections/search/portrait/mw109425>

PJM: Digital Solutions for automatic brake tests, against derailments

Günter Petschnig, a graduate mechanical engineer (TU Graz), has been managing partner/CEO of PJ Messtechnik GmbH/PJ Monitoring GmbH since 2006. In an interview with CARGO FREIGHT JOURNAL, he explains the latest digital development solutions for rail freight transport.



CARGO FREIGHT JOURNAL: Mr. Petschnig, your company PJM was recently awarded a prestigious prize by the Austrian federal government. What kind of prize is that?

Günter Petschnig: We won the State Prize for Digitalisation for our automatic brake test. We are of course very proud to have been awarded this prestigious prize. It is also an important signal that politicians are interested in the subject of freight transport. Rail transport has the potential to better address the climate issue and to better solve today's problems. Our product and freight transport are a great fit.

? Is that perhaps also a reason for companies that are to be addressed here – companies in the freight rail sector – to say, now we're getting on board with it, if it is now obviously being given higher honours?

Sure. Rolling out a system that can be used across Europe is of course a long process. You have to convince many organizations and parties. We have been on the market with this topic for years. There is now a lot of interest. We have strong support from wagon owners, now also from OEMs and from many railway companies. We see that the topic of automation is also becoming increasingly important for the leading state railways, as the automatic brake test as a function generates positive business cases for railway companies.

As a company, we see ourselves very well equipped to be able to meet the large demand in the sector.

? There are video promotional films from Switzerland from the Swiss Federal Railways SBB, in which people obviously walk around the freight wagons with your system, or rather no longer have to walk around extensively. So there already seems to be a lot of interest in Switzerland?

It must be said that this is not just our system. It is also a system that we developed together with the Swiss Federal Railways. Without their help, this would have been impossible. They have been using our system in the field for years. They are the ones who test the system and design it so that it works in the field and all the operational processes that depend on automation are correctly addressed and processed. It is important that the staff on the track can also associate themselves with the system and enjoy working with it. Without SBB Cargo, the overall system development would not have been possible.

? What is still missing so that the system can be used on a larger scale? Technically, it seems to be fully developed.

In Switzerland, there is an effort to expand the system to a large number of transport routes. In Europe, it is increasingly recognised that it is a system that can work here in the long term and that brings advan-

tages. Many small and medium-sized wagon owners recognize that automation saves a lot of time, increases availability and minimizes risk.

Nevertheless, the rollout of such a system is a process that takes several years. The railway company must adapt its operational processes and internal structures and ensure that its employees are trained so that all the positive effects of automation can be exploited.

? And is it perhaps the case that many hope that large public financial grants will then bring about the Digital Automatic Coupling (DAC), which promises that it will then carry out such functions?

In the future, in ten, 15, 20 years, many things are certainly possible. Nevertheless, it is important that we take small steps to move the sector forward today. Every positive development strengthens freight transport and has the potential to bring more volume onto the rails. The automatic brake test is a mature solution and can be rolled out today. The sector should fall back on what is already working and available today and not just hope for solutions in the distant future. Otherwise, the climate targets set for freight transport will by no means be achieved.

The advantage is that our system can already imple-

ment a large part of the functionalities associated with the DAC. And when the DAC is available, it will make the roll-out process easier, as our modular system will be compatible with any future DAC. The automated brake test is an investment in the future that is already being brought forward today, will work in the long term and will have positive economic effects.

? And the second stage, if you could call it that, the DAC, would then also possibly be cheaper, so that the financial outlay is spread out?

Yes, it would of course make the rollout easier. The costs would of course be spread over various events, so to speak. And yes, there is also less technical risk.

? Are there perhaps technical discussions in this direction so that those who only promote one or the other might also move towards this idea?

There are discussions with us as part of the DAC program. It is now clear to everyone that every single DAC function promoted represents a multi-year development, testing and approval issue. Now that the brake test is available, it is a logical step to use it in the DAC environment. We are pushing the brake test system and are open to cooperation. There are 500,000 existing freight wagons in Europe that are being upgraded with digitisation and automa-

The results of an automatic brake test for the entire train can be read on a handheld device in just a few minutes.



Credits (3): Hermann Schmidendorf



The IoT conference in Cologne – a good forum for the debate on automatic brake testing.

tion. If this is to be implemented in the next ten years, our brake test will be essential.

? Let's move on to other activities of your company. As the PJM Group, you have once again expanded your activities in the areas of acceptance, testing and certification. What has happened recently?

On the one hand, our company focuses on the automation and digitalisation of freight transport. The current key topics are brake monitoring and brake surveillance, even during travel and with locomotive integration. One future system is the IDDS system (Informative Derailment Diagnosis System) for derailment monitoring and prevention. There is particularly great interest in Italy and Switzerland.

The test center has succeeded in developing the measuring wheel set technology to series production readiness. PJM has a test bench in Graz with which we can also dynamically calibrate the measuring wheel sets. PJM has also established itself on the market for pantograph measurement.

? And for the detection of derailments, what exactly happens there?

The IDDS is structured as follows: The electricity is generated via the tried and tested axle bearing generator. The on-board unit with internet and in-train communication as well as the battery system are installed in the system box. Derailment diagno-

sis is carried out based on acceleration on the car body above the bogies. If limit values are exceeded, the train driver is informed in real time (typically < 1 second) via an app. The driver then initiates the necessary operational steps.

? So the train driver can react faster and in a timely manner?

With this information, the train driver can implement the operationally prescribed measures promptly. For example, drive slower, drive to the next station or stop, depending on what the operational integration, which is necessary to be able to operate such a system, negotiates with the responsible positions.

? Would that have helped in the train accident in the Gotthard tunnel?

That would have been particularly helpful there. The aim is that the train driver is informed within about a second that a derailment has occurred. Yes, and the train could then have stopped.

? I interviewed the CEO of SBB on this topic, and he said that the industry does not yet have technology that detects derailment so clearly?

Exactly. Because at that time there was no digital derailment system. We are in the final system verification with our Italian key development partner Mercitalia Intermodal. The aim is to activate the ►

system at our Italian customer this year. Then we will test the stability in the field. Detecting derailments is a highly complex process. But we are working on creating a solution. We are also open to other systems on the market that we can combine with our infrastructure such as power generation and in-train communication.

? That would be extremely positive! And we don't have to wait until the digital automatic coupling and the corresponding finances are available across the board?

A DAC is permanently wired. Whether the information reaches the train driver via a data line or by radio is of secondary importance for the application. Our overall system can already solve this today and can be connected to the DAC in the future. Sensor technology and methodology are fundamentally

comparable. Derailment sensors in digital form can also be used in parallel for other applications.

The data transfer from the wagon to the locomotive would then work via the data line in addition to the radio, provided that the locomotive can be upgraded with an appropriate system solution. The overall DAC system discussed has greater benefits, from simple coupling to higher traction forces and other operational functions. Nothing stands in the way of digitising the wagons today. Our system can already map 80 - 90% of the overall functionality.

! Thank you very much for the interview and good luck!

The interview was conducted by Hermann Schmidten-dorf.



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STADLER

Human Resources • Analysis

HOW MUCH INCOMPETENCE CAN A COMPANY TOLERATE?

Sven Schallach has been working for the HSL Logistics Group since 2011, currently CEO at HSL Netherlands and Sales Director Europe at HSL Logistik GmbH. In this analysis, the logistician shares important insights into company personnel policy. The article was written for a major Dutch newspaper.

In the modern business world, the success of a company depends on a variety of factors: market research, product development, efficient processes and, of course, the people who handle these tasks. But what happens when incompetence comes into play? How much incompetence can a company really tolerate before the negative effects become noticeable?

1. Incompetence at different levels

Incompetence can occur at all levels of a company's hierarchy – from management to operational employees. However, the consequences vary depending on the level and type of incompetence.

At the operational level, incompetence can lead to loss of productivity, quality defects and customer dissatisfaction. If errors and delays accumulate, this can damage the brand image in the long term. At the management level, the effects are often more serious. Bad management decisions have potentially far-reaching consequences: faulty strategies, inadequate investments or ineffective company policies can endanger the entire company. It is particularly dangerous when managers do not recognise that they themselves are part of the problem.

2. Structures and processes as buffers

Well-established companies often have sophisticated processes and structures that can help com-



Photo: Hermann Schmidtendorf

pensate for individual weaknesses. These “buffers” can cushion incompetence in the short term by preventing or at least reducing errors through clear rules and standard procedures.

A good example of this is the introduction of quality management systems and automated processes. Even if individual employees or departments are weak, such systems can detect and correct errors at an early stage. But even the best structures have their limits. If inefficient processes or weak employees are not corrected for a long time, the susceptibility to errors and thus the burden on the entire company increase.

3. The tolerance limit of the corporate culture

The corporate culture plays a decisive role in how much incompetence a company can tolerate. A culture that relies on constant learning, feedback and continuous improvement can identify and eliminate weaknesses more easily. A lack of or incorrect incentives, a fear of conflict or a lack of transparency, on the other hand, lead to incompetence being ignored or even tolerated.

If inefficient employees or managers are not ►



Photo: Martin Prieb/HSL

At home in Europe: HSL locomotives and their trains.

only tolerated but even promoted, a “toxic” culture is created in which competence and performance no longer have any value. The consequences are dwindling motivation, increasing fluctuation and, in the long term, a decline in innovative power.

4. The “Peter Principle” effect

A well-known phenomenon that is often mentioned in this context is the “Peter Principle”. It states that in hierarchical organisations, employees are promoted until they reach a position in which they are incompetent. In large corporations, this can lead to an accumulation of managers who are no longer able to adequately perform their tasks.

The Peter Principle shows that incompetence is not always a result of poor selection or training, but often arises from a misunderstood logic of promotion. This type of incompetence is particularly difficult to correct because the people affected often have considerable power and influence.

5. The costs of incompetence

In the long term, incompetence leads to high costs in a company – both directly and indirectly. Incorrect decisions and inefficient work processes generate additional expenses that reduce profits. At the same time, the potential for innovation suffers because strategic opportunities are not recognised or are incorrectly assessed.

In the worst case, this can lead to the failure of the entire company. There are enough examples of this: from formerly successful companies

that have lost touch due to strategic mistakes to organisations that have been torn apart by internal power struggles because incompetent managers defended their positions.

6. Countermeasures: How companies can reduce incompetence

Reducing incompetence begins with the selection and development of the right employees. Professional talent management, targeted training and a culture of openness and learning are key success factors.

Another important measure is the establishment of clear feedback mechanisms. Regular performance evaluations and open discussions help to identify and address weaknesses at an early stage.

Finally, the willingness to change is also crucial. Incompetence can occur in any company. What is crucial is how one reacts to this: with repression and tolerance or with consistent measures towards improvements.

Conclusion

A company can certainly tolerate a certain amount of incompetence – but not unlimited. The resilience depends heavily on the company culture, the existing structures and the ability to correct oneself.

Companies that ignore or tolerate incompetence not only endanger their short-term success, but also put their entire existence at risk in the long term.

Sven Schallach



To Zero buses: “Zero percent emissions, 100 percent reliability”

The company To Zero in Erfurt/Germany is focusing on the ecological future. It is converting well-preserved diesel buses to electric drives with batteries. A network of partner workshops is to support the expansion of activities. To Zero has so far converted 12-meter buses. A large coach is now also in the works. And an 18-meter articulated bus has now been “greened” for Dortmunder Stadtwerke AG DSW21. It has also received other extras such as an additional fire alarm system. The batteries do not pose any danger, the specialists emphasise. Because a special, non-flammable product is installed. CARGO FREIGHT JOURNAL spoke to the company’s two managing directors.



Credits (3): Hermann Schmidtendorf

Everything is handy and clearly laid out: the electrical equipment of an electric bus converted by To Zero, here with the managing directors Hans-Georg Herb (left) and Andreas Pfeffer.

? **CARGO FREIGHT JOURNAL:** We are standing here in front of the Dortmund articulated bus. Your company name, To Zero, is written on the back. Apart from that, the bus looks the same as always, a MAN Lion’s City. What would normally be behind the rear flap?

Hans-Georg Herb: Normally, the large-volume diesel engine is installed here in the rear of the vehicle.

Andreas Pfeffer: We used to have a lot of mechanics here, the engine alone with 3800 moving parts, with a belt drive and three alternators. Now there is only the set for the alternator, that is our charger, and that is the drive electronics for the servo pump, the compressor and the underfloor. Then there are the battery packs to take the vehicle 200 to 500 kilometers, depending on the battery equipment.

? I have the impression that this equipment has become even more compact again?

Andreas Pfeffer: That is actually the case. We used to have a very large box here in 2019 on our bus that we showed in Brussels. Today everything has become smaller. And we hardly need to dissipate heat anymore. Nevertheless, we are still in the infancy of electromobility. This will continue here too. Three devices are being combined into one. Soon we will have even more space to install batteries.

? What about the manufacturers of these components? Is that a conscious choice, or would every converter automatically say that it can only come from this or that company because there are no other suppliers?

Hans-Georg Herb: No, there is a choice. But there are good, not so good, expensive and not so expensive ▶



There is no visible change from the outside, but this 18-metre bus now runs on electricity.

sive devices. For us, it is primarily about quality and above all about functionality and durability, how long a device like this lasts. In the seven years since we started doing this, we have had to go through many a valley of tears and say goodbye to suppliers. Or they said goodbye to us because they were no longer there and we had to look for new ones. Fortunately, we are now at a level where we can say: Great, we are really happy with that. We have well-known battery manufacturers, a well-known drive manufacturer, well-known component manufacturers, so you can say that the people know what they do and what they are talking about. And you can install these parts there with a clear conscience.

Andreas Pfeffer: It is all very easy to maintain. You may replace these devices in a quarter of an hour. Since there is no mechanical part, I don’t have to do any maintenance, it’s just easy to service. And that’s a future-oriented approach. It’s also clear that things can be improved, that we probably won’t have to discuss a range of 700 kilometers per battery charge any more. But it’s also important that we get started now. The vehicles can then be upgraded at any time.

Hans-Georg Herb: Here at the back of the bus we can see the compressor that supplies the bus with

compressed air so that the braking system continues to function. You can see the heater cooler, normal cooling water, the power steering, and you can see a cooler. And that’s actually what’s special about it, that the entire compartment used to be filled with a cooler, a giant fan. That shows how much energy, how much heat you used to have to get rid of via this cooler. All of that meant losses in performance. Now the cooler is smaller than in a car, but still completely sufficient. If you used to stand by the diesel bus, you would almost get burned. That’s how much heat came out of it.

Andreas Pfeffer: We want to replace as little as possible. Because everything that is in stock and still works can be treated with the old networks in maintenance, in after-sales. We don’t need to talk about a new power steering if we have the old one. Every spare parts dealer knows exactly what kind of pump is needed. We only changed the energy source. It’s the same with the braking system, we’re not touching that. The compressor has been changed, but all the lines in the bus remain. There is a very short connection line that we are replacing. Everything else remains. This means that the technician in the depots does not have to learn anything new, he keeps the old valves, he can even order for the old hoses completely new ones from MAN. ▶

Any standard plug can be used to charge the battery, and the charge level is shown in percent.



And that is exactly the philosophy. Some manufacturers have new electric axles. We have found that the old ones last longer than some of the new ones. Our petition is that we are moving away from “buying new, scrap the old”. Our pitch is that there are 1.4 billion vehicles on this planet with combustion engines. With a focus on resources and the climate, it would be downright absurd to scrap them all and replace them with identical new ones, but then electric. Our approach has advantages for the operator of the bus, but also has advantages on the cost side for us and the offer that we can make. We then do not feel pressured to always use the latest. We first have to build up the trust of the companies that they will get functioning vehicles. At the end of the day, with the electric drive, we are already talking about an efficiency of well over 90%. We’re moving from diesel with 18% to over 90%, and whether I get 94 or 95% is less important. What’s more important to us is that the service is as simple as possible and the durability is as long as possible.

Hans-Georg Herb: Diesel engines require more and more service work when they have done more than 500, 600 or 700,000 kilometres. All of this work is no longer necessary. The same goes for the gearbox – there is no gearbox anymore. So we no longer have to worry about something wearing out on the gearbox, the dual clutch or the automatic. The moving parts that remain are our axles, but they can be overhauled with relatively little effort if necessary. And we have our wheel loaders and the suspension,

which are always replaced on a regular basis. But this also has to be done on a new bus after 150,000 kilometers or even earlier.

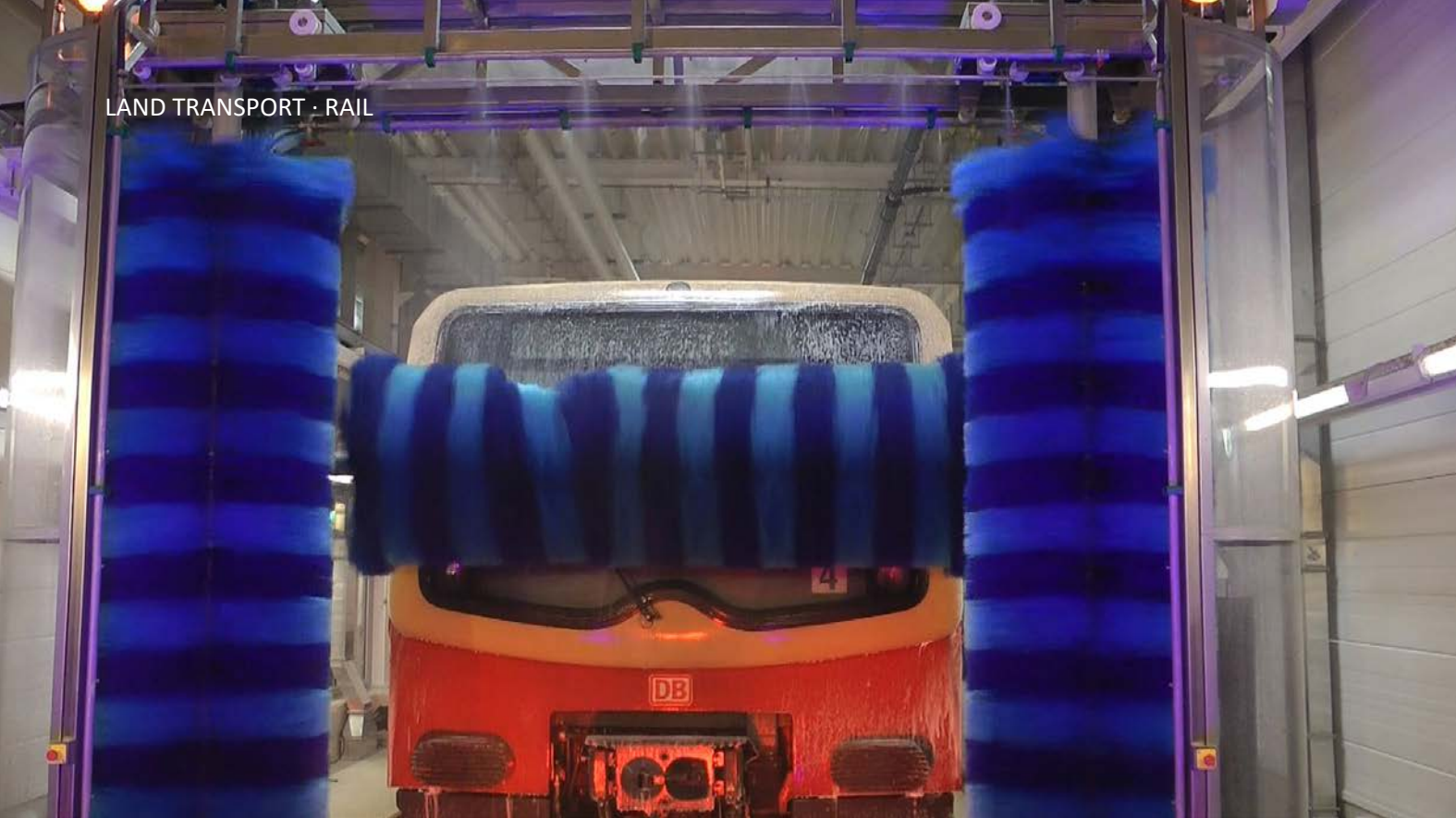
Andreas Pfeffer: The other point is that the rest of the vehicle is then hardly subject to any wear. We are talking about aging, wear and tear due to use. We see that there are differences there. In private companies, a vehicle usually still looks really good after ten years. We often see things differently in big cities. The next point is corrosion. But that is also where we want to move companies and society: not simply accepting that this car is being replaced by a bus with a newer engine that complies with Euro 4, Euro 5 or Euro 6. Instead, it is actually worth looking at the corrosion spots once a year, applying modern corrosion protection to them and thus significantly extending the life of the vehicle.

The oldest vehicle that we have modernised is over 40 years old. It is now used as a sightseeing bus and is in almost better condition than it was when it came out of the factory. That is possible, but that is really the thinking of the next generation. That is what our bus conversion stands for, and that is what we want to spread to the world. To Zero means: zero emissions, 100 percent reliability.

? Many thanks for the informative conversation!

The interview was conducted by Hermann Schmidten-dorf.





Ecological, fast and economical: a washing system for trains, built including the hall and installed by Achat GmbH.

Credits (2): Hermann Schmidtendorf

Achat Ltd.:

TRAIN WASHING SYSTEMS, ELECTRICAL PROJECTS – COMPLEX SOLUTIONS FOR ALL OF EUROPE

At the end of 2016, the Berlin-based company Achat Infrastruktur GmbH was in the spotlight of the rail industry for the first time. The company is a subsidiary of the Polish company AGAT SA. Its business areas include projects of all kinds – from rail technology, energy, telecommunications, project planning, industrial buildings, automation and ecology. The German subsidiary Achat made its debut with the punctual and technically contractually compliant handover of a train washing system built as general contractor for the Berlin S-Bahn at the Lichterfelde site.

The S-Bahn Berlin, which belongs to the DB, was impressed by a state-of-the-art train washing system that the parent company Agat had built in Łódź, Poland, for the maintenance of Stadler trains there. The German clients were not disappointed either. The good result led to Achat winning another tender from S-Bahn Berlin in 2020: for the construction of a train washing facility as general contractor in Berlin-Grünau. Once again, everything from planning to construction of the hall, including all electrical equipment, was in the hands of the Polish-Berlin company. ►

Achat Managing Director Przemysław Bresch has since then relied on the charisma of his reference projects, he explains to CARGO FREIGHT JOURNAL: “During implementation, the approach to solving daily problems was certainly our advantage. I am also sure that if a potential new customer wanted to know what the collaboration with us in Grünau was like, we would receive a positive reference from the client. The partner companies there came from Poland and Germany, from the Berlin area – railway companies, but also typical electrical companies. This daily collaboration has certainly proven to be very good for us. And the people we worked with on the project, the presidents of these companies, should certainly speak well of us to other companies in the future.”

Other completed projects also give cause for positive testimonials. One of Achat’s successful projects in Germany is the experimental A5 Darmstadt – Frankfurt/Main electric motorway for trucks, built under Siemens management, with pantographs for power supply via an overhead electric line. And a typical Achat task in the field of energy and electricity was the laying of a power cable in Hamburg on the premises of one of the factories near the city center.

In Poland, the parent company also carries out orders for railway tracks and overhead electric lines. There, the trains run on a direct current system. This is also used for example by Germany’s western



Przemysław Bresch at his favorite place, the construction site.

neighbours, in the Netherlands. Are you also looking for orders outside Germany? we asked the managing director. Yes, indeed, says Przemysław Bresch. “Of course we want to be active across Europe. We are not just limiting ourselves to Poland, not just to Germany. We are looking for different topics, also abroad, throughout Europe.” *hfs*

30 years of Deutsche Bahn:

A SUCCESSFUL MERGER OF BOTH GERMAN RAILWAYS – AND NEW PRESSING PROBLEMS

At the end of 1989, the state system of the German Democratic Republic collapsed. The East German state was merged with the West German Federal Republic. The logical consequence was the **merger of the (East) German Reichsbahn and the (West) German Bundesbahn to form today's Deutsche Bahn**. On the western side, the civil engineer **Wolfgang Scherz** played a key role in the successful merger of the two railways. Scherz processed his experiences from that time in a **book (see below)**. At that time, both German railways were part of the respective transport ministries. Independent economic calculations and modernisation were necessary.

In a conversation with the editors of our sister magazine rail & mobility, Scherz sees the result as fundamentally positive. But he has objections to some later developments: "The basic structure – it's right, it fits. And this basic structure can always be developed further in a positive way. It might be interesting to combine the organisational charts of the initial structure of Deutsche Bahn AG from January 1, 1994 and the organisational charts of the current structure of the headquarters. I think that there has been a terrible accumulation of organisational units and, as a result, an increase in personnel. I think that today, if we go back to the initial structure, we would have ►



He continues to trust
the DB Board: Federal
Transport Minister Volker
Wissing with DB Cargo
CEO Dr. Sigrid Nikutta.

Credits: Hermann Schmidtdorf

many good ideas about how to save money."

Many other observers see it that way too. For example, the transport scientist **Prof. Dr. Christian Böttger**, a university lecturer at the HTW Berlin. On September 19, 2024, he explained on the radio station Deutschlandfunk: "Now they say we want to save on overhead, and the only thing that is happening in the short term is that seven board members at DB InfraGo are being turned into eight board members. Anecdotaly, you hear that the bureaucracy has gotten worse and worse, not only because there are more and more people, but also because decisions are so fragmented that no one makes decisions anymore and no one is responsible anymore... In the past, there was one person who was responsible and who had the resources to ensure that a train runs, and today there are four or five, and that just makes the structure worse and worse."

Deutsche Bahn should actually be doing well. When it was founded in 1994, the state took over all the debts. Since then, the federal states have financed regional transport from state grants. And due to increased climate awareness and increased costs of car use, the number of train passengers has risen sharply. But in 2023, DB was in deep red numbers – net financial debt amounted to around 34 billion euros. The reasons for this are varied. Above all, over the last 30 years, governments of various stripes have largely left the railway boards alone in making their decisions. The DB was supposed to pay dividends to the state, was supposed to run accident-free and reasonably punctually, and the market would take care of the rest. For decades, the DB received completely insufficient money to invest in the maintenance of the rail network, signaling and switching technology, and train stations. The DB was supposed to go public, so saving money – even in the wrong place – was welcomed by many politicians. In addition, the approval of competing railway companies in passenger and freight transport was a heavy burden for the DB. It could no longer rely on automatically carrying out all the demanded rail services.

Only the organisational structure grew constantly. The DB Group is now said to include around 640 companies. The passenger transport company **ARRIVA** was supposed to generate profits abroad. ARRIVA has since been sold. And the logistics subsidiary and cash cow **DB Schenker** was also sold to the

Danish transport company DSV for 14.3 billion euros on September 13, 2024 in order to reduce the DB's mountain of debt. The financial investor CVC, which would also like to acquire Schenker, has objected to the deal.

The current federal government has doubled investments in repairing the infrastructure and wanted to pledge even more money, but this did not work out due to austerity measures in the federal budget. Federal Transport Minister **Volker Wissing** is now calling for a restructuring plan, the implementation of which he will personally review every three months. However, he still has confidence in the DB board: "A dilapidated and outdated infrastructure cannot be solved through personnel debates." hfs



Wolfgang Scherz,
Auf neuen Gleisen. Die Abwicklung der
Deutschen Reichsbahn

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with illustrations

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Credits: Hermann Schmidtendorf



Hands-on railway technology at iaf 2022 – this will also be available again at the trade fair in 2025.

World premieres, specialist debates and a representative overview of the industry: The VDEI Service GmbH of the Association of German Railway Engineers (VDEI) regularly offers all of this at the world's largest exhibition in the field of track technology and railway construction. There is 15,000 m² of hall space in the "Messe und Congress Centrum Halle Münsterland", 6,000 m² of outdoor space and over 3,000 m of track at the Münster Ost station of the WLE railway company.

The **iaf** wants to bring companies and people together and show the spectrum of this industry. It is about maintenance and construction, promoting young talent and planning security, but also about transport policy and cross-border transport. The **iaf** makes the world of superstructure accessible and

tangible. Stephan Schulte from the **VDEI Superstructure Technical Committee** puts it this way: "The **iaf** impressively shows how masses of steel and high-performance machines are moved. For example, a concrete sleeper weighs 280 to 300 kilos, a meter of rail weighs around 60 kilos – that is "heavy metal" in the truest sense of the word. The **iaf** is a showcase that fascinates far beyond the professional world."

That is why the VDEI also awards the "**VDEI Promotion Prize**" for outstanding work by young engineers. The association wants to use this to specifically promote young engineers in the rail-guided transport sector. The

awarding of the promotion prize is intended to encourage innovative final theses by young engineers from German-speaking countries.

The VDEI expects the submitted works to contain innovative proposals for modernizing existing railway systems and their equipment, as well as for processes for more effective operational processes in the rail transport system. The suggestions are intended to make rail-guided transport even more attractive compared to other modes of transport or private transport. Entries must be received by VDEI-Service GmbH, Invalidenstraße 90, 10115 Berlin, by 4 p.m. on **December 16, 2024**. Information about the trade fair and the sponsorship award as well as registration at: <https://www.iaf-messe.com> hfs

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