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UEEIV



RAILWAY FORUM 2025 NAPOLI

Focus on track

costruzione dei binari

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About the cover image: As simple as LEGO® bricks: The Rhomberg Sersa representative shows a model of a track, with the track in full size behind it.

Semplice come i mattoncini LEGO®: il rappresentante della Rhomberg Sersa mostra un modello di un binario, con il binario a grandezza naturale dietro.

Credits: Hermann Schmidendorf / Rhomberg Sersa.
Graphics and design: Britta Ruge

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- Überprüfung, Wartung, Instandsetzung
- Generalüberholung
- Zwischenuntersuchung
- Zeitnahe unbürokratische Vor-Ort-Hilfe bei Getriebestörungen
- Funktions- und Dichtheits-Prüfstandlauf
- Drehzahlanpassung von Getrieben nach Remotorisierungen
- Ersatzteile: Beschaffung, individuelle Anfertigung

LOKOMOTIVGETRIEBE

RADSÄTZE

MONTAGEEINSÄTZE

INDUSTRIEGETRIEBE

Dear readers!

In November 2024, the Union of European Associations of Railway Engineers (UEEEIV) and its local member associations WTVV and NGS RTE organised a two-day railway congress in Sofia, Bulgaria's capital. This was a fantastic opportunity for members from twelve countries to meet in person and exchange ideas, both professionally and personally. This fosters cohesion among the member associations and simultaneously strengthens their role and impact on the railway world and society.

At that time, with the support of the German member association VDEI and at the initiative of the media partners CARGO FREIGHT JOURNAL (CFJ) and rail & mobility (r&m), the UEEIV was able to publish a special edition of these journals, tailored specifically to the congress. The initiative was well received. We are therefore delighted to present such a special edition again this year!

This time, the focus is on Italy. The annual UEEIV congress takes place in Naples in conjunction with the Italian member association CIFI. Last year's special issue featured articles in English with summaries in Bulgarian. This time, we are also publishing the articles in Italian. This reflects our conviction: We need a common language, but individual national languages are just as important. Europe is unity in diversity!

We are also delighted that our UEEIV member association, CIFI, was the guest of honour at this year's world-leading trade fair for track construction, the iaf, in Münster, Germany. The guest country of the year was Italy. This is also a positive sign for cooperation in Europe. The iaf is organised by the German UEEIV member association, VDEI. The UEEIV was also able to deliver a welcoming address. This strengthens the entire industry, but also our association's work. Track construction is also the topic at this congress in Naples, specifically the slab track system. We wish all participants an exciting conference and our readers an interesting read!



Dr. Jürgen Murach
Vice president VDEI



Hermann Schmidtendorf
editor-in-chief, publisher CFJ/r&m



Dipl.-Ing. Olaf Scholtz-Knobloch
President UEEIV



Credits (4): Hermann Schmidtendorf

The construction site of a railway tunnel on the Sofia-Plovdiv railway line was also part of the congress program in Sofia.
Anche il cantiere di una galleria ferroviaria sulla linea ferroviaria Sofia-Plovdiv faceva parte del programma del congresso a Sofia.

CARI LETTORI!

Nel novembre 2024, l'Unione delle Associazioni Europee degli Ingegneri Ferroviari (UEEEIV) e le sue associazioni locali affiliate WTVV e NGS RTE hanno organizzato un congresso ferroviario di due giorni a Sofia, capitale della Bulgaria. Si è trattato di una

fantastica opportunità per i membri di dodici paesi di incontrarsi di persona e scambiarsi idee, sia a livello professionale che personale. Ciò promuove la coesione tra le associazioni affiliate e, allo stesso tempo, rafforza il loro ruolo e il loro impatto sul mondo ferroviario e sulla società.

In quell'occasione, con il supporto dell'associazione tedesca VDEI e su iniziativa dei media partner CARGO FREIGHT JOURNAL (CFJ) e rail & mobility (r&m), l'UEEIV ha potuto pubblicare un'edizione speciale di queste riviste, appositamente studiata per il congresso. L'iniziativa è stata molto apprezzata. Siamo quindi lieti di presentare anche quest'anno un'edizione speciale di questo tipo!

Questa volta, l'attenzione è rivolta all'Italia. Il congresso annuale dell'UEEIV si terrà a Napoli in collaborazione con l'associazione italiana CIFI. L'anno scorso, il numero speciale conteneva articoli in inglese con riassunti in bulgaro. Questa volta pubblichiamo gli articoli anche in italiano. Questo riflette la nostra convinzione: abbiamo bisogno di una lingua comune, ma le singole lingue nazionali sono altrettanto importanti. L'Europa è unità nella diversità!

Siamo inoltre lieti che la nostra associazione membro dell'UEEIV, CIFI, sia stata l'ospite d'onore alla fiera leader mondiale per la costruzione di binari, l'IAF, di quest'anno a Münster, in Germania. Il Paese ospite dell'anno è stata l'Italia. Anche questo è un segnale positivo per la cooperazione in Europa. L'IAF è organizzata dall'associazione tedesca membro dell'UEEIV, VDEI. L'UEEIV ha anche potuto tenere un discorso di benvenuto. Questo rafforza l'intero settore, ma anche il lavoro della nostra associazione. La costruzione di binari è anche il tema di questo congresso a Napoli, in particolare il sistema di binari a soletta. Auguriamo a tutti i partecipanti un convegno entusiasmante e ai nostri lettori una lettura stimolante!

Dr. Jürgen Murach
Vicepresidente VDEI

Hermann Schmidtendorf
Caporedattore, Editore CFJ/r&m

Dipl.-Ing. Olaf Scholtz-Knobloch
Presidente UEEIV

Sleeper pads in track construction: “Less tamping, longer railway track lifespan”



Dipl.-Ing. Andreas Wenz

Credits (3): Getzner Werkstoffe GmbH

Track construction was also one of the topics at the UEEIV-RAILWAY FORUM 2024 in Sofia. Andreas Wenz, project engineer at Getzner Werkstoffe's Munich branch, spoke about this. Our editorial team spoke with the engineer.

? **CARGO FREIGHT JOURNAL/rail & mobility:** I found your presentation at the Railway Forum very interesting because you explained to us that it's possible to maintain a railway line in good condition without having to have ballast machines tamping it on a very frequent basis. However, to do this, certain things obviously have to be done in a timely manner. Please explain. What's the deal with the pads—that's probably what they're called in English—that you talked about here?

Andreas Wenz: In English, they're called “under sleeper pads”. Ultimately, the mechanism is that the contact area between the sleeper and the ballast is increased, which in return reduces the pressure and stress acting on the ballast.

What happens is simply that the ballast is subjected to less stress and therefore less damage. The ballast bed remains more stable because lower forces are applied per support point. This increases its service life, and maintenance intervals are extended because the ballast bed doesn't have to absorb high dynamic forces.

? How should I imagine this in practice? Does a base like this have upward-sloping edges to prevent it from slipping sideways? If I just put some-

thing underneath it, it probably won't last long?

The USP is not simply attached underneath the sleeper. Instead, it is firmly embedded into the sleeper itself. While the concrete is still wet, the under sleeper pad is positioned onto the sleeper. As the concrete hardens, it secures the pad in place, making it an integral part of the sleeper that cannot be removed.

? And what thickness is recommended for each sleeper type?

That really depends on the installation conditions and the specific application. You have to consider the subsoil, the ballast, and also the type and volume of traffic expected on the line. Typically, we're talking about thicknesses ranging from seven or eight millimetres up to a maximum of 15 millimetres. So, the sleeper pads being installed aren't particularly thick.

? So the infrastructure company commissioning a construction project must know from the outset that this is happening, must want it, and then must also order it from the sleeper manufacturers?

Exactly. Railway companies usually have techni- ►

cal departments that are informed about the functionality and can consider it in advance. They would like to incorporate this measure into either the new construction or the renovation of a line. And then, accordingly, this is also specified in the tender for sleeper procurement, ensuring that only padded sleepers are supplied.

? But these pads are already so stable against mechanical stress that they can be installed even with modern construction trains without causing scratches and cracks?

Absolutely. There are very strict testing standards that must be met as part of quality control and product qualification. These standards specify that under sleeper pads must withstand defined loads without cracking, breaking, or tearing. Otherwise, they can't be approved for use on the track.

In fact, this extends the service life of the track. So, we're not just talking about the typical lifespan of a sleeper – we're going beyond that. It's a mechanical challenge, no doubt, but one that can be fully solved.

? What service life can you specify? Are there any one-to-one lifetime reports, or is it tested in the laboratory?

Both. There are laboratory tests that simulate the accelerated ageing of the sleeper and extrapolations that estimate how long under sleeper pads remain

fit for use. On top of that, we also have decades of real-world experience from track operations. So, we can say with confidence, that the under sleeper pad will definitely remain intact longer than the usual service life planned for a track today.

? You mentioned a very low price per sleeper, so that's not such a significant additional cost factor. And you're referring to a curve where, at a certain point, only the infrastructure will be profitable for the financial budget?

Of course, there's a certain initial investment involved. But it's necessary to look at the long-term perspective, over the full lifetime of this track. Then you can clearly calculate savings from the reduced maintenance efforts. Those savings can be used at other places, where the money would also be needed.

? And what about recycling? After all, that's an additional material connected to the sleeper. So what do you do when its service life is over?

That is absolutely right – it's definitely an issue we're looking into. We have to find processes to separate the under sleeper pad from the sleeper. This already works to some extent with the concrete crushing, but it does require effort to sort the material afterwards. As a company, we are currently working on both mechanical and chemical recycling for old polyurethane materials, which we want to completely convert back into new raw materials. That would ►



More information is available via this DMC code.

Ulteriori informazioni sono disponibili tramite questo codice DMC.

be absolute cradle-to-cradle recycling – not just downcycling – so the materials can be reused. Theoretically, if the sleeper itself is still in good condition, it can be reused somewhere else. The critical point is the concrete rather than the pad.

? How would you define the savings resulting from the reduced need for ballast tamping?

Tamping will certainly continue. We are not reducing the forces to zero. There will still be dynamic loads acting on the track, and over time, these will naturally have an impact on the ballast bed. But by using the right under sleeper pads, it has been proven – particularly through very extensive experience from the Austrian network – that it's quite possible to double the tamping intervals. The bottom line is that one tamping cycle can be eliminated from the original maintenance schedule – resulting in a clear saving per maintenance unit.

? So, can we say that ÖBB's infrastructure is already actively using this method?

Absolutely. At ÖBB, the use of these padded sleepers is an absolute standard, as is the case with several other European railway operators. Deutsche Bahn already uses sleeper pads across large parts of its network, as well as Italy, France, and other countries. This is definitely already an established standard. The question is: How quickly will this approach expand across Europe?

? For which type of routes would you primarily recommend the pads? High-speed, conventional rail traffic, possibly branch lines, possibly trams – where will the best possible effect be achieved?

Of course, the best results are achieved where the greatest loads occur. We're talking about high-speed lines, heavy-haul lines and busy routes. Wherever the highest forces, the most trains, are on the move, that's where maintenance measures are needed soonest. That's where it's most profitable to extend these intervals. And that's exactly what the LCC studies from the Acoustics Competence Centre at Graz University of Technology showed. This curve

rises! This internal rate of return increases the more heavily the route is loaded.

? So it's not necessarily necessary for trams?

With trams, the load on the ballast isn't that high anyway. So, this might not be the most suitable route for it, but rather anything with high loads.

? Could this possibly also have a positive effect on the overall noise level?

That can't be answered in general terms. There are studies that say yes, and there are other studies that say no. Fundamentally, I can't see a 100% connection between the track padding and the perceived noise.

? Is your system also being used in Deutsche Bahn's current general renovations? They say that after such a general renovation, you don't have to do anything to the track for five years?

"Nothing at all on the track" sounds utopian to me. But of course, there's a legitimate interest in keeping maintenance as low as possible. And Deutsche Bahn is definitely one of our regular customers. The benefits are well recognized and they are being implemented in their network.

? At the UEEIV-RAILWAY FORUM in Sofia, you're speaking in a region that will hopefully invest more heavily in the railway in the coming years. Do you expect this to find fertile ground if such information is presented broadly enough?

I certainly hope so. In fact, there are already some routes in Sofia where the measure is being tested and the results so far are quite promising.

? Thank you very much for the interview!

The interview was conducted by Hermann Schmidendorf.

ABSTRACTS

Cuscini per traversine nella costruzione dei binari:

“Meno lavoro di rinforzatura, maggiore durata dei binari ferroviari”

La costruzione dei binari è stata anche uno dei temi trattati al FORUM FERROVIARIO UEEIV 2024 di Sofia. Andreas Wenz, ingegnere di progetto presso la filiale di Monaco di Geßner Werkstoffe, ne ha parlato. La nostra redazione ha parlato con l'ingegnere.

I materassini per traverse aumentano la superficie di contatto tra la traversa e il pietrisco del binario. Questo riduce la pressione esercitata sul pietrisco. Il letto di pietrisco rimane intatto perché vengono applicate meno forze per punto di appoggio. Questo può aumentare la durata utile. Anche gli intervalli di manutenzione si allungano perché il letto di pietrisco non deve assorbire così tante forze dinamiche. Il materassino è integrato in modo permanente nella traversa. Il suo spessore è tipicamente compreso tra 7 e 17 millimetri. Pertanto, i materassini per traverse utilizzati non sono particolarmente spessi.

Esistono anche test di laboratorio che esaminano il carico accelerato della traversa. Esistono estrapolazioni riguardo al periodo di idoneità di questi materassini per traverse. E c'è anche esperienza con il binario maturata in diversi decenni. Quindi possiamo affermare con certezza che il materassino della traversina rimarrà sicuramente intatto più a lungo della normale durata di vita prevista per un binario oggi. È necessario adottare una visione a lungo termine, per l'intera durata di vita di questo binario. In questo modo, posso calcolare i risparmi effettivamente derivanti dalla riduzione degli interventi di manutenzione, che potrei poi utilizzare per altri settori in cui il denaro è necessario.

Ma grazie a questo prolungamento degli intervalli di rinalzatura, che è stato dimostrato, almeno sulla base della vasta esperienza della rete austriaca, è possibile raddoppiare gli intervalli di sosta. Il risultato finale è chiaramente il risparmio di un processo di rinalzatura per unità di manutenzione. Bisogna trovare processi per separare nuovamente il materassino dalla traversina. Questo funziona già in una certa misura con la frantumazione del calcestruzzo. Bisogna solo impegnarsi a separarlo in seguito. Come azienda, stiamo attualmente lavorando al riciclaggio chimico dei vecchi materiali poliuretanici, che vogliamo riconvertire completamente in nuovi materiali.

L'utilizzo di queste traverse è uno standard assoluto per ÖBB, come per molte altre aziende di trasporto europee. Deutsche Bahn utilizza già i materassini per traverse in gran parte della sua rete, così come in Italia, Francia e altri paesi. Ovunque ci siano più forze e più treni in movimento, gli interventi di manutenzione sono più rapidi. È lì che è naturalmente più redditizio prolungare questi intervalli. Ed è esattamente ciò che hanno dimostrato gli studi ACC del Centro di Competenza Acustica dell'Università Tecnica di Graz. Questa curva è in crescita! Questo tasso interno di rendimento aumenta con l'aumentare del carico sulla linea.

L'intervista è stata condotta da Hermann Schmidendorf.

Here you can clearly see: There is a sole underneath the concrete sleeper.

Qui si può vedere chiaramente: c'è una soletta sotto la traversina di cemento.



Slab track, IVES, LEGO®:

BUILD TRACKS QUICKLY AND SAFELY WITH RHOMBERG SERSA IVES

Since January 2024, Stefan Vonbun has been Head of Superstructure Products at Rhomberg Sersa Bahtech GmbH in Bregenz, Austria. In this function, he is globally responsible for Sales, Product Management and R&D of IVES slab track systems well as V-TRAS transition modules.

Stefan is quite busy promoting the new developments of Rhomberg Sersa: at the 66th Track Construction Conference of the Association of German Railway Engineers (VDEI) in March 2025, he gave a presentation entitled “LEGO® Style Track Construction: the IVES Slab Track System.” Stefan also spoke at the iaf 2025 trade fair organised by the VDEI and at the 7th UEEIV Railway Talk on September 11, 2024.

A clever visualisation: Stefan Vonbun and his “LEGO®” track construction model.

Una visualizzazione intelligente: Stefan Vonbun e il suo modello di costruzione di binari “LEGO®”.



Credits: Hermann Schmidtendorf

At the annual Autodesk RAIL SUMMIT in Copenhagen, I met an inspiring, relaxed Stefan. Here, too, he immediately piqued interest with his lego track model, which he held in his hands, and his slogan: “Our modular track construction system is as easy to build as a building with LEGO® bricks.”

The innovative slab track solution that Stefan presented is called IVES. “The IVES slab track system was developed with both modularity, high construction quality and automation potential in mind”, explains Stefan. The process starts with the construction of an asphalt base layer, harnessing the advantages of this quick to build construction material, that is fast-curing, can be worked with even in temperatures where concreting is a hazard and proves to be long-lasting. In curves the asphalt layer is executed in a wedge shape (laterally), to create superelevation (cant). “The next step is the installation

of pre-fabricated concrete blocks, that can be manufactured with pre-stressed and non-stressed reinforcement. These building blocks can be thought of as supersized LEGO® bricks.”

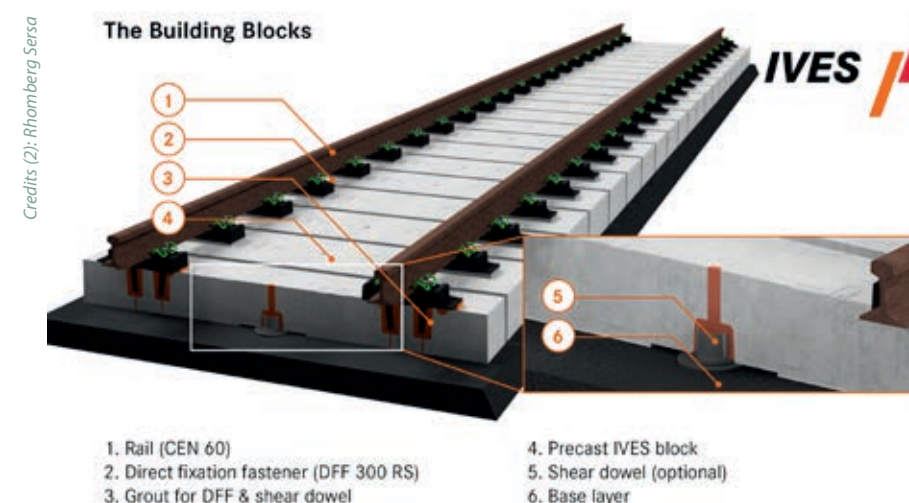
The next step is what Stefan calls “top-down” construction method: “an especially developed direct fastening system (Vossloh DFF 300 RS), that is based on one of the most successful slab track fasteners, the system 300 fastener, is used to construct track panels depending on the length of the rails used. The panels are very accurately positioned with a track adjustment system, enabling high accuracy. While resting on the adjustment system spindles, the track can be used for logistics by construction vehicles up to a certain tonnage. Once the final position is confirmed by surveyors, the direct fasteners are permanently bonded to the blocks ►



with fast-curing cementitious or epoxy grouts. Stefan emphasises that the system has proven itself well in various parts of the world on high-load routes, in tunnels and on bridges. The system has recently received general approval of the German Federal Railway Authority (EBA) and is thus allowed to be used in the network of Deutsche Bahn. In a heavy haul track in Australia the IVES system has been in operation since 2017, has endured more than 1200 MGT (million gross tonnes) and is still performing well. In European mainline tracks with typical annual loads of

20 MGT this tonnage would only be reached after at least sixty years, which is also the design life requirement in many networks for slab track. The Australian projects therefore clearly highlights the quality and longevity of the system. And: **“Dismantling at the end of the service life is much easier than with monolithic construction methods – an important feature for future recycling management and the circular economy.”** This is an interesting system – and Stefan is a perfect ambassador for his solution!

Hermann Schmidtendorf



Standard version of the IVES system as installed in the Asfordby tunnel (picture above) of the Old Dalby test track in 2014. The main components of the system (picture left).

Versione standard del sistema IVES installato nel tunnel di Asfordby della linea ferroviaria Midland nel 2014.

ABSTRACTS

Slab track, IVES, LEGO®:

Costruire binari in modo rapido e sicuro con Rhomberg Sersa Ives

Da gennaio 2024, Stefan Vonbun è Responsabile Prodotti Sovrastruttura presso Rhomberg Sersa Bahtech GmbH a Bregenz, in Austria. In questa posizione, è responsabile a livello globale delle vendite, della gestione prodotti e della ricerca e sviluppo dei sistemi di binari a soletta Ives e dei moduli di transizione V-TRAS. Stefan è molto impegnato a promuovere i nuovi sviluppi di Rhomberg Sersa: alla 66a Conferenza sulla Costruzione di Binari dell'Associazione degli Ingegneri Ferroviari Tedeschi (VDEI) nel marzo 2025, ha tenuto una presentazione dal titolo "Costruzione di Binari in Stile LEGO®: il Sistema di Binari a Sole Ives". Stefan è intervenuto anche alla fiera iaf 2025 organizzata dalla VDEI e al 7° UEIV Railway Talk l'11 settembre 2024.

All'annuale Autodesk RAIL SUMMIT di Copenaghen, ho incontrato uno Stefan stimolante e rilassato. Anche in questo caso, ha subito suscitato interesse con il suo modello di binario Lego, che teneva tra le mani, e il suo slogan: "Il nostro sistema di costruzione di binari modulari è facile da costruire come un edificio con i mattoncini LEGO®". L'innovativa soluzione di binario a soletta presentata da Stefan si chiama Ives.

"Il sistema di binario a soletta Ives è stato sviluppato tenendo conto sia della modularità, dell'elevata qualità costruttiva e del potenziale di automazione", spiega Stefan. Il processo inizia con la costruzione di uno strato di base in asfalto, sfruttando i vantaggi di questo materiale da costruzione rapido da realizzare, a presa rapida, lavorabile anche a temperature in cui la gettata di calcestruzzo è rischiosa e che si dimostra durevole.

In curva, lo strato di asfalto viene realizzato a forma di cuneo (lateralmente), per creare una sopraelevazione (inclinazione). "Il passo successivo è l'installazione di blocchi di calcestruzzo prefabbricati, che possono essere realizzati con armatura precompressa e non. Questi blocchi possono essere considerati mattoncini LEGO® di grandi dimensioni". Il passo successivo è quello che Stefan chiama metodo di costruzione "top-down": "Un sistema di fissaggio diretto appositamente sviluppato (Vossloh DFF 300 RS), basato su uno dei fissaggi per binari a soletta di maggior successo, il sistema di fissaggio 300, viene utilizzato per costruire i pannelli dei binari in base alla lunghezza delle rotaie utilizzate. I pannelli vengono posizionati con estrema precisione tramite un sistema di regolazione del binario, che consente un'elevata precisione. Mentre poggia sui perni del sistema di regolazione, il binario può essere utilizzato per la logistica da veicoli da costruzione fino a un certo tonnellaggio. Una volta confermata la posizione finale dai periti, i fissaggi diretti vengono incollati in modo permanente ai blocchi con malte cementizie o epossidiche a presa rapida.

Stefan sottolinea che il sistema si è dimostrato efficace in varie parti del mondo su tratte ad alto carico, in gallerie e su ponti. Il sistema ha recentemente ricevuto l'approvazione generale dell'Autorità Ferroviaria Federale Tedesca (EBA) e può quindi essere utilizzato nella rete della Deutsche Bahn. In un binario per trasporto pesante in Australia, il sistema Ives è in funzione dal 2017, ha supportato oltre 1200 MGT (milioni di tonnellate lorde) e continua a funzionare bene. Nelle linee ferroviarie principali europee, con carichi annui tipici di 20 MGT, questo tonnellaggio verrebbe raggiunto solo dopo almeno sessant'anni, che è anche il requisito di vita utile previsto in molte reti per binari a soletta. I progetti australiani evidenziano quindi chiaramente la qualità e la longevità del sistema. E: "Lo smantellamento al termine della vita utile è molto più semplice rispetto ai metodi di costruzione monolitici, una caratteristica importante per la futura gestione del riciclaggio e l'economia circolare". Questo è un sistema interessante e Stefan è un perfetto ambasciatore per la sua soluzione!

Hermann Schmidtendorf



Isn't that cute...? A demonstration train was even built with LEGO® elements for a video.

Non è carino...? È stato persino costruito un treno dimostrativo con elementi LEGO® per un video.

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WIR SETZEN DEN NORDEN UNTER STROM


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80 years of MATISA track construction machines: “MATISAre” with dynamism, reliability and a pragmatic ingenuity

The track construction machine manufacturer MATISA is headquartered in Switzerland and has eight subsidiaries, numerous partners, and agents on several continents. In Italy there is a subsidiary in Pomezia/Santa Palomba (RM). At the IAF Trade Fair, our editorial team spoke with the product director at MATISA, Dr. Amorosi.

? CARGO FREIGHT JOURNAL/rail & mobility: Dr. Amorosi, your company is celebrating its 80th anniversary this year. It was founded in 1945 – a year when people were suffering from the great catastrophe at the end of World War II. What was the reason for founding MATISA?

Dr. Simone Amorosi: Back then, there was a lot of construction and repair work to be done on the railways. Our goal was also – and this fits well with today's world – to relieve people of the manual labour on construction sites. They worked directly with pickaxes on the ballast to compact it under the sleepers. **The founders of MATISA and other manufacturers had the idea of relieving people of this tedious manual labour and industrialising these activities.**

Thus, our first standard tamping machine was born. And we never stopped automating our machines, for example with ballast cleaner, right after that war. And then there were other machines, like a very complex track renewal train in the 1970s with functions like changing sleepers and rails. Today we also have a train, a P 95 T that can change ballast, sleepers, and rails – three things simultaneously and continuously. The idea is that these trains function like a mobile workshop. Our goal remains to relieve people of practical, manual, and repetitive work and have it done by robots and machines.

? Is that perhaps also the idea behind your slogan “To make complex processes less complex”? Your machines are becoming increasingly complex, but their operation is becoming less complex?

Exactly. That's the key. **Operation and maintenance should be as simple as possible.** This is directly related to the costs for our customers and also has a positive impact on the reliability of our product. Simple is robust. Compared to the competition, this is a key theme for us. Our machines are more compact, lighter, and simpler, consume less power, they have less electronics. Digitalisation is necessary, but it also brings complexity, which in turn creates certain weak points in the system. That's why we add new functions where necessary to extend the service life. We've been around for 80 years. We want to be around for another 80 or 100 years so that, together with our partners and customers, we can not only sell a machine but also help them use it for 20 or 30 years, because our products are so robust that they last a very long time. That doesn't mean we're not tech-savvy. But **we only use what's necessary to create added value for the customer. Innovation is not an end in itself.**

? You're talking about maintenance. Some countries are very large. If you work in the south and have a workshop in the north, it's difficult to drive back and forth for an inspection. In this case, you want to have a reliable machine that ►



A dynamic conversation partner: Dr. Simone Amorosi. Un interlocutore dinamico: Dr. Simone Amorosi.

doesn't require anyone to travel from the north with equipment. You also don't want to wait days for a spare part because the service department is closed on Saturdays and Sundays?

Exactly. Our customers – both public and private – require machine availability of almost 99%. **Therefore, the machine must be robust, and we must support them by replacing spare parts or repairing the machine as needed. Our service is capable of responding very quickly worldwide. Our new machines are connected to the internet. So, if a problem occurs with the machine, or even before it occurs, we already know there's a problem.** We can communicate with our customers and take action before a breakdown occurs. This is possible because the machine is not only connected to the internet but also, via the connection box, acts as a link to all of the machine's internal neural sensors, positioned at key locations individually defined by the customer, preventing any impending problem. This enables predictive maintenance, but also gives the customer control. They can check the machine's location, fuel consumption, and battery energy consumption on their computer or by smartphone. Not only that – the wear on the tamping tines is also displayed. When they need to be replaced, customers can react proactively and order new tines directly via the app at the touch of a button. In this way, digitalisation simplifies the operation and maintenance of the machine.

? Do you offer training for operators and maintenance personnel?

The offer depends on the crew and their experience. **We offer training at various levels, both in handling the machine itself and in taking measurements on simulators, because measurements are crucial.** Why? Infrastructure companies, which are often our customers, increasingly expect proof of proper execution at the end of a contract today and in the coming years. Infrastructure inspectors will increasingly rarely leave their offices and go to the construction site to inspect. Today, they inspect, even in a very hands-on manner. Tomorrow, they will demand and certify a report. So, crews need to be trained not only in handling the machine, but also in using the tool evaluation system and the measurement system before and after the job to ensure the report is created correctly. New skills are therefore required, including with regard to digitalisation. The new crews will not only be experts in ballast processing, but also in IT, which represents a major shift in mindset. We are seeing a shift from mechanics, which will of course continue, to more digitalisation. You must be proficient in software interfaces and computers, as you will need to send reports to inspectors at the end of a job.

? There are differences depending on the country and the standards and norms of a particular railway. Your homologation department needs to be aware of these differences to be able to confirm that everything is in order. So, you're constantly checking the standards and changes to the regulations of a particular infrastructure so that you can supply it accordingly? ►



A MATS station for guidance with absolute geometry.
Una stazione MATS per la guida con geometria assoluta.

Credits (2): MATISA

Yes. **We have an approval service with numerous approval engineers who specialise in monitoring the evolution of standards and closely analysing the specifics of each country.** European standards are built up in layers. The European level is set by Brussels. But that's not all. Local decisions are also historically determined. Every infrastructure has slight differences – the track gauge, sometimes the loading gauge, the overhead line voltage, etc. You have to specialise for each country. Reporting can also be slightly different, as each country places more emphasis on one aspect than another. We have to keep an eye on the regulations because our customers want a roadworthy, approved machine.

? Can you give examples of the different track gauges for which you offer machines?

Our headquarter is in Switzerland. There, we have the standard European gauge, but also the metric gauge. In Spain, in addition to the European standard gauge for high-speed trains, we also have a wider and a metric gauge. In Ireland, there is a slightly narrower gauge. In Ukraine, which is also one of our customers, the gauge is again different. **Our machines are highly adaptable. We have models for metric gauges. And we also have machines with variable gauges, for example, for Spain, where you can switch from the standard gauge to a wider gauge.** We don't even want to mention the rest of the world. Australia is the most complex because it is a continent and has different countries with different rules.

? And what about the USA, where everyone should now have their own production in order to be able to offer good prices?

We just delivered our first P 95, a renewal train, in the US to our institutional customer Amtrak. It was a great success. It's a large machine with state-of-the-art induction rail heating technology. We know the market and want to continue expanding. Even if new situations arise – the situation you mentioned with the current presidential ad-

ministration and its tariffs is probably only a marginal phenomenon for our industry, as we have quite long cycles. Therefore, we continue to communicate with our key people on site and are open to sales opportunities in the US and North America.

? How often do you change fundamental design parameters? Energy supply, for example, is a major issue. Diesel engines are no longer as popular, which is why alternative fuels such as HVO (Hydro treated Vegetable Oils) could be used. Switzerland is particularly interested in particulate filters. Or would batteries be a viable option? Where are you headed?

Thank you for this question – it's a very relevant topic. We believe the diesel engine still has a future. Before switching to costly and not necessarily more environmentally friendly electric or hybrid solutions, such as those proposed by some of our competitors, we first want to ensure that diesel configurations are optimised to their full potential.

With our NEO (New Energy Optimisation) Active machines – the B 66 UC and UC-D NEO Active – we have rethought how diesel power is used. Instead of relying on a single large engine that runs continuously, we have divided the power source into two smaller diesel generators. Only one generator operates when the full power is not required, which significantly reduces both fuel consumption and environmental impact. ►

In addition, we are optimising the entire hydraulic system to further cut emissions. These improvements together allow us to reduce key performance indicators – particularly CO₂ emissions – by about 30% compared to the previous model.

We have compared these results with those of a hybrid machine performing the same tasks. And you know what? When you look at the entire life cycle of a machine – from the steel used in its structure to its last day of operation and dismantling – the picture changes.

Our competitors' machines are comparable to ours in function, but they often contain up to 50% more steel mass. That means more energy is needed not only to move that weight during operation, but also to produce it in the first place. When you calculate the true environmental footprint, you have to consider the energy mix of each country's electricity generation as well.

Finally, it's also important to look at real operating conditions. In some countries, for safety reasons, overhead lines must be switched off during track maintenance work. So even if a machine is equipped with an electric drive, it cannot use it in those situations and must rely on the diesel engine anyway. In that sense, our optimised diesel concept remains one of the most practical and efficient solutions currently available.

? Aren't diesel fuel substitutes still quite expensive?

We consider HVO as a smart solution. It's more expensive, yes, but it's already available. Ad-Blue® systems and particulate filters are already standard on our machines, and we need to continue moving in that direction.

There are still ways to further reduce CO₂ emissions from diesel engines. One day, we'll probably integrate batteries – once they become compact and powerful enough. In that sense, diesel engines still have a second and even a third life ahead of them.

? How would you briefly characterise your philosophy?

Our values are dynamism, reliability, and pragmatic ingenuity. Pragmatism and ingenuity are important. We must find good, reliable solutions for long-lasting machines. And we are dynamic because we respond quickly and competently to our customers' needs.

The railway is a way to overcome borders and create peace. It is also an example of the sensible use of energy for transportation, as it can transport many people in a short time. It is one of the best means of transport in the world compared to cars and airplanes, which consume significantly more energy and cause environmental damage.

? What is your presence in Italy?

“ITALY IS OUR MAIN MARKET!”

There are currently over 250 machines in operation in Italy. Almost all of the track renewal trains in Italy are made by MATISA. Our local staff told me that there's now a new verb in Italian: “MATISAre.” This is, of course, a made-up word. Regardless of the manufacturer of a machine, “MATISAre” is now a synonym for track work!

? Congratulations! It's probably the greatest marketing success for a company: when its brand or company name becomes synonymous with all comparable products in a given industry. I remember that many years ago, the first imported photocopiers in Poland were made by Xerox. Since then, many Poles have used the phrase “to make a Xerox” instead of “to make a photocopy” – even though they've never heard of this manufacturer. That's fantastic! Speaking of Poland: Are your machines also in operation there?

Yes. We are represented in Poland, in particular, with a renewal train. We are currently negotiating new contracts for the future. We are therefore very interested in continuing to operate in Poland.

! Thank you for the detailed interview!

The interview was conducted by Hermann Schmidten-dorf.

INTERVISTA

80 anni di macchine per la costruzione di binari MATISA:
“MATISARE” CON DINAMISMO, AFFIDABILITÀ E INGEGNO PRAGMATICO

Il produttore di macchine per la costruzione di binari MATISA ha sede in Svizzera e conta otto filiali, numerosi partner e agenti in diversi continenti. In Italia ha una filiale a Pomezia (RM). In occasione della fiera IAF, la nostra redazione ha parlato con il Direttore Prodotto MATISA, il Dott. Simone Amorosi. Nel 2025, MATISA festeggia il suo 80° anniversario. Gli abbiamo chiesto qual è stato il motivo della sua fondazione.

Simone Amorosi: All'epoca della sua fondazione nel 1945, c'erano molti lavori di costruzione e riparazione da svolgere sulle ferrovie. **Il nostro obiettivo era già quello di alleggerire il lavoro manuale nei cantieri.** Gli operai lavoravano direttamente con i picconi sul pietrisco per compattarlo sotto le traversine. Così è nata la nostra prima rinalzatrice la Standard. E non abbiamo mai smesso di automatizzare le nostre macchine, ad esempio con la risanatrice di pietrisco, subito dopo la guerra.

? CARGO FREIGHT JOURNAL/rail & mobility: È forse questa anche l'idea alla base del vostro slogan **“Rendere i processi complessi meno complessi”**? Le vostre macchine stanno diventando sempre più complesse, ma il loro funzionamento sta diventando meno complesso?

Esatto. Questa è la chiave. **Il funzionamento e la manutenzione devono essere il più semplici possibile. Questo è direttamente correlato ai costi per i nostri clienti e ha anche un impatto positivo sull'affidabilità del nostro prodotto. La semplicità è sinonimo di robustezza.** Le nostre macchine sono più compatte, più leggere e più semplici, consumano meno energia e hanno meno componenti elettronici. La digitalizzazione è necessaria, ma porta anche complessità, che a sua volta crea alcuni punti deboli nel sistema. Ecco perché aggiungiamo nuove funzioni dove necessario per prolungarne la durata. Siamo sul mercato da 80 anni. Vogliamo continuare a esistere per altri 80 o 100 anni, così da poter, insieme ai nostri partner e clienti, non solo vendere una macchina, ma anche aiutarli a utilizzarla per 20 o 30 anni, perché i nostri prodotti sono così robusti che durano a lungo. Questo non significa che non siamo esperti di tecnologia. **Ma utilizziamo solo ciò che è necessario per creare valore aggiunto per il cliente. L'innovazione non è fine a se stessa.**

I nostri clienti, sia pubblici che privati, richiedono una disponibilità delle macchine pari a 99%. Pertanto, la

macchina deve essere robusta e noi dobbiamo aiutarli fornendo i pezzi di ricambio o un servizio di riparazione secondo necessità. Il nostro servizio di assistenza è in grado di rispondere molto rapidamente in tutto il mondo. Le nostre nuove macchine sono connesse a Internet. Quindi, se si verifica un problema con la macchina, o anche prima che si verifichi, sappiamo che dobbiamo agire. Questo perché la macchina non solo è connessa a Internet, ma, tramite il dispositivo di connessione, funge anche da collegamento a tutti i sensori interni della macchina in punti definiti individualmente insieme al cliente, prevenendo un problema imminente. Ciò consente la manutenzione predittiva, ma anche il controllo da parte del cliente cliente. Offriamo formazione a vari livelli, sia sulla gestione della macchina stessa che sulle misure simulate. Stiamo assistendo a un passaggio da un mestiere basato sulla meccanica, che ovviamente continuerà, a una profonda digitalizzazione. È necessario avere competenze nell'uso di interfacce software e nel pilotaggio a distanza degli attrezzi, visto che sarà obbligatorio inviare un rapporto di misura agli ispettori al termine di un lavoro.

? **Esistono differenze a seconda delle norme del paese analizzato.** Il vostro Dipartimento Omologazione deve essere a conoscenza di queste differenze per poter confermare che tutto sia in regola?

Sì. **Disponiamo di un servizio di approvazione con numerosi ingegneri specializzati nel monitoraggio dell'evoluzione degli standard e nell'analisi approfondita delle specificità di ciascun paese.** Il livello europeo è stabilito da Bruxelles. Ma non è tutto. Anche le decisioni locali sono storicamente determinate. Ogni infrastruttura presenta lievi differenze: lo scartamento dei binari, a volte la sagoma di carico, la tensione della linea aerea, ecc. È necessario specializzarsi per ogni paese. Anche la reportistica può essere leggermente diversa, poiché ogni paese pone maggiore enfasi su un aspetto rispetto a un altro. La no- ►



*80 years of MATISA. This universal tamping machine is one of the company's most modern products.
 80 anni di MATISA. Questa macchina rinalzatrice universale è uno dei prodotti più moderni dell'azienda.*

stra sede centrale è in Svizzera. Lì abbiamo lo scartamento standard europeo, ma anche quello metrico. In Spagna, oltre allo scartamento standard europeo per i treni ad alta velocità, disponiamo anche di uno scartamento più largo e di uno metrico. Le nostre macchine sono altamente adattabili. Disponiamo di modelli per scartamento metrico. **E disponiamo anche di macchine con scartamento variabile, ad esempio per la Spagna, dove è possibile passare dallo scartamento standard a uno più largo.**

? Con quale frequenza modificate i parametri di progettazione fondamentali? **L'approvvigionamento energetico, ad esempio, è un problema importante.** I motori diesel non sono più così popolari, motivo per cui potrebbero essere utilizzati carburanti alternativi come l'HVO (oli vegetali idrogenati o idrotrattati). La Svizzera è particolarmente interessata ai filtri antiparticolato. Oppure le batterie sarebbero un'opzione praticabile? Dove state andando?

Crediamo che il motore diesel possa avere una seconda vita. Prima di passare a una soluzione elettrica molto costosa e non necessariamente più ecologica, con linee di contatto e propulsione ibrida come i nostri concorrenti, dobbiamo assicurarci che le configurazioni diesel siano il più possibile ottimizzate. Con le nostre macchine NEO Active (= New Energy Optimisation) – B 66 UC e la UC-D NEO Active – siamo riusciti a utilizzare i motori diesel in modo intelligente, suddividendo un tradizionale e grande motore diesel in due unità più piccole. In questo modo, invece di utilizzare costantemente un'unica enorme macchina inquinante, utilizziamo uno dei due generatori diesel solo quando è necessario. Questo rappresenta già una significativa riduzione sia in termini di progettazione che di impatto ambientale. Stiamo inoltre ottimizzando tutti i sistemi idraulici

per ridurre ulteriormente l'inquinamento. Questo ci consente di ridurre questi due indicatori di prestazione, in particolare le emissioni di CO₂, del 30% rispetto al modello precedente. **Consideriamo l'HVO una soluzione intelligente. È più costoso, ma disponibile ovunque. AdBlue® e filtri antiparticolato sono già di serie sulle nostre macchine. Dobbiamo muoverci in questa direzione.** Esistono modi per ridurre le emissioni di CO₂ nei motori diesel. Un giorno, probabilmente integreremo le batterie, una volta che saranno sufficientemente compatte e potenti. Credo che questo significhi una seconda e una terza vita per i motori diesel. I nostri valori sono dinamismo, affidabilità e ingegnoseria pragmatica. Pragmatismo e ingegnoseria sono importanti. Dobbiamo trovare soluzioni valide e affidabili per macchine di lunga durata. E siamo dinamici perché rispondiamo rapidamente e con competenza alle richieste dei nostri clienti.

“L'ITALIA È IL NOSTRO MERCATO PRINCIPALE!”

Attualmente in Italia sono in funzione oltre 250 macchine. Quasi tutti i treni di rinnovamento dei binari in Italia sono prodotti da MATISA. Il nostro personale locale mi ha raccontato che esiste perfino un nuovo verbo in italiano: “MATISAre”. Ovviamente, si tratta di una parola inventata. Indipendentemente dal produttore di una macchina, “MATISAre” è ora sinonimo di lavori sui binari!

? Congratulazioni! È probabilmente il più grande successo di marketing per un'azienda: quando il suo marchio o il suo nome aziendale diventano sinonimo di tutti i prodotti comparabili in un determinato settore. Grazie per l'intervista dettagliata!

L'intervista è stata condotta da Hermann Schmidtendorf.

January 19 and 20, 2026, in Berlin:

INTERNATIONAL CONFERENCE FOR RENEWABLE MOBILITY

In March 2022, the German rail freight company DB Cargo surprised the public with the news: its **diesel and shunting locomotives will soon run on a climate-neutral, zero-CO₂ fuel**. Extensive tests have shown that DB Cargo's diesel locomotive fleet can operate without any performance limitations using so-called **HVO fuel**. These bio fuels make consistently climate-neutral supply chains possible for DB Cargo customers.

Battery and hydrogen propulsion are important innovations for the mobility industry. But they cannot be implemented overnight and cannot be implemented everywhere. Therefore, sustainable bio fuels such as bio diesel, bio ethanol, and bio methane, as well as other innovative renewable fuels, are the backbone of greenhouse gas reduction in the mobility sector. They offer practical solutions for road, heavy-duty and freight transport, aviation, shipping, agriculture and forestry, as well as municipal public transport.

Information on this topic will be available on January 19 and 20, 2026, at the 23rd International Conference on Renewable Mobility "Fuels of the Future 2026" at the CityCube Berlin. Over the past 22 years, the International Conference has established itself as the leading event for the European biofuels industry and as an important discussion forum for the development of renewable mobility. Organisers expect around 700 participants from over 30 nations in 2026. Technological open-

ness remains a key strategy. With over 70 expert presentations on current industry developments, political and legal frameworks, innovations, and international market potential, the conference once again offers ideal opportunities for exchange and networking. The event will, as usual, be held bilingually (German/English).

The diversity of renewable fuels is essential for achieving immediate, effective climate protection. The right political framework is crucial for significantly accelerating market ramp-up. An important lever in Germany is the current draft law for the further development of the greenhouse gas reduction quota (GHG quota). The planned measures to combat fraud and the expansion to air and shipping are steps in the right direction. Furthermore, the 5.8% limit for bio fuels from cultivated bio mass permitted by European Union law should be fully utilised to safeguard existing climate protection performance. A comprehensive fuel strategy for the entire transport sector is called for. Such a concept must provide for increasing shares of renewable fuels, for example, through the approval of E20 while phasing out E5 as a protected fuel variety, or through targeted support for bio diesel in the form of B20/B30 and B100, say the conference organisers.

Hermann Schmidtendorf

Agricultural machinery can also be powered by biofuel.

Anche i macchinari agricoli possono essere alimentati a biocarburante.



Credits: New Holland

ABSTRACTS

19 e 20 gennaio 2026, a Berlino:

CONFERENZA INTERNAZIONALE SULLA MOBILITÀ RINNOVABILE

A marzo 2022, la compagnia ferroviaria tedesca DB Cargo ha sorpreso il pubblico con una

notizia: le sue **locomotive diesel e di manovra saranno presto alimentate con un carburante a impatto climatico zero e a zero emissioni di CO₂**. Test approfonditi hanno dimostrato che la flotta di locomotive diesel di DB Cargo può funzionare senza limitazioni di prestazioni utilizzando il cosiddetto **carburante HVO**. Questi biocarburanti rendono possibili catene di approvvigionamento costantemente a impatto climatico zero per i clienti di DB Cargo.

La propulsione a batteria e a idrogeno sono innovazioni importanti per il settore della mobilità. Tuttavia, non possono essere implementate dall'oggi al domani e non possono essere implementate ovunque. Pertanto, i biocarburanti sostenibili come biodiesel, bioetanolo e biometano, così come altri carburanti rinnovabili innovativi, rappresentano la spina dorsale della riduzione dei gas serra nel settore della mobilità. Offrono soluzioni pratiche per il trasporto su strada, pesante e merci, l'aviazione, la navigazione, l'agricoltura e la silvicoltura, nonché il trasporto pubblico comunale.

Informazioni su questo argomento saranno disponibili il 19 e 20 gennaio 2026 in occasione della 23a Conferenza Internazionale sulla Mobilità Rinnovabile "Fuels of the Future 2026" presso il CityCube di Berlino. Negli ultimi 22 anni, la Conferenza Internazionale si è affermata come evento leader per l'industria europea dei biocarburanti e come importante forum di discussione per lo sviluppo della mobilità rinnovabile. Gli organizzatori prevedono circa 700 partecipanti da oltre 30 nazioni nel 2026. L'apertura tecnologica rimane una strategia chiave. Con oltre 70 presentazioni di esperti sugli attuali sviluppi del settore, sui quadri politici e giuridici, sulle innovazioni e sul potenziale del mercato internazionale, la conferenza offre ancora una volta opportunità ideali di scambio e networking. L'evento si terrà, come di consueto, in lingua bilingue (tedesco/inglese).

La diversità dei combustibili rinnovabili è essenziale per raggiungere una protezione climatica immediata ed efficace. Il giusto quadro politico è fondamentale per accelerare significativamente la crescita del mercato. Una leva importante in Germania è l'attuale progetto di legge per l'ulteriore sviluppo della quota di riduzione dei gas serra (quota GHG). Le misure previste per contrastare le frodi e l'espansione al trasporto aereo e marittimo rappresentano passi nella giusta direzione. Inoltre, il limite del 5,8% per i biocarburanti da biomassa coltivata, consentito dalla legislazione dell'Unione Europea, dovrebbe essere pienamente sfruttato per salvaguardare le attuali prestazioni in materia di protezione del clima.

È necessaria una strategia globale sui carburanti per l'intero settore dei trasporti. Tale strategia deve prevedere quote crescenti di carburanti rinnovabili, ad esempio attraverso l'approvazione dell'E20 e la graduale eliminazione dell'E5 come varietà di carburante protetta, o attraverso un sostegno mirato al biodiesel sotto forma di B20/B30 e B100, affermano gli organizzatori della conferenza.

Hermann Schmidtendorf

Jörg Schneider, project manager for alternative fuels at DB Cargo, is pleased: diesel fuel on the right burns with heavy smoke, but the bio fuel HVO on the left burns with almost no emissions.

Jörg Schneider, responsabile del progetto per i carburanti alternativi presso DB Cargo, è soddisfatto: il gasolio sulla destra brucia producendo fumo denso, mentre il biocarburante HVO sulla sinistra brucia praticamente senza emissioni.

**23rd International Conference
on Renewable Mobility**
TIME TO TURBOCHARGE, REVVING UP FOR RENEWABLES
19. – 20. January 2026 | CityCube Berlin



Credits: Deutsche Bahn AG / Oliver Lang



PJM Group: “Italy and Switzerland are leading the way in digital solutions for freight wagons”

The PJM Group was founded in Graz, Austria, in 2006. It includes PJ Mess-technik, PJ Monitoring, and PJ Motion. In cooperation with Railway Competence and Certification GmbH (RCC), comprehensive solutions, including approval, can be implemented for customers. With perseverance and determination, over 80 people at PJM work to create excellent, innovative products “Made in Austria.” This has resulted in repeated awards. CEO Günter Petschnig (right in the picture) and COO Christoph Lorenzutti (left) received the Austrian State Prize for Digitalisation 2023 and the VCÖ Mobility Award 2023 for their developments. Mercitalia Intermodal’s pilot train (“Smart Train”), equipped with complete PJM solutions, also received the “Il Logistico dell’Anno 2023” award from Assologistica. Our editorial team spoke with CEO Günter Petschnig at the transport & logistic trade fair.



Credits: Hermann Schmidendorf

? **CARGO FREIGHT JOURNAL/rail & mobility:**
What direction are developments currently heading?

Günter Petschnig: Our customers’ main focus is increasingly on the automation of time-consuming processes such as brake train preparation. Customers, especially in countries with high labour costs, are finding it difficult to attract staff. Therefore, we are very focused on Switzerland, Italy, Germany, and Austria. It is, of course, a difficult market environment. But we are generally optimistic about the future. This is especially true for

SBB, which will be the first in Europe to integrate its fleet with automatic train preparation. And for Italy, where our complete solutions are being implemented in freight trains.

? Do you have other important customers on board?

Interest in our system is also increasing at Deutsche Bahn. We work closely with ÖBB (Austrian Federal Railways). The leading Slovak freight car manufacturer Tatravagónka is now integrating PJM’s digital freight train functions and automated applications ►

into its range of equipment. We generally have a good reputation, and we are satisfied with that. We also believe that **we can position ourselves very well in the field of Digital Automatic Coupling (DAC) and the trends that will emerge in the coming years. With our system, we can serve both worlds – the screw coupling world and the DAC world in one system, providing the same customer benefits and the same train driver experience.** It’s also important that we now focus more specifically with our customers on the development of reporting non-safety-relevant information, such as brake monitoring, directly to the train driver. Our IDDS derailment detection system, whose development is now being finalised, is also generating increasing interest. We simply want to build a complete system for freight cars – from brake testing to safety monitoring, all the way to damage prevention. And we’re well on track in this regard.

? What direction is your work on derailment diagnostics taking?

On the one hand, we want to detect derailments at high speed, where, for example, individual bogies jump off the track. But derailments at slow speeds should also be detected, if an entire railcar actually falls off the track. The impetus for our work in this area was a serious derailment accident in 2009 in Viareggio, Italy. At the time, the wagons belonged to a private rental company and were used by foreign companies. But the Italian state railway doesn’t want to experience something similar with its own wagons. Therefore, it is now finalising its own wagons in this area so that it can then equip additional vehicles with a derailment system. And this system can also be expanded, allowing even higher-quality sensors to be used. Of course, you have to strike a balance between the costs and the expected results. That is, what percentage of derailments can be reliably detected with this system?

? Any progress is welcome, isn’t it? In the **derailment in the Swiss Gotthard Tunnel**, the repair work took months and cost 130 million Swiss francs (140 million euros), with half of the costs arising from damage outside the tunnel?

These are, of course, the use cases. Ideally, a derailment can be detected so quickly that the train driver notices it within a second and can then stop the train. Of course, it’s bad, like what happened in Switzerland on a tunnel line, where kilometres of track are destroyed. And it’s even more catastrophic if a train derails and then a serious accident occurs at a switch with oncoming traffic. That would be quite dramatic. Derailment detection isn’t easy; it’s technically challenging. But we have a really good solution.

? Your portfolio also includes the use of measuring wheelsets. When are such wheels needed?

As part of vehicle approvals for new vehicles, test runs with measuring wheelsets are required. We have a solution for that. We’ve been working on this topic for ten years and have a good product on the market. And the testing centre that cooperates with us uses our measuring wheelsets to carry out such approvals. We’ve even taken them to America, for example. There, we have our own dynamic calibration test benches. This makes us quite unique.

We use original wheel sets from the tested vehicles. We calculate: Where should the sensors be mounted? We apply these sensors to measure the vertical and lateral forces. Then they are mounted on our test bench. There, they are subjected to loads in all directions. This creates a map from which the values can be read during the measurement campaign. Where is the wheelset now, and what forces are acting at the moment?

Our advantage is that we use genuine wheelsets that function in their original condition. We use the wheelsets as they are. We have a very high level of measurement accuracy. This is a very important issue, even under high dynamic loads. Other systems weaken the wheelset. Then you have to prove that the measurement results are still valid. We don’t have to provide such evidence. We can offer testing and approval procedures as a complete package.

! Mr. Petschnig, thank you very much for this information!

The Interview was conducted by Hermann Schmidendorf.

ABSTRACTS

PJM Group:
ITALIA E SVIZZERA SONO ALL'AVANGUARDIA NELLE SOLUZIONI DIGITALI PER I CARRI MERCI

Il Gruppo PJM è stato fondato a Graz, in Austria, nel 2006. Comprende PJ Messtechnik, PJ Monitoring e PJ Motion. In collaborazione con Railway Competence and Certification GmbH (RCC), è possibile implementare per i clienti soluzioni complete, inclusa l'omologazione. Con perseveranza e determinazione, oltre 80 persone in PJM lavorano per creare prodotti eccellenti e innovativi "Made in Austria".

Questo ha portato a ripetuti riconoscimenti. Il CEO Günter Petschnig (a destra nella foto) e il COO Christoph Lorenzutti (a sinistra) hanno ricevuto il Premio di Stato austriaco per la Digitalizzazione 2023 e il VCÖ Mobility Award 2023 per i loro sviluppi. Il treno pilota di Mercitalia Intermodal ("Smart Train"), equipaggiato con soluzioni PJM complete, ha ricevuto anche il premio "Il Logistico dell'Anno 2023" di Assologistica. La nostra redazione ha intervistato il CEO Günter Petschnig alla fiera dedicata al trasporto e alla logistica.

L'attenzione principale dei nostri clienti è sempre più rivolta all'automazione di processi che richiedono molto tempo, come la preparazione dei treni freno. I clienti, soprattutto nei paesi con elevati costi del lavoro, hanno difficoltà ad attrarre personale. Pertanto, ci concentriamo molto su Svizzera, Italia, Germania e Austria. Si tratta, naturalmente, di un contesto di mercato difficile. Ma siamo generalmente ottimisti per il futuro. Questo vale soprattutto per le FFS, che saranno le prime in Europa a integrare la propria flotta con la preparazione automatica dei treni. E per l'Italia, dove le nostre soluzioni complete vengono implementate sui treni merci.

Anche presso Deutsche Bahn l'interesse per il nostro sistema sta crescendo. Collaboriamo a stretto contatto con le ÖBB (Ferrovie Federali Austriache). Il principale produttore slovacco di carri merci, Tatravagónka, sta ora integrando le funzioni digitali per treni merci e le applicazioni automatizzate di PJM nella sua gamma di apparecchiature. Crediamo inoltre di poterci posizionare molto bene nel campo dell'accoppiamento automatico digitale (DAC) e nelle tendenze che emergeranno nei prossimi anni. Con il nostro sistema, possiamo servire entrambi i mondi: il mondo dell'accoppiamento a vite e il mondo del DAC in un unico sistema, offrendo gli stessi vantaggi al cliente e la stessa esperienza al macchinista.

È inoltre importante che ora ci concentriamo più specificamente, insieme ai nostri clienti, sullo sviluppo della segnalazione di informazioni non rilevanti per la sicurezza, come il monitoraggio dei freni, direttamente al macchinista. Anche il nostro sistema di rilevamento dei deragliamenti IDDS sta suscitando crescente interesse. Vogliamo semplicemente realizzare un sistema completo per i carri merci, dalla prova dei freni al monitoraggio della sicurezza, fino alla prevenzione dei danni.

DIAGNOSTICA DEI DERAGLIAMENTI: Da un lato, vogliamo rilevare i deragliamenti ad alta velocità, dove, ad esempio, singoli carrelli escono dai binari. Ma anche i deragliamenti a bassa velocità dovrebbero essere rilevati, ad ►



An FS Logistix wagon with digital equipment from PJM.
Un carro FS Logistix con strumentazione digitale PJM.

esempio quando un intero vagone esce dai binari. L'impulso per il nostro lavoro in questo settore è stato un grave incidente di deragliamento nel 2009 a Viareggio, Italia. All'epoca, i vagoni appartenevano a una società di noleggio privata e venivano utilizzati da aziende straniere. Ma le Ferrovie dello Stato italiane non vogliono sperimentare un'esperienza simile con i propri vagoni. Pertanto, stanno ora ultimando i propri vagoni in questo settore, in modo da poter poi dotare altri veicoli di un sistema di deragliamento. Questo sistema può anche essere ampliato, consentendo l'utilizzo di sensori di qualità ancora superiore. Naturalmente, è necessario trovare un equilibrio tra costi e risultati attesi. Cioè, quale percentuale di deragliamenti può essere rilevata in modo affidabile con questo sistema?

Idealmente, un deragliamento può essere rilevato così rapidamente che il macchinista se ne accorge entro un secondo e può quindi fermare il treno. Certo, è un problema grave, come quello che è successo in Svizzera su una linea in galleria, dove chilometri di binari vengono distrutti. Ed è ancora più catastrofico se un treno deraglia e poi si verifica un grave incidente a uno scambio con il traffico in arrivo. Sarebbe davvero drammatico. Rilevare un deragliamento non è facile; è tecnicamente impegnativo. Ma abbiamo un'ottima soluzione.

SALE MONTATE DI MISURA:

Nell'ambito delle omologazioni dei veicoli nuovi, sono richieste prove con sale montate di misura. Abbiamo una soluzione per questo. Lavoriamo su questo argomento da dieci anni e abbiamo un buon prodotto sul mercato. E il centro di collaudo che collabora con noi utilizza le nostre sale montate di misura per eseguire tali omologazioni. Le abbiamo persino portate in America, ad esempio. Lì, disponiamo dei nostri banchi di prova per la calibrazione dinamica. Questo ci rende unici. Utilizziamo sale montate originali dei veicoli testati. Calcoliamo: dove dovrebbero essere montati i sensori? Utilizziamo questi sensori per misurare le forze verticali e laterali. Poi li montiamo sul nostro banco di prova. Lì, vengono sottoposti a carichi in tutte le direzioni. Questo crea una mappa da cui è possibile leggere i valori durante la campagna di misura.

Il nostro vantaggio è che utilizziamo sale montate originali che funzionano nelle loro condizioni originali. Abbiamo un livello di precisione di misurazione molto elevato. Questo è un aspetto molto importante, anche in presenza di carichi dinamici elevati. Altri sistemi indeboliscono la sala montata. In questo caso, è necessario dimostrare che i risultati della misurazione siano ancora validi. Noi non siamo tenuti a fornire tali prove. Possiamo offrire procedure di collaudo e approvazione come pacchetto completo.

Hermann Schmidtendorf

A digital display shows the load weight at all times.
Un display digitale mostra il peso del carico in ogni momento.



The special feature is inside: a measuring wheelset from PJM.
La particolarità all'interno: un set di ruote di misurazione PJM.





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Greetings

DEAR READERS AND FORUM PARTICIPANTS!

Collegio Ingegneri Ferroviari Italiani (CIFI) is one of the oldest technical associations in Italy, founded in 1899. It has over 2,200 members, including 180 companies and institutions, operating in the transportation sector. Its main task is to maintain and disseminate railway culture.

Its activities include conferences, technical visits, events, and the publication of magazines (Ingegneria Ferroviaria and La Tecnica Professionale) and books.

Through its company CIFI Servizi, it organises training courses and consulting services on transport.

CIFI welcomes you to the Naples Forum, organ-

ised together with the umbrella association UEEIV to enrich your knowledge and exchange information.

The Forum is an opportunity for in-depth technical discussions and the presentation of European innovations related to slab track, and is a way for experts to exchange ideas.

The CIFI wishes you a pleasant stay in Naples, a chance to discover the historic site of Pietrarsa with its railway museum, and an interesting series of conferences, meetings, and debates.

Valerio Giovine – General Secretary CIFI – Italian College of Railway Engineers • <https://www.cifi>



CIFI also publishes professional publications. CIFI pubblica anche pubblicazioni professionali.

Saluti

CARI LETTORI E PARTECIPANTI AL FORUM,

Il Collegio Ingegneri Ferroviari Italiani (CIFI) è una delle più antiche Associazioni tecniche italiane, costituita nel 1899. Ha oltre 2200 Soci, di cui 180 Aziende e Istituzioni, operanti nel settore del trasporto e ha lo scopo di mantenere e diffondere la cultura ferroviaria.

Le sue attività comprendono convegni, visite tecniche, eventi e la pubblicazione di Riviste (Ingegneria Ferroviaria e La Tecnica Professionale) e di libri.

Attraverso la sua società CIFI Servizi organizza corsi di formazione e attività di consulenza nell'ambito dei trasporti.

Il CIFI vi dà il benvenuto al Forum di Napoli, organizzato insieme alla Associazione "ombrello" UEEIV per arricchire le vostre conoscenze e scambiare informazioni.

Il Forum è un'occasione di approfondimento tecnico e di presentazione di novità a livello europeo relative al binario su piastra ed è un modo per confrontarsi tra esperti.

Il CIFI vi augura un piacevole soggiorno a Napoli, la scoperta del sito storico di Pietrarsa con il suo museo ferroviario e una interessante serie di conferenze, incontri e dibattiti.



Valerio Giovine – Segretario Generale CIFI

Exhibitors & Sponsors





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INFO

FOUNDED IN 1899

The College of Italian Railway Engineers (CIFI), founded in 1899, is one of the oldest and most important technical and professional

associations in Italy.

Main objectives:

- promote the study of scientific, technical, economic, and legislative issues relating to railways and transportation, engaging with the public and relevant institutions
- enhance the role of engineers and transportation experts by contributing to their cultural and professional growth
- contribute to the improvement of technical and professional culture through the organization of training courses. **The College brings together over 2,400 individual members involved in railways and transportation and over 150 collective members, including industrial and transportation companies and universities.** In the publishing field, CIFI publishes two periodicals:
 - “**Ingegneria Ferroviaria**”, a monthly magazine on transport technology and economics
 - “**La Tecnica Professionale**”, a monthly collection of studies and news for railway education
- **Organisation of conferences and conventions** on scientific, technical, and economic topics of interest or current affairs. Planning and organising training and professional development courses, as well as educational trips. Awarding of scholarships, including through contributions from individual and collective members, and prizes for articles published in journals, to encourage study and research on land transport.
- **Management of the association’s library**, with over 7,100 works and journals, primarily on railways, published from the late 19th century to the present, available free of charge to scholars and enthusiasts. Publication of railway or transport-related books of scientific, technical, and professional interest.



Programme

Thursday, 6 November

Main Conference

Venue: Pietrarsa Railway Museum

10:00 – 11:15 FIRST SESSION: SLAB TRACK SYSTEMS

Moderator: Dipl.-Ing. Dr. EURAIL-Ing Bernhard Knoll, UEEIV Vice President

10:00 – 10:20 **Highly Versatile and Proven Slab Track Technology for a Range of Demanding Railway Applications**
Dipl. Ing. Vlad Metaxa, Slab Track Engineering, PORR Bau GmbH (Austria)
Ing. Rudolf Felsner, Major Projects Engineering Director, VCE (Austria)

10:20 – 10:40 **Fast System – Innovation in ballastless tracks**
Giulia Maria Besemer
Salcef Group (Italy)

10:40 – 11:00 **Slab track as a response to the modern demand for a sustainable rail system**
Tatjana Simić, dipl.eng.civil, Managing Director, TAK&TRACK BEOGRAD, (Serbia)
Prof.dr. Stanko Brčić, dipl.eng.civil, Faculty of Civil Engineering, Belgrade (Serbia)

11:00 – 11:15 **Q&A Session**

11:15 – 11:45 COFFEE BREAK & NETWORKING

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11:45 – 13:00 SECOND SESSION: SLAB TRACK SYSTEMS

Moderators: Dipl.-Ing. Dr. EURAIL-Ing Bernhard Knoll, UEEIV Vice President

11:45 – 12:05 **Arianna® Slab Track: Meeting Modern Challenges in Sustainable Rail Infrastructure for Future Generations – The Storstrøm Bridge Case**
M.Sc. Eng. Michele Gavazzeni
Product Manager, Weigh (Italy)

12:05 – 12:25 **Low Vibration Track (LVT) – The efficient slab track system for highest requirements**
Thomas Dorfner, B.Sc. (Chem.), MBA
Head of International Sales, Sonneville AG (Switzerland)

12:25 – 12:45 **FCA common interface - Futureproofing against changes in noise and vibration**
Mr Steven Curphey BEng MSc, Market Manager
Pandrol (UK)

12:45 – 13:00 **Q&A Session**

13:00 – 14:00 LUNCH BREAK & NETWORKING

14:00 - 15:15 THIRD SESSION: SLAB TRACK SYSTEMS

Moderators: Dipl. Ing. Marco Corradini

14:00 – 14:20 **Innovation & International Experiences with Construction & Renewal of Slab Track**
Dipl.-Ing. Stefan Vonbun
Head of Superstructure Product, Rhomberg Sersa Bahntechnik GmbH (Austria)

14:20 – 14:40 **Slab Track Applications in National and International Railway Projects: Italferr's Design Experience**
Damiano Fulgione
Technical Direction, Italferr (Italy)

14:40 – 15:00 **Ballastless Track Solutions for new and to be renewed railways tracks**
Dipl.-Ing. Jens Kleeberg
Chief Sales Officer, RAILONE (Germany)

15:00 – 15:15 **Q&A Session**

15:15 – 15:45 COFFEE BREAK & NETWORKING

15:45 - 17:00 FOURTH SESSION: DIGITALIZATION IN RAILWAY TRACK

Moderator: Dott. Ing. Marco Broglia, UEEIV Vice President

15:45 – 16:05 **Risk-based approach in design of slab track for vibration mitigation**
Dipl.-Ing. Marco Acquati
Vibroacoustic Project Coordinator, MM Spa (Italy)

16:05 – 16:25 **The 360° no contact survey for railway and underground environment**
Eng. Giuseppe Bomben
Sales Manager, Automotive Diagnostic Solutions S.R.L. (Italy)

16:25 – 16:45 **Digital Transformation of Railway Infrastructure - TMC**
Stefan Damm, CEO DMA Torino (Italy),
Dipl.-Ing. Jochen Nowotny, MBA, CEO tmc Track Machines Connected (Austria)

16:45 – 17:05 **Rail Management Solutions for Slab Track applications and beyond**
Dr. Richard Stock
Global Head of Rail Solutions, Plasser & Theurer / Plasser American (USA)

17:05 – 17:20 **Q&A Session**

20:00 NETWORKING DINNER: Fresco Trattoria Pizzeria

Via Partenope, 8, 80121 Napoli



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Friday, 7 November

09:00 – 10:40 FIFTH SESSION: SLAB TRACK PROJECTS

Moderator: Dipl. Ing. Daniel Wirth, UEEIV Secretary

09:00 – 09:20 Construction lots for railway equipment at the Brenner Base Tunnel
Dott. Ing. Michele Ianeselli, Project Manager for railway equipment design
Dipl.-Ing. Dr Matthias Hofmann, Head of the Planning Department Austria
BBT SE (Austria)

09:20 – 09:40 Structural Analysis and Construction of a Cut-and-Cover Tunnel Slab Track: The GAZIRAY Experience
Assoc. Prof. Dr. Omur Akbayir
Editor, Turkish Railway Engineer's Association (Türkiye)

09:40 – 10:00 Modernization of the ÖBB Tauern Tunnel, partial renewal of the slab track
Prok. Dipl.-Ing. Thomas Lercher
Technical branch manager, Swietelsky AG (Austria)

10:00 – 10:20 Static and Dynamic Investigation of Mass Spring System in Chile
Dipl.-Ing. Dr.techn. Elisabetta Pistone
Project Manager, VCE Vienna Consulting Engineers GmbH (Austria)

10:20 – 10:40 Q&A Session

10:40 – 11:10 COFFEE BREAK & NETWORKING

11:10 – 12:50 SIXTH SESSION: SLAB TRACK PROJECTS

Moderator: Dr. Ing. Valerio Giovine, General Secretary of CIFI

11:10 – 11:30 Optimisation of transition zones can significantly increase the efficiency of railway lines
Mag.(FH) Harald Steger
Product Manager, Getzner Werkstoffe GmbH (Austria)

11:30 – 11:50 Barking Riverside Extension – Slab Track Viaduct with Precast S&C
Barnaby Temple, CEng, MICE
Chief Engineer, Rhomborg Sersa UK Ltd (United Kingdom)

11:50 – 12:10 Proven Preventive Measures for Resilient Slab Track Systems
M.Eng., Mehdi Maghfouri, PMP
Chief Technical Manager, Larsen & Toubro Railway Business Group (India)

12:10 – 12:30 Environmental Emissions Analysis of Slab Track System using Life Cycle Assessment
Marinella Giunta, Associate Professor
Università degli studi Mediterranea di Reggio Calabria (Italy)

12:30 – 12:50 Q&A Session

12:50 – 13:50 LUNCH BREAK & NETWORKING

13:50 – 16:50 SEVENTH SESSION: SLAB TRACKS ON PUBLIC TRANSPORT SYSTEMS

Moderator: Dipl. Ing. Olaf Scholtz-Knobloch, UEEIV President

13:50 – 14:10 Polymer-Based Slab Track: Finite Element Analysis Towards a Circular Economy
Railway Infrastructure
Ing. Lasse Hansen, MBE
Doctoral researcher, Technical University Berlin (Germany)

14:10 – 14:30 Prefab embedded rail fastening (ERS-M), comprising conditioned state-of-the-art track fastening with minimal installation time in tramway systems
Rik Monteban, MBA, Regional Director North-West Europa, MEA & India
edilon)(sedra b.v. (Netherlands)

14:30 – 14:50 Solutions for Tram Slab Track structures – TINES TRAM integrated tram - road surface system
Tomasz Szuba, CEO, TINES Rail SA
Assoc. Prof. Michał Strach, D.Sc., Professor at AGH University of Krakow

14:50 – 15:10 Zagreb 21-STT Innovative Track Fastening System in Urban Tramway Construction
univ.mag.ing.aedif. Franka Meštrović
Research and Teaching Assistant, University of Zagreb (Croatia)

15:10 – 15:25 Q&A Session

15:25 – 16:00 PODIUM DISCUSSION

Moderators: Dipl. Ing. Olaf Scholtz-Knobloch, UEEIV President
Dipl.-Ing. Dr. EURAIL-Ing Bernhard Knoll, UEEIV Vice President

Panel:

Stefan Damm, CEO DMA Torino (Italy)
Dipl.-Ing. Stefan Vonbun, Head of Superstructure Product, Rhomborg Sersa Bahntechnik GmbH (Austria)
Marinella Giunta, Associate Professor, Università degli studi Mediterranea di Reggio Calabria (Italy)

16:00 – 16:20 Farewell and Thanksgiving

16:20 - 18:00 VISIT OF THE MUSEUM

Saturday, 8 November

09:30 – 13:00 Excursion to the Naples: Visit famous metro stations on line 1 and the new line 6

Meeting point: outside the Centro Direzionale station (Line 1)
Visit to the stations: Centro Direzionale, Toledo/Montecalvario, Chiaia, and San Pasquale

UEEIV – CIFI RAILWAY FORUM NAPOLI

“Gather a deeper insight into the entire railway systems technology!”

How does the UEEIV Chairman remember the last UEEIV Railway Forum 2024 in Sofia? What does he expect from the forum in Naples? We asked Olaf Scholtz-Knobloch for a statement.

Credits: Hermann Schmidtendorf



Olaf Scholtz-Knobloch (centre) with members of the organising committee in Sofia.

Olaf Scholtz-Knobloch (al centro) con i membri del comitato organizzatore a Sofia.

The presentations in Sofia were very well received overall. I received good feedback. We were able to visit a new railway line, where we saw a tunnel being built. It made a very professional impression. Overall, we were very happy. The evening event was also very nice. Our hosts in Sofia had chosen a very nice restaurant with authentic, local cuisine. One thing I learned: If anyone knows how to party really well, it's the Bulgarians! It was a really nice party with music, shows, and dancing. I also really liked the mixed audience. You could really see young and old people dancing happily together. There was even a ring dance in between – everyone joined in. The social program was also very enjoyable.

Before the conference, several people approached me and asked: Tell me, the main topic of TSI is quite

specialised. I work more across disciplines. Others said I only work in the field of track construction. But you also want to talk about other disciplines like signaling or rolling stock. Can I even follow that? Is that interesting for me too?

At the end of the conference in Sofia, we spoke with these people again. They said: Wow, I found that really interesting. The speakers always gave examples in their technical presentations. The first presentation was

an exception. Those who weren't that deeply familiar with the topic learned in general terms what TSI is, how the system works, how it came about, and what the various intermediate steps were. The subsequent presentations essentially focused on individual technical topics.

And the people really enjoyed that because they realised: Oh! I know about another discipline, but this discipline has similar problems, just a little different. Through this overview of the entire railway system technology, the participants gained a different, deeper insight. I was pleased that people appreciated this. I really enjoyed it.

I hope and expect similar results from this new conference in beautiful Naples!

Dipl.-Ing. Olaf Scholtz-Knobloch

UEEIV – CIFI RAILWAY FORUM NAPOLI

“Una approfondimento più approfondente sull'intera tecnologia dei sistemi ferroviari!”

Come ricorda il Presidente dell'UEEIV l'ultimo Forum Ferroviario UEEIV 2024 a Sofia? Cosa si aspetta dal forum di Napoli? Abbiamo chiesto a Olaf Scholtz-Knobloch di rilasciare una dichiarazione.

Le presentazioni a Sofia sono state complessivamente molto apprezzate. Ho ricevuto un feedback positivo. Abbiamo potuto visitare una nuova linea, dove abbiamo visto la costruzione di un tunnel. L'impressione è stata molto professionale. Nel complesso, siamo stati molto soddisfatti. Anche l'evento serale è stato molto piacevole. I nostri ospiti a Sofia avevano scelto un ristorante molto carino con cucina locale autentica. Una cosa che ho imparato: se c'è qualcuno che sa come divertirsi davvero, sono i bulgari! È stata una festa davvero bella con musica, spettacoli e balli. Mi è piaciuto molto anche il pubblico eterogeneo. Si vedevano davvero giovani e anziani ballare allegramente insieme. C'è stato persino un ballo in cerchio tra un evento e l'altro, a cui tutti hanno partecipato. Anche il programma sociale è stato molto piacevole.

Prima della conferenza, diverse persone mi hanno contattato e mi hanno chiesto: “Dimmi, l'argomento principale della TSI è piuttosto specialistico. Io lavoro più in modo interdisciplinare”. Altri hanno detto che lavoro solo nel campo della costruzione di binari. Ma vuoi parlare anche di altre discipline come la segnalazione o il materiale rotabile? Posso seguirlo? È interessante anche per me?”.

Alla fine della conferenza a Sofia, abbiamo parlato di nuovo con queste persone. Mi hanno detto: “Wow, l'ho trovato davvero interessante”. I relatori hanno sempre fatto degli esempi nelle

loro presentazioni tecniche. La prima presentazione è stata un'eccezione. Chi non aveva una conoscenza approfondita dell'argomento ha imparato in termini generali cos'è la TSI, come funziona il sistema, come è nato e quali sono stati i vari passaggi intermedi. Le presentazioni successive si sono concentrate essenzialmente su singoli argomenti tecnici.

E i partecipanti hanno apprezzato molto questo aspetto perché si sono resi conto: “Oh! Conosco un'altra disciplina, ma questa disciplina ha problemi simili, solo un po' diversi”. Attraverso questa panoramica dell'intera tecnologia del sistema ferroviario, i partecipanti hanno acquisito una visione diversa e più approfondita. Sono stato contento che i partecipanti l'abbiano apprezzato. Mi è piaciuto molto.

Spero e mi aspetto risultati simili da questa nuova conferenza nella splendida Napoli.

Ingegnere Olaf Scholtz-Knobloch



The forum's venue in Naples: the National Pietrarsa Railway Museum.

La sede del forum a Napoli è il Museo Nazionale Ferroviario di Pietrarsa.

Credits: Fondazione FS

UEEIV member association VDEI • Associazione membro UEEIV VDEI

VDEI RAILWAY DAYS NOVEMBER 25–26, 2025 IN RADEBEUL

In June 2024, the UEEIV member association VDEI organised a two-day specialist conference in Chemnitz called “Railway Days.” The venue was the Saxon Railway Museum in Hilbersdorf – a great idea. This meant that the approximately 200 participants were always aware of the tradition and history of the railways during the debates.

At the beginning of the conference, VDEI President Prof. Dr. Birgit Milius emphasised the importance of thinking beyond the boundaries of one’s own field. Many things in the German railway sector are not running satisfactorily. In order to develop solutions to the problems, more collaboration between the individual specialist areas is necessary. Even proven experts should continue their interdisciplinary training. Furthermore, problems in the railway industry need to be better explained. The complexity and diversity of the issues are often not apparent to all involved or to society.

Speakers from politics, the railway industry, and business provided a holistic perspective. The conference participants included the mayor of Chemnitz, representatives of Deutsche Bahn, the passenger association PRO BAHN, the railway union EVG, and the Federal Association of Medium-Sized Construction Companies. This was followed by debates in several workshops organised by the VDEI expert committees. Topics included rapid construction, generalisation, digitalisation for planning, design, and construction,



Dr. Jürgen Murach

and the superstructure of railway lines.

This year’s “VDEI Railway Days” on November 25 and 26 aim to build on the great success of this event. The focus of the discussions and presentations will be on railway infrastructure. Key questions addressed include: What are the framework conditions? How does interdisciplinary transport route planning work? How do we achieve planning reliability? Radebeul is home to a famous narrow-gauge railway that still uses steam locomotives. This time, participants can once again delve deeply into the history between the lectures on modern railways. There’s even a special steam train ride the day before, November 24th.

So, it’s worth coming to Radebeul during these days for many reasons! Information and registration at: info@vdei-akademie.de

Dr. Jürgen Murach, Vice president VDEI

Credits (2): Hermann Schmidtendorf

UEEIV member association VDEI • Associazione membro UEEIV VDEI
GIORNATE FERROVIARIE VDEI 25-26 NOVEMBRE 2025 A RADEBEUL

Nel giugno 2024, l’associazione VDEI, membro dell’UEEIV, ha organizzato a Chemnitz un convegno specialistico di due giorni intitolato “Giornate Ferroviarie”. La sede dell’evento è stata il Museo Ferroviario Sassone di Hilbersdorf: un’idea geniale. In questo modo, i circa 200 partecipanti hanno potuto essere costantemente aggiornati sulla tradizione e la storia delle ferrovie durante i dibattiti.

All’inizio del convegno, la Presidente della VDEI, la Prof.ssa Dr.ssa Birgit Milius, ha sottolineato l’importanza di pensare oltre i confini del proprio settore. Molte cose nel settore ferroviario tedesco non funzionano in modo soddisfacente. Per sviluppare soluzioni ai problemi, è necessaria una maggiore collaborazione tra i singoli settori specialistici. An che gli esperti più affermati dovrebbero continuare la loro formazione interdisciplinare. Inoltre, i problemi del settore ferroviario devono essere spiegati meglio. La complessità e la diversità delle problematiche spesso non sono evidenti a tutti i soggetti coinvolti o alla società. Relatori provenienti dal mondo politico, ferroviario e imprenditoriale hanno offerto una prospettiva olistica.

Tra i partecipanti alla conferenza figuravano il sindaco di Chemnitz, rappresentanti della Deutsche Bahn, dell’associazione passeggeri PRO BAHN, del sindacato ferroviario EVG e dell’Associazione Federale delle Medie Imprese Edili. A seguire, si sono svolti dibattiti in diversi workshop organizzati dai comitati di esperti del VDEI (Ferrovie Tedesche). Tra i

temi trattati figuravano la costruzione rapida, la generalizzazione, la digitalizzazione per la pianificazione, la progettazione e la costruzione e la sovrastruttura delle linee ferroviarie.

Le “Giornate Ferroviarie VDEI” di quest’anno, il 25 e 26 novembre, si propongono di consolidare il grande successo di questo evento. Il focus dei dibattiti e delle presentazioni sarà l’infrastruttura ferroviaria. Tra le domande chiave affrontate figurano: quali sono le condizioni quadro? Come funziona la pianificazione interdisciplinare dei percorsi di trasporto? Come si ottiene l’affidabilità della pianificazione? Radebeul ospita una famosa ferrovia a scartamento ridotto che utilizza ancora locomotive a vapore. Questa volta, i partecipanti potranno ancora una volta approfondire la storia tra una lezione e l’altra sulle ferrovie moderne. Il giorno prima, il 24 novembre, si terrà anche un giro speciale in treno a vapore.

Vale quindi la pena venire a Radebeul in questi giorni per molti motivi! Informazioni e iscrizioni: info@vdei-akademie.de

Dr. Jürgen Murach, Vicepresidente del VDEI



VDEI President Prof. Dr. Birgit Milius during the conference.

La presidente della VDEI, Prof.ssa Dott.ssa Birgit Milius, durante la conferenza.

Naples - Napoli



Source/credits: Cristian1989 - http://it.wikipedia.org/wiki/File:Napoli-metro_2012.png
<http://www.openstreetmap.org>

To our Partners and Pioneers

SHAPING THE FUTURE OF RAIL: A WELCOME FROM THE UEEIV PRESIDENT

The future of European mobility and railway logistics is being written on the concrete foundations of slab track technology. It is not merely an engineering choice; it is the bedrock for the next generation of high-speed, high-capacity, and sustainable rail systems.

It is therefore with great conviction that I, on behalf of the Union of European Railway Engineer Associations (UEEIV), invite the global railway community to a pivotal gathering: the **Railway Forum Napoli 2025**. This November, in the iconic setting of the National Railway Museum of Pietrarsa, we will bridge our illustrious past with a bold vision for tomorrow, together with our hosts, the Collegio Ingegneri Ferroviari Italiani (CIFI).

Our focus on **“Slab Track: Advanced solutions for railway, underground and tramway track systems,”** is a direct response to the industry’s most pressing needs. This forum is designed as an innovation crucible, where we will move from theory to application by tackling core challenges:

- **Engineering Resilience:** Creating systems that adapt intelligently to diverse terrains and geological pressures.
- **Silent Integration:** Mastering vibration and noise control for seamless urban and environmental coexistence.
- **Lifecycle Intelligence:** Leveraging data and new materials for infrastructure that is smarter, more durable, and more economical throughout its lifetime.



A highlight of Italy’s railway history: the Pietrarsa Museum in Naples.

Un punto culminante della storia ferroviaria italiana: il Museo di Pietrarsa a Napoli.

This is more than a conference; it is a platform for co-creation. We bring together project leaders, design pioneers, and technology providers to share breakthroughs, challenge conventions, and define the standards that will carry us forward.

We extend this invitation not just to attend, but to actively participate, network, and help forge the path forward.

Join us in Naples. Let’s build the future of rail, together.

With best regards,

Dipl.-Ing. Olaf Scholtz-Knobloch
President
Union of European Railway Engineer Associations (UEEIV)

Credits: Fondazione FS



There are various variations of slab track; here’s an example from PORR.

Esistono diverse varianti di binario a lastra; ecco un esempio da PORR.

Credits: Porr

Ai nostri partner e pionieri

DARE FORMA AL FUTURO DELLE FERROVIE: IL BENVENUTO DEL PRESIDENTE DELL’UEEIV

Il futuro della mobilità e della logistica ferroviaria europea si basa sulle solide fondamenta della tecnologia dei binari a soletta. Non si tratta semplicemente di una scelta ingegneristica; è il fondamento per la prossima generazione di sistemi ferroviari ad alta velocità, alta capacità e sostenibili. È quindi con profonda convinzione che, a nome dell’Unione delle Associazioni degli Ingegneri Ferroviari Europei (UEEIV), invito la comunità ferroviaria globale a un incontro fondamentale: il Railway Forum Napoli 2025. Questo novembre, nell’iconica cornice del Museo Nazionale Ferroviario di Pietrarsa, uniremo il nostro illustre passato con una visione audace per il futuro, insieme ai nostri ospiti, il Collegio Ingegneri Ferroviari Italiani (CIFI).

Il nostro focus su “Binari a soletta: soluzioni avanzate per sistemi ferroviari, metropolitani e tranviari” è una risposta diretta alle esigenze più urgenti del settore. Questo forum è concepito come un crogiolo di innovazione, in cui passeremo dalla teoria all’applicazione affrontando le sfide principali:

- **Resilienza ingegneristica:** creazione di sistemi che si adattano in modo intelligente a diversi terreni e pressioni geologiche.
- **Integrazione silenziosa:** controllo ottimale delle vibrazioni e del rumore per una coesistenza urbana e ambientale senza soluzione di continuità.
- **Lifecycle Intelligence:** sfruttare i dati e i nuovi materiali per realizzare infrastrutture più intelligenti, più durevoli e più economiche per tutta la loro durata.

Questa è più di una conferenza: è una piattaforma di co-creazione. Riuniamo project leader, pionieri del design e fornitori di tecnologia per condividere innovazioni, sfidare le convenzioni e definire gli standard che ci porteranno avanti. Vi invitiamo non solo a partecipare, ma a partecipare attivamente, fare networking e contribuire a tracciare il percorso futuro. Unisciti a noi a Napoli. Costruiamo insieme il futuro delle ferrovie.

Cordiali saluti,
Ingegnere Olaf Scholtz-Knobloch
Presidente
Unione delle Associazioni Europee degli Ingegneri Ferroviari (UEEIV)

Hupac CEO Michail Stahlhut: “I’m thrilled about Italy!”

Despite major challenges on the European rail network, Hupac achieved a positive group result in 2024 and a virtually stable transport volume in transalpine traffic through Switzerland. The Swiss logistics company explains this in its current annual report. In the 2024 financial year, the Hupac Group transported approximately 949,000 road consignments, or 1,818,000 TEU, in combined road/rail transport and maritime hinterland transport.

Starting September 1, 2025, Hupac will be strengthening intermodal traffic between Busto Arsizio and Basel with three new weekly round trips. This will increase total capacity to eight departures per week. The increase in frequency aims to offer an even more competitive service and ensure greater operational flexibility and loading capacity on the route between north-west Italy and northern Switzerland, HUPAC explained. From the Busto Arsizio terminal, Hupac continues to offer gateway solutions with daily departures to Pomezia, Marcanise, and Bari.

The company previously announced that, starting April 28, 2025, intermodal traffic between Busto Arsizio and Padova will be relocated to the Novara terminal. This measure serves to further optimise the network and will bring, among other benefits: improved transit times and greater operational stability, explained HUPAC (see charts). Our editorial team spoke with the CEO of the Hupac Group and Managing Director of Hupac Intermodal.



Michail Stahlhut

Credits: Hermann Schmidendorf

? CARGO FREIGHT JOURNAL/rail & mobility:

Your company primarily serves the north-south axis in Europe. What role does Italy play for you?

Michail Stahlhut: Italy is our core market. Our heritage is Italian. We live south of the Alps. Although we live in Switzerland, we have a very strong focus on Lombardy, Piedmont, and southern Italy. This accounts for a very large portion of our traffic volume. And here we also feel responsible for providing intermodal services towards southern Italy.

? Are you satisfied with the infrastructure there?

Let me tell you, Europe has turned around. What was said about the railways in Italy, especially 30 years ago, is now the case in Germany. We have strikes in Germany, we have unreliable infrastructure in Germany; we have to build in Germany. In Italy, they built in the north, and in Italy, they brought a valuable high-speed network with really great products to market. They are continuing to build the 4-metre corridor. That's not such a big issue in Germany, a relatively flat country. In Italy, they have tunnels here and there, where construction projects are more demanding. Italy sticks to its promises. I think Germany should do the same in the future. And I'm sure we have enough German engineers and enough German network planners who will manage it. ►

? I read an Italian publication a few years ago. A “strike calendar” was printed. It detailed every planned strike for the entire country and across all sectors, including whether it would be local, regional, or nationwide. This allowed those affected to plan months in advance. In Germany, on the other hand, there were strikes kept secret until the last day, which placed a great burden on the uninvolved population. I found the discipline shown during the Italian strikes quite astonishing.

A lot has changed in recent years and decades, including the numbers. I'm also fascinated by the accuracy that exists in certain areas, by the planning

assistance that is provided, by the exchange with partners online. Of course, every infrastructure has its challenges. **I'm positively enthusiastic about Italy, how they've approached their issues, which products they're bringing to market in passenger and freight transport, and how we're accomplishing these tasks together with our Italian partners.**

! That sounds like a wonderful partnership! Mr. Stahlhut, thank you very much for the interview!

The interview was conducted by Hermann Schmidendorf.

A HUPAC train on its way through Europe.

Un treno HUPAC in viaggio attraverso l'Europa.



Credits: Hupac

INTERVISTA

Il CEO di Hupac Michail Stahlhut:
“L’ITALIA MI ENTUSIASTA!”



Nonostante le grandi sfide sulla rete ferroviaria europea, Hupac ha conseguito un risultato di gruppo positivo nel 2024 e un volume di trasporto pressoché stabile nel traffico transalpino attraverso la Svizzera. L’azienda logistica svizzera lo spiega nel suo attuale rapporto annuale. Nell’esercizio 2024, il Gruppo Hupac ha trasportato circa 949.000 spedizioni stradali, pari a 1.818.000 TEU, nel trasporto combinato strada/rotaia e nel trasporto marittimo dell’entroterra.

A partire dal 1° settembre 2025, Hupac potenzierà il traffico intermodale tra Busto Arsizio e Basilea con tre nuovi viaggi di andata e ritorno settimanali. Ciò porterà la capacità totale a otto partenze a settimana. L’aumento della frequenza mira a offrire un servizio ancora più competitivo e a garantire una maggiore flessibilità operativa e capacità di carico sulla tratta tra l’Italia nordoccidentale e la Svizzera settentrionale, ha spiegato HUPAC. Dal terminal di Busto Arsizio, Hupac continua a offrire soluzioni gateway con partenze giornaliere per Pomezia, Marcanise e Bari.

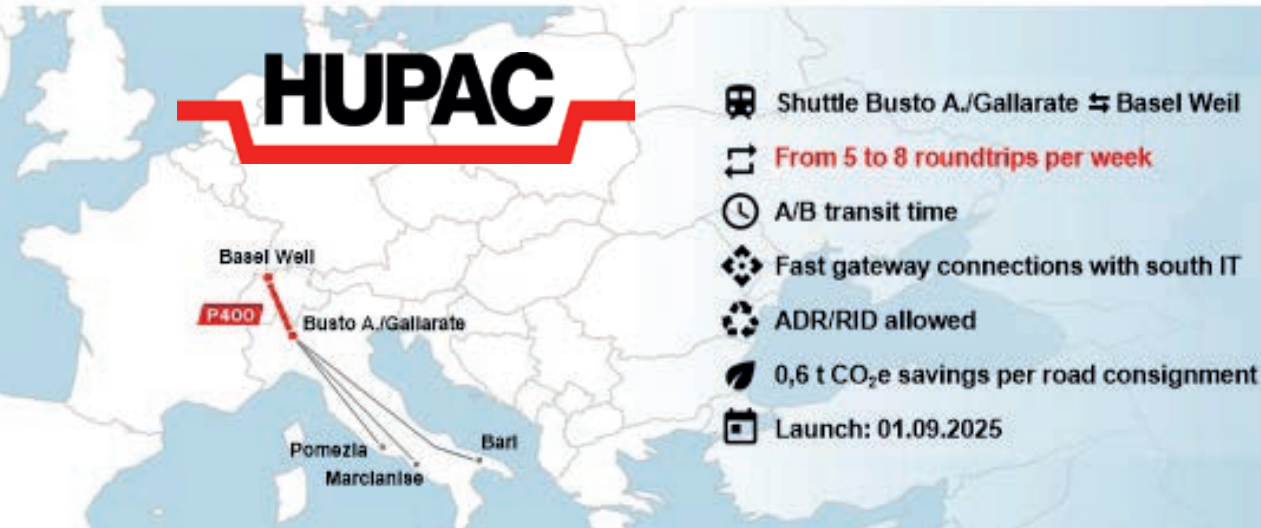
L’azienda aveva precedentemente annunciato che, a partire dal 28 aprile 2025, il traffico intermodale tra Busto Arsizio e Padova sarà trasferito al terminal di Novara. Questa misura contribuisce a ottimizzare ulteriormente la rete e porterà, tra gli altri vantaggi: tempi di transito più rapidi e maggiore stabilità operativa, ha spiegato HUPAC (vedi grafici). La nostra redazione ha parlato con il CEO del Gruppo Hupac e Amministratore Delegato di Hupac Intermodal.

? CARGO FREIGHT JOURNAL/rail & mobility: La vostra azienda serve principalmente l’asse nord-sud in Europa. Che ruolo gioca l’Italia per voi?

Michail Stahlhut: L’Italia è il nostro mercato principale. La nostra tradizione è italiana. Viviamo a sud

delle Alpi. Sebbene viviamo in Svizzera, ci concentriamo molto su Lombardia, Piemonte e Italia meridionale. Questo rappresenta una parte molto importante del nostro volume di traffico. E anche qui ci sentiamo responsabili di fornire servizi intermodali verso l’Italia meridionale. ►

Strengthening the north-west Italy-Switzerland corridor
Shuttle train Busto A./Gallarate ⇌ Basel Weil



? Siete soddisfatti delle infrastrutture lì?

Lasciatemelo dire, l’Europa ha cambiato rotta. Quello che si diceva delle ferrovie in Italia, soprattutto 30 anni fa, ora vale anche per la Germania. In Germania abbiamo scioperi, abbiamo infrastrutture inaffidabili, dobbiamo costruire in Germania. In Italia hanno costruito al nord e hanno immesso sul mercato una preziosa rete ad alta velocità con prodotti davvero eccellenti. Stanno costruendo di più il corridoio di 4 metri. Non è un problema così grave in Germania, un paese relativamente pianeggiante. In Italia ci sono gallerie qua e là, dove i progetti di costruzione sono più impegnativi. L’Italia mantiene le sue promesse. Penso che la Germania dovrebbe fare lo stesso in futuro. E sono sicuro che abbiamo abbastanza ingegneri e progettisti di reti tedeschi che sapranno gestirlo.

? Ho letto una pubblicazione italiana qualche anno fa. È stato pubblicato un “calendario degli scioperi”. Descriveva dettagliatamente ogni sciopero pianificato per l’intero paese e in tutti i settori, specificando anche se sarebbe stato locale, regionale o na-

zionale. Questo ha permesso alle persone interessate di pianificare con mesi di anticipo. In Germania, invece, ci sono stati scioperi tenuti segreti fino all’ultimo giorno, il che ha rappresentato un grande peso per la popolazione non coinvolta. Ho trovato la disciplina dimostrata durante gli scioperi italiani davvero sorprendente.

Molto è cambiato negli ultimi anni e decenni, compresi i numeri. Sono anche affascinato dalla precisione che esiste in alcuni ambiti, dall’assistenza alla pianificazione fornita, dallo scambio con i partner online. Naturalmente, ogni infrastruttura presenta le sue sfide. **Sono assolutamente entusiasta dell’Italia, di come hanno affrontato le loro problematiche, dei prodotti che stanno immettendo sul mercato nel trasporto passeggeri e merci e di come stiamo portando a termine questi compiti insieme ai nostri partner italiani.**

? Sembra una partnership meravigliosa! Sig. Stahlhut, grazie mille per l’intervista!

L’intervista è stata condotta da Hermann Schmidtendorf.

Linking north-east Italy to Novara and Europe
Shuttle train Novara ⇌ Padova





The narrow-gauge hydrogen-powered Stadler train for FCE.

Il treno Stadler a scartamento ridotto alimentato a idrogeno per FCE.

NARROW-GAUGE RAILWAYS IN SOUTHERN ITALY

Cost considerations and sometimes difficult topographical conditions led to the construction of narrow-gauge railways in various regions of Italy. A specific measuring method resulted in the predominant track gauge in Italy being different from that in most other European countries. The “Italian metre gauge” has a rail centre-to-centre distance of 1,000 mm. However, if measured as is customary in Europe—from the inside of the rail—the result is a track gauge of 950 mm.

The **Ferrovie Appulo Lucane (FAL)** and the **Ferrovia Circumetnea (FCE)** are still active narrow-gauge railways in southern Italy with a track gauge of 950 mm. Following the complete closure of **Sicily’s** formerly extensive narrow-gauge railway network, the FCE is the last remaining nar-

row-gauge railway of the **Italian state railway FS** on the island. It was built around Mount Etna between 1889 and 1895 and is currently 111 km long. FAL operates a 183 km railway network in the regions of **Apulia** and **Basilicata**. FAL is a subsidiary of the Ministry of Transport. *hfs*

STADLER Rail delivers tailor-made narrow-gauge trains to Italy:

ECOLOGICAL TRAIN OPERATION WITH ELECTRIC BATTERIES AND HYDROGEN

Italy’s narrow-gauge railways are committed to ecological train operations. This was demonstrated again at Italy’s leading railway trade fair, **EXPO Ferroviana**, in Milan. On October 1, 2025, the railway company FAL presented the first of seven trains at

the trade fair, which are scheduled to enter service on the Altamura – Matera line by the end of 2026. The supplier of the first customised battery train for Europe is Stadler Rail. The trains will be manufactured at Stadler’s headquarters in Bussnang, Switzerland. ►

INFO

950 mm GAUGE BATTERY ELECTRIC MULTIPLE UNITS (BEMU)

Each BEMU for the **Ferrovie Appulo Lucane (FAL)** railway consists of two passenger cars, each equipped with a motor and a trailer bogie, with very low axle load. To allow a safe operation, the BEMUs are equipped with SCMT automatic train protection. The high performance battery powered propulsion equipment is located above the motor bogie to ensure excellent adhesion in all weather and operating conditions. A dedicated pantograph allows the **recharging of the batteries at the end station and the depot**. All main components are easily accessible for routine maintenance.

Two doors per car and low-floor vestibules enable easy access on board for all passengers including those with reduced mobility. Dedicated sliding steps allow as well a comfortable boarding from 250mm height platforms. One car is equipped with a universal PRM toilet and special areas for E-bikes or strollers. The air conditioning system features **a set of air purifiers**, aimed to increase air quality. Comfortable seats, wide panoramic windows, energy-saving LED lighting, 220V and USB sockets at each seat, a modern Wi-Fi and an integrated passenger information system complete the set of features to ensure a pleasant travel experience for all passengers.

- **Total seats** 87
- **Flip-up seats** 12
- **Embedded multiple-unit control** (up to three units)
- **Tractive effort at start-up** 120 kN
- **Acceleration at start-up** 0.9 m/s²
- **Design speed** 120 km/h
- **Operational speed** 100 km/h
- **Low-floor at entrance** 519 mm
- **High-floor** 945/1039 mm



950 mm GAUGE HYDROGEN ELECTRIC MULTIPLE UNITS (HEMU)

Each hydrogen train for the **Ferrovia Circumetnea (FCE)** railway consists of two passenger cars and a “power pack” between them for the fuel cells and the sealed modular hydrogen tanks. The vehicles have 87 seats and can accommodate a total of 147 passengers. They are also equipped with universal PRM toilets and feature low entry. They are equipped with **two independent drive chains**, water-cooled electronic converters and highly efficient asynchronous traction motors. The trains feature special areas for passengers with bicycles and/or strollers. **The particularly low axle load of less than 11 tons per axle** allows them to be used on the entire narrow-gauge network operated by FCE.

- **Modern design with functional and bright car bodies** made of light alloys in the interior
- **Lithium titanate traction batteries (LTO)** for high recuperation
- **Embedded multiple control** (up to two units)
- **Large low-floor vestibules on both sides** allow easy access for passengers with reduced mobility and elderly passengers
- **1 PRM toilet** in the low-floor area
- **Independent HVAC systems** in passenger and driver cabs
- **Air suspension for bogies** to ensure maximum ride quality and optimal comfort for passengers
- **Efficient, energy-saving LED lighting**
- **Passenger information system** and VSS
- Connection to the **on-board Wi-Fi network**
- **220V and USB sockets** at seats
- **Ergonomically designed, functional driver’s cab** according to the new crash standard EN 15227 with independent access doors for the drivers
- Traction vehicle according to EN 45545 and UNI 11565 for **fire detection and fire fighting** *hfs/sr*

The interior seats of the battery train.

Sedili interni per treni a batteria su misura.

Vittorio Zizza, President of Ferrovie Appulo Lucane, explained: "The goal is to decarbonise rail transport. FAL has been a company with a strong 'green' focus for years. We are achieving this thanks in part to the foresight of the Basilicata region, which has consistently encouraged and supported us in these bold and innovative investments." This is why the company calls its new trains "TREEN" – a reference to "Green Train."

The new zero-emission battery trains feature a powerful battery-powered drive system installed above the motor vehicle. This ensures good grip and optimal traction in all weather and operating conditions. The batteries have a large capacity, short charging times, and high operating autonomy. The new trains offer passengers comfortable, functional, and bright interiors, as well as large panoramic windows. The low-floor entrance allows easy boarding even for passengers with limited mobility.

Battery trains for Puglia, hydrogen trains for Sicily
Hydrogen trains were also a topic at this year's EXPO Ferroviaria trade fair. There, FCE signed the first contract for the manufacture and delivery of two customised narrow-gauge trains with zero-emission

hydrogen propulsion. The framework agreement is the result of a public tender won by Stadler Rail. The contract includes options for ordering a further 13 trains. The delivery of the first two trains also includes five years of full service and technical spare parts.

"We thank FCE for the trust they have placed in us and for being part of the Italian Green Technology team. The trains ordered by FCE will contribute to the decarbonisation of Italian rail transport in a new region, thus further expanding Stadler's presence in the Italian market," said Maurizio Oberti, Sales & Marketing Director Italy at Stadler. Particular attention was paid to the propulsion system. The Circumetnea line is characterised by steep gradients. The static converter and traction batteries are located above the motor cars to ensure excellent traction and optimal tractive effort in all weather conditions.

With the new order from FCE, the total number of Stadler narrow-gauge hydrogen trains for the Italian market increases to 19. The trains were ordered by three different customers in three regions of Italy: eight vehicles from ARST (Sardinia region) and nine from FdC (Calabria region). These are the world's first tailor-made narrow-gauge hydrogen-powered trains powered by fuel cells. hfs

ABSTRACTS

STADLER Rail fornisce treni a scartamento ridotto su misura per l'Italia
FUNZIONAMENTO ECOLOGICO DEI TRENI CON BATTERIE ELETTRICHE E IDROGENO

Le Ferrovie Appulo Lucane (FAL) e la Ferrovia Circumetnea (FCE) sono ancora attive nell'Italia meridionale, con uno scartamento di 950 mm. In seguito alla completa chiusura dell'ex ed estesa rete ferroviaria a scartamento ridotto siciliana, la FCE è l'ultima linea ferroviaria a scartamento ridotto delle FS rimasta sull'isola. Fu costruita attorno all'Etna tra il 1889 e il 1895 e attualmente è lunga 111 km. Le FAL gestiscono una rete ferroviaria di 183 km nelle regioni Puglia e Basilicata. Le FAL sono una società controllata dal Ministero dei Trasporti.

EXPO Ferroviaria, la principale fiera ferroviaria italiana, si tiene a Milano. Il 1° ottobre 2025, la compagnia ferroviaria FAL ha presentato il primo dei sette treni in fiera, la cui entrata in servizio sul-

la linea Altamura-Matera è prevista entro la fine del 2026. Stadler Rail è il fornitore del primo treno a batteria personalizzato per l'Europa. I treni saranno prodotti presso la sede centrale di Stadler a Bussnang, in Svizzera. Vittorio Zizza, presidente delle Ferrovie Appulo Lucane, ha spiegato: "L'obiettivo è decarbonizzare il trasporto ferroviario. FAL è da anni un'azienda con una forte attenzione all'ambiente. Stiamo raggiungendo questo obiettivo anche grazie alla lungimiranza della Basilicata, che ci ha costantemente incoraggiato e supportato in questi investimenti coraggiosi e innovativi".

Per questo motivo, l'azienda chiama i suoi nuovi treni "TREEN", ovvero "Treno Verde". I nuovi treni a batteria a zero emissioni sono dotati di un potente sistema di propulsione a batteria montato sul ve- ►

colo a motore. Ciò garantisce un'ottima aderenza e una trazione ottimale in tutte le condizioni atmosferiche e operative. Le batterie hanno un'elevata capacità, tempi di ricarica brevi e un'ampia autonomia. I nuovi treni offrono ai passeggeri interni confortevoli, funzionali e luminosi, oltre a grandi finestre panoramiche. L'ingresso a pianale ribassato facilita l'accesso anche ai passeggeri con mobilità ridotta.

TRENI A BATTERIA PER LA PUGLIA, TRENI A IDROGENO PER LA SICILIA

I treni a idrogeno sono stati oggetto di discussione anche alla fiera EXPO Ferroviaria di quest'anno. In quell'occasione, FCE ha firmato il primo contratto per la produzione e la consegna di due treni personalizzati a scartamento ridotto alimentati a idrogeno a zero emissioni. L'accordo quadro è il risultato di una gara pubblica vinta da Stadler Rail. Il contratto include opzioni per l'ordine di altri 13 treni. La consegna dei primi due treni include anche cinque anni di assistenza completa e ricambi tecnici.

"Ringraziamo FCE per la fiducia riposta in noi e per la partecipazione al team Green Technology italiano. I treni ordinati da FCE contribuiranno alla decarbonizzazione del trasporto ferroviario italiano in una nuova regione, espandendo così la presenza di Stadler sul mercato italiano", ha dichiarato Maurizio Oberti, Direttore Vendite e Marketing di Stadler per l'Italia. Particolare attenzione è stata dedicata al sistema di propulsione. La linea Circumetnea è caratterizzata da forti pendenze. Il convertitore statico e le batterie di trazione sono posizionati sui carri per garantire un'eccellente trazione e uno sforzo di trazione ottimale in tutte le condizioni meteorologiche.

Con il nuovo ordine da FCE, il numero totale di treni a scartamento ridotto a idrogeno di Stadler per il mercato italiano sale a 19. I treni sono stati ordinati da tre diversi clienti in tre regioni italiane: otto veicoli da ARST (Sardegna) e nove da FdC (Calabria). Si tratta dei primi treni a scartamento ridotto personalizzati al mondo con propulsione a idrogeno e celle a combustibile. hfs

UNITÀ MULTIPLE ELETTRICHE A BATTERIA (BEMU)
Ogni BEMU sulla linea ferroviaria delle Ferrovie Appulo Lucane (FAL) è composta da due carrozze

passeggeri, ciascuna dotata di un carrello motore e di un carrello rimorchio, con un carico assiale molto basso. Per garantire un funzionamento sicuro, le BEMU sono dotate di protezione automatica del treno SCMT. Il sistema di propulsione a batteria ad alte prestazioni è posizionato sopra il carrello motore per garantire un'aderenza eccellente in tutte le condizioni meteorologiche e operative. Un pantografo dedicato consente la ricarica della batteria in stazione terminale e in deposito. Tutti i componenti principali sono facilmente accessibili per la manutenzione ordinaria. Due porte per carrozza e vestiboli a pianale ribassato facilitano l'accesso a bordo a tutti i passeggeri, compresi quelli con mobilità ridotta.

Gradini scorrevoli dedicati consentono inoltre un comodo accesso da banchine alte 250 mm. Una carrozza è dotata di un bagno universale per PRM e di aree dedicate per biciclette elettriche o passeggini. L'impianto di aria condizionata è dotato di una serie di purificatori d'aria per migliorare la qualità dell'aria. Sedili comodi, ampi finestrini panoramici, illuminazione a LED a risparmio energetico, prese da 220 V e USB su ogni sedile, Wi-Fi moderno e un sistema integrato di informazioni per i passeggeri completano la gamma di servizi per garantire un'esperienza di viaggio piacevole a tutti i passeggeri.

UNITÀ MULTIPLE ELETTRICHE A IDROGENO (HEMU)
Ogni treno a idrogeno della Ferrovia Circumetnea (FCE) è composto da due carrozze passeggeri e da un sistema di propulsione intermedio per le celle a combustibile e i serbatoi modulari di idrogeno sigillati. I veicoli dispongono di 87 posti a sedere e una capacità totale di 147 passeggeri. Sono inoltre dotati di servizi igienici universali per persone a mobilità ridotta (PRM) e di accesso ribassato. Sono dotati di due catene di trasmissione indipendenti, convertitori elettronici raffreddati ad acqua e motori di trazione asincroni ad alta efficienza. I treni dispongono di aree dedicate per i passeggeri con biciclette e/o passeggini. Il loro carico assiale particolarmente basso, inferiore a 11 tonnellate per asse, ne consente l'utilizzo sull'intera rete a scartamento ridotto gestita da FCE. hfs/sr

Steam locomotives from England, electric locomotives from Hungary:

DIFFICULT TOPOGRAPHY, LACK OF NATION-STATE – ITALY'S RAILWAYS DIDN'T HAVE IT EASY

In the beginning there was Naples. The first railway line on what is now Italian soil began operations on October 3, 1839. It was 7.6 km long and ran from Naples to Granatello di Portici. The supplier of the first two steam locomotives was the British locomotive factory R.B. Longridge and Co. in Bedlington. The same factory also delivered the first two locomotives for the public railways in the Netherlands that same year. The founder of the locomotive factory, Michael Longridge Sr., had gained his knowledge as a previous partner of the pioneering factory Robert Stephenson Co. in Newcastle. **These locomotives introduced the 1,435 mm gauge established by Stephenson to what was then the Kingdom of Naples.**

The exact name was "Kingdom of the Two Sicilies" and included not only Sicily with its capital, Palermo, but also the south of the Apennine Peninsula, with its capital, Naples, as well as the then Papal States around Rome. **At that time, the north of present-day Italy was particularly under strong French and Austrian influence. As a result, a continuous railway network could not be developed at first. Initially, only shorter regional railway lines were built.** This included the second railway on what is now Italian soil, the 13 km long Monza-Milan line, opened on August 18, 1840. It was also the second oldest railway with locomotives in the former Austrian Empire. On October 2, 1857, the then 285 km long railway line from Milan to Venice began operations. The 266 km long route via Treviglio and Rovato-Brescia, without the detour via Bergamo, which still exists today, opened on March 5, 1878. Today, it is one of the most important main lines in Italy.

Rise of the railway in united Italy

Key steps towards a united Italy were the founding of the Kingdom of Italy in 1861 un- ►

This replica of the first Italian steam locomotive, the "Bayard," is on display in the FS Railway Museum in Pietrarsa.

Questa replica della prima locomotiva a vapore italiana, la "Bayard", è esposta nel Museo Ferroviario delle FS di Pietrarsa.



Credits: Reinhard Dietrich

der Victor Emmanuel I, the annexation of Lombardy and Veneto in 1866, and the capture of Rome in 1870. The privately owned Milan-Venice railway then became part of the state railway, the Società per le Strade Ferrate dell' Alta Italia. In 1860, 1,800 km of track were in operation, of which 350 km belonged to the state, and the remaining 1,450 km to seven joint-stock companies. Between 1860 and 1867, 2,800 km of new lines were built. By 1872, there were almost 7,000 km of railway lines in Italy, of which 6,470 km were operated by the four largest railway companies. **In 1905, the Italian State Railways, Ferrovie dello Stato Italiane (FS), was founded. Three of the leading railway companies that had existed up to that point were nationalized. As of July 1, 1906, the FS operated 13,232 km,** as recorded by Victor Freiherr von Röhl in 1914 in his fact-rich standard work "Encyclopedia of Railways".

Underinvestment in infrastructure and rolling stock, as well as a 10.24% increase in rail traffic in the first year of operation, required massive investment by the new state railway. As a result, new railway lines were also built by the state, including the access lines to the Simplon Pass, Borgoniano-Arona, and Domodossola-Iselle. Direct lines such as Bologna-Florence were also built to facilitate crossings over the Apennines. In 1912, a further 3,909 km of railway lines were privately operated by 55 companies. Of these, 2,417 km were standard gauge

and 1,492 km were narrow gauge, predominantly with a track gauge of 950 mm. **On June 1, 1912, the state railway owned 5,021 locomotives, 151 railcars, 10,037 passenger cars, 3,371 baggage cars, and 92,990 freight cars.**

Electrification „in Italiano“: 3 kv 15 hz; 3,3 kv 16½ hz; 3,6 kv 16½ hz; 3kv

The electrification of the railways in Italy is a particular asset. It began early, as steam locomotives were too weak on lines with gradients and numerous tunnels. Electric operation with locomotives supplied by the Hungarian company Ganz & Cie., however, showed positive results. In 1902, the railway company Rete Adriatica (RA) opened the Valtellina Railway (Tirano-Colico-Lecco). It was the world's first high-voltage electrified main line. Ganz & Cie. also supplied the power supply with three-phase alternating current (3 kV and 15.6 Hz).

The locomotives supplied at that time were powered by asynchronous motors. This meant that speeds could only be changed by pole-changing. Continuously variable speed control was developed later. Common speed settings were 35, 50, 75, and 100 km/h. The need to install two-pole overhead lines in switch areas was also complex. Nevertheless, the "Trifase" system spread throughout northern Italy. The technology was robust, had positive ex- ►

A scene from 1916: The electric locomotive E.550.050 pulls a stylish passenger train in Albisola on the Genoa - Savona line.

Una scena del 1916: la locomotiva elettrica E.550.050 traina un elegante treno passeggeri ad Albisola sulla linea Genova – Savona.



Credits: FS, Collection Gianfranco Ferro

perience, and was inexpensive. Therefore, the system remained in operation in some parts of the state railway until 1976.

The second and largest sub-network stretched along the Ligurian coast. Starting in 1908, it ran from Genoa across the Apennines to Ronco. A slightly modified voltage of 3,600 volts with a frequency of 16 ⅔ Hertz was used. In the following years, the line was electrified further via Turin to the Mont Cenis Tunnel. In 1920, Modane on the French border was reached. In 1921/22, the gap between Ronco and Turin was closed. The Valtellina Railway also ran on 3.6 kV/16 ⅔ Hz three-phase current between 1930 and 1952. In 1927, electric operation between Brennero and Bolzano (89 km) began at the same voltage. In 1934, the Bolzano-Trento (56 km) and Bolzano-Merano (30 km) sections followed.

At the same time, electrification with 3000 volts direct current was introduced and expanded under Prime Minister Benito Mussolini (1922–1943). In 1928, the Benevento–Napoli (100 km) and

Benevento–Foggia (101 km) lines were electrified with 3 kV direct current. In 1938, the 41 km Livorno–Pisa–Viareggio line was converted to 3 kV DC. The three-phase current equipment on the Roma–Sulmona line was also dismantled after World War II, and the line was rebuilt with 3 kV direct current. By December 31, 1939, the Ferrovie dello Stato (FS) had electrified a total of 5,131 kilometers of track. The trade magazine "Der Lok-Vogel" provides the following breakdown in its issues 64 to 66 – January to March 2011:

3,088 km under 3 kV DC. 1,849 km under three-phase current 3.6 kV 16 ⅔ Hz. 92 km under three-phase current 3.3 kV 16 ⅔ Hz. 72 km under 650 V DC with side rail (Milano - Varese - Porto Ceresio). 30 km under 15 kV 16 ⅔ Hz (Simplon Railway Domodossola - Iselle di Trasquera).

Of the 18,000 kilometres of standard gauge lines in Italy, approximately 11,000 kilometres are currently electrified.

Hermann Schmidtendorf



A 2017 Italian law on historic railways currently places 13 historic, rarely used railway lines under monument protection. To reuse them, the FS Foundation – Fondazione FS – developed the "Binari senza Tempo" project. Between 2014 and 2022, ten lines, which range in length from 12 km to 119 km, were reactivated. FS explains: "These lines, which are hardly or no longer used for commuter or freight traffic, have great potential. You can travel through unique landscapes and discover little-known areas still untouched by mass tourism." Special tours can be booked as a "mobile museum." This allows you to discover "hidden Italy": beautiful small towns and stunning landscapes are revealed to the viewer – a great example of gentle and sustainable tourism. *hfs/fsf*

Una legge italiana del 2017 sulle ferrovie storiche ha attualmente posto sotto tutela monumentale 13 linee ferroviarie storiche, raramente utilizzate. Per riutilizzarle, la Fondazione FS ha sviluppato il progetto "Binari senza Tempo". Tra il 2014 e il 2022, 10 linee, che vanno da 12 km a 119 km, sono state riattivate. FS spiega: "Queste linee, poco o per nulla utilizzate per il traffico pendolare o merci, hanno un grande potenziale. Si possono attraversare paesaggi unici e scoprire aree poco conosciute, ancora incontaminate dal turismo di massa". È possibile prenotare tour speciali come "musei itineranti". Questo permette di scoprire "l'Italia nascosta": splendide cittadine e paesaggi mozzafiato si svelano allo spettatore, un ottimo esempio di turismo dolce e sostenibile. *hfs/fsf*

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ABSTRACTS

Topografia difficile, mancanza di nazionalità:
LE FERROVIE ITALIANE NON HANNO AVUTO VITA FACILE ALL'INIZIO

In principio, c'era Napoli. La prima linea ferroviaria su quello che oggi è suolo italiano entrò in funzione il 3 ottobre 1839. Era lunga 7,6 km e andava da Napoli a Granatello di Portici. La fabbrica di locomotive britannica R.B. Longridge and Co. di Bedlington fornì le prime due locomotive a vapore. La stessa fabbrica consegnò anche le prime due locomotive per le ferrovie pubbliche nei Paesi Bassi nello stesso anno. Il fondatore della fabbrica di locomotive, Michael Longridge Sr., aveva acquisito le sue competenze come precedente socio della pionieristica fabbrica Robert Stephenson Co. di Newcastle. Con queste locomotive, lo scartamento da 1.435 mm stabilito da Stephenson giunse in quello che allora era il Regno di Napoli.

A quel tempo, il nord dell'attuale Italia era particolarmente sotto la forte influenza francese e austriaca. Di conseguenza, inizialmente non fu possibile sviluppare una rete ferroviaria continua. Inizialmente furono costruite solo linee ferroviarie regionali più brevi. Tappe chiave verso la formazione di un'Italia unita furono la fondazione del Regno d'Italia nel 1861 sotto Vittorio Emanuele I, l'annessione della Lombardia e del Veneto nel 1866 e la presa di Roma nel 1870. La linea ferroviaria privata Milano-Venezia entrò quindi a far parte della Società per le Strade Ferrate dell'Alta Italia delle ferrovie statali. Nel 1860 erano in esercizio 1.800 km di linea, di cui 350 km di proprietà dello Stato e i restanti 1.450 km di proprietà di sette società per azioni.

Nel 1905 furono fondate le Ferrovie dello Stato Italiane. Tre delle principali compagnie ferroviarie già esistenti furono nazionalizzate. Al 1° luglio 1906, le FS gestivano 13.232 km di binari, come riportato

da Victor Freiherr von Röhl nella sua opera fondamentale "Enciclopedia delle Ferrovie" del 1914. Successivamente, lo Stato costruì anche nuove linee ferroviarie. Il 1° giugno 1912, le Ferrovie dello Stato possedevano 5.021 locomotive, 151 automotrici, 10.037 carrozze passeggeri, 3.371 bagagliai e 92.990 carri merci.

ELETTRIFICAZIONE "IN ITALIANO": 3 kV 15 Hz; 3,3 kV 16⅔ Hz; 3,6 kV 16⅓ Hz; 3 kV

L'elettrificazione delle ferrovie in Italia è una risorsa particolare. Iniziò presto, poiché le locomotive a vapore erano troppo deboli su linee con pendenze e numerose gallerie. Tuttavia, **l'esercizio elettrico con locomotive fornite dalla società ungherese Ganz & Cie. diede risultati positivi.** Nel 1902, la società ferroviaria Rete Adriatica (RA) inaugurò la Ferrovia della Valtellina (Tirano-Colico-Lecco). Fu la prima linea principale elettrificata ad alta tensione al mondo. **Ganz & Cie. fornì anche la corrente alternata trifase (3 kV e 15,6 Hz). Il sistema "Trifase" si diffuse in tutto il Nord Italia. La tecnologia era robusta, aveva avuto esperienze positive ed era economica. Pertanto, il sistema rimase in uso in alcuni tratti delle Ferrovie dello Stato fino al 1976.** La seconda e più grande sottorete si estendeva lungo la costa ligure. Dal 1908, andava da Genova attraverso gli Appennini fino a Ronco. Veniva utilizzata una tensione leggermente modificata di **3.600 volt con una frequenza di 16,5 hertz.** Contemporaneamente, sotto il Primo Ministro Benito Mussolini (1922-1943), fu introdotta e ampliata l'elettrificazione a **corrente continua a 3.000 volt. Entro il 31 dicembre 1939, le Ferrovie dello Stato (FS) avevano elettrificato un totale di 5.131 chilometri di binari.**

La rivista specializzata "Der Lok-Vogel" fornisce la seguente ripartizione nei numeri da 64 a 66, da gennaio a marzo 2011: 3.088 km a 3 kV CC. 1.849 km di linea a corrente trifase a 3,6 kV 16 1/2 Hz. 92 km a corrente trifase a 3,3 kV 16 1/2 Hz. 72 km a 650 V CC con rotaie laterali (Milano - Varese - Porto Ceresio). 30 km a 15 kV 16 1/2 Hz (Ferrovia del Sempione Domodossola - Iselle di Trasquera).
Hermann Schmidtendorf

*The Treno Natura Toscana during a special trip.
Il Treno Natura Toscana durante un viaggio speciale.*



Credits: FS Fondazione

Direct rail lines, high investment:

ITALY'S RAIL NETWORK UNDERGOING MASSIVE MODERNISATION

High-speed train lines separated from the main rail network have played a key role in Italy's development by rail since 1927. They were called "Direttissima" (most direct route). The Rome-Naples line was followed in 1934 by the Bologna-Florence section. The overhead line voltage was 3 kV direct current, as was later the case for regional lines. The trains could reach top speeds of up to 200 km/h. At the end of 2009, the last remaining sections were completed. Since then, there has been a continuous 661-kilometer-long Direttissima high-speed network from Turin via Milan, Bologna, Florence, Rome, and Naples. It is also used by freight traffic.

New lines are being equipped with the European ETCS Level 2 safety system. The infrastructure administration has set a goal of increasing this equipment to 2,785 km by 2026. The maximum speed is 300 km/h, and the overhead line voltage on these sections is now 25 kV 50 Hz. In 2023, Italy had a standard-gauge railway network of 16,832 kilometres. Of this, 73 percent was electrified and 46 percent double-track. In addition, there are 210 kilometers of narrow-gauge lines with a track gauge of 950 mm on the Italian island of Sardinia. In the same year, Italy's railways transported 54,791 passenger kilometers (ERA 2025).

With 814.4 million rail passengers in 2023, Italy ranks third in EU statistics after Germany and France (destatis.de). With 280 kilometres of track per 1 million inhabitants, Italy's rail network ranked seventh in the EU in 2013 (**Federal Statistical Office Wiesbaden**). The railway infrastructure has

been managed by the state-owned company Rete Ferroviaria Italiana (RFI) since 2001. It manages 2,712 active railway stations (**ERA as of 2025**). The number of freight terminals is reported to be 53. In 2014, according to RFI, 21 freight and 19 passenger transport companies used the rail network, providing a total of 330 million train kilometres. At the end of 2024, RFI reportedly employed 32,555 people and invested €9.63 billion in the maintenance, development, and modernisation of the rail network – 28 percent more than the previous year.

In addition, the RFI business plan calls for investments of €115.4 billion between 2025 and 2034. The existing infrastructure is designed to accommodate trains with modules up to 750 metres long, a height of 4 metres, and an axle load of 22 tons. This strategy is in line with the EU strategy to increase rail freight transport by 30 percent by 2030 and by 50 percent by 2050.

hfs

*„The Italy of the future is underway”: a tunnel construction site of the RFI.
Numeri impressionanti: nel 2024, RFI ha investito 9,63 miliardi di euro nella rete. Con 814,4 milioni di passeggeri ferroviari nel 2023, l'Italia si colloca al terzo posto nelle statistiche UE dopo Germania e Francia.*



Credits: RFI



With a sweeping nose: a Frecciargento at Trieste station.

Con un muso slanciato: un Frecciargento alla stazione di Trieste.

Credits: Hermann Schmidtendorf

Railways in Italy:

COMPETITION IS BOOMING, BUT STATE RAILWAYS REMAIN DOMINANT

In 2000, the Italian state railway company FS was split up in accordance with EU directives. Now the FS Group includes, among others, the infrastructure company RFI and the passenger transport company Trenitalia. In early December 2010, the latter acquired the rail and bus company Arriva Deutschland from Deutsche Bahn, which subsequently renamed



Through the ages: the "television logo" and the current logo of the FS Group.
Attraverso i secoli: il "logo televisivo" e l'attuale logo del Gruppo FS.



Netinera. In 2017, the previously state-owned Greek railway company TrainOSE was sold to FS for €45 million. Since June 2022, the company

has been called Hellenic Train.

In 2021, we spoke with Dr. Fabrizio Favara, Director of Corporate Strategy, Planning, Control and Sustainability at FS. The rail strategist explained: "Internationalisation is one of the ►

pillars of FS Italiane's 2017-2026 industry plan. International business currently accounts for approximately 13 percent of total revenue. The plan envisages increasing the share of international business from €1 billion to €4 billion by 2026 and transforming FS into a global player in integrated mobility."

Dr. Favara pointed to the success of Netinera and its foreign freight subsidiary, TX Logistik, and continued: "We also operate in France with Thello and in the UK with c2c, a regional rail company with services between London and Essex. Busitalia, FS's bus company, owns Qbuzz, the third-largest Dutch public transport provider. We are determined to further digitise our offerings and are convinced that digitalisation will give a boost to public transport."

The concept is apparently working—also because FS modernised in a timely manner. This is already evident in the company logo. In 1966, the logo consisted of the letters FS in a bulbous frame that resembled the screen of an old television set. It was therefore humorously called the "Logo Televisore." But such an emblem would be rather outdated today, in the age of smartphones and flat screens. Since 2011, the logo has therefore included the curved letters fs in the colors of the Italian flag, complemented by the words "Ferrovie dello Stato Italiane" – Italian State Railways.

PENDOLINO – THE "ITALIAN TGV"

On February 27, 1982, the first "TGV" trains built by Alstom began commercial service in France on the specially built high-speed line from Paris to Lyon. TGV is the abbreviation for "train à grande vitesse" (high-speed train). The Italian counterpart is the ETR (Elettro Treno Rapido) – fast electric train. With the introduction of the ETR 450, Italy became the second country in Europe (after France with the TGV) where train traffic exceeded an average travel speed of 200 km/h. These were tilting trains that began service on the Rome–Milan route with the 1988 summer timetable. Manufacturers were Fiat Ferroviaria (now Alstom) and Ercole Marelli. The inclination was 8°, with the pantographs not tilting. In regular service, the trains were approved for speeds of up to 250 km/h. Curves could be negotiated up to 30 percent faster thanks to the side tilt. This significantly reduced travel times –

FS trains became synonymous with comfort and short travel times. The last train of this type in regular service, the ETR 450.03, was handed over to the FS Foundation of the Italian Railways (FS Italiane), in 2015 and refurbished for its historic vehicle fleet.

From December 2008, Trenitalia introduced nicknames for its high-speed trains that also indicate their maximum speed. The fastest train category, for speeds up to 350 km/h, is the Frecciarossa (Red Arrow) ETR 500. The second fastest category is Frecciargento (Silver Arrow), for top speeds between 250 and 285 km/h. The ETR600 series is dual-system capable of 3 kV direct current and 25 kV/50 Hz alternating current, while the ETR610 can also operate with an alternating current of 15 kV/16.7 Hz. The third type, Frecciabianca (White Arrow), operates at a top speed of 200 km/h only on the Italian direct current network.

NEOVO – COMPETITION ON FAST TRACKS

Since 2012, Trenitalia has had one major private competitor: the company NTV (Nuovo Trasporto Viaggiatori – New Passenger Transport), operating under the brand name Italo. Italo offers its own train services on part of the high-speed network. Its largest shareholder is the Mediterranean Shipping Company (MSC). According to the company, by 2025 it will serve 59 stations in 51 cities on 120 daily scheduled services. "Italo uses 25 Alstom AGV 575 (Automotrice Grande Vitesse) high-speed trains." The 200-meter-long train has 462 seats spread across eleven carriages and travels at speeds of up to 300 km/h on Italy's high-speed network. In addition, Italo uses 26 new EVO trains, also from Alstom. These reach a top speed of 250 km/h, consist of seven carriages, offer space for around 472 passengers, and represent a further development of the Pendolino series," the website states: <https://italospa.italotreno.it/en/index.html>.

A clear hint! Neovo orders the trains from the same company as Trenitalia; they have a "tilt" function like FS, so they are just as fast and comfortable as those of the state railway, or even better... ►



The European Railway Agency (ERA) reported in 2023 that Trenitalia's private Italian competitors now hold 11.3 percent of the market. Competition is apparently good for the environment, the trade magazine Rail Journal reported in 2019: The market share of rail operators on the Rome-Milan route rose from 36% in 2008 to an estimated 80% in 2018. Meanwhile, the share of air transport on this route fell from 50% to just 14% over the same period.

FREIGHT TRANSPORT: THE COMPETITION HAS THE LEAD

At the ifa trade fair 2025 in Münster, a representative of the Italian Association of Railway Engineers (CIFI) presented a table listing 20 smaller railway lines in addition to the main state-owned RFI network. According to ERA 2025, 12 Italian passenger transport companies and 7 Italian companies licensed for passenger and freight transport operated on these lines. In addition, 21 foreign railway companies held a safety certificate for passenger transport and 9 held licenses for passenger and freight transport. **Nevertheless, Trenitalia retained the largest**

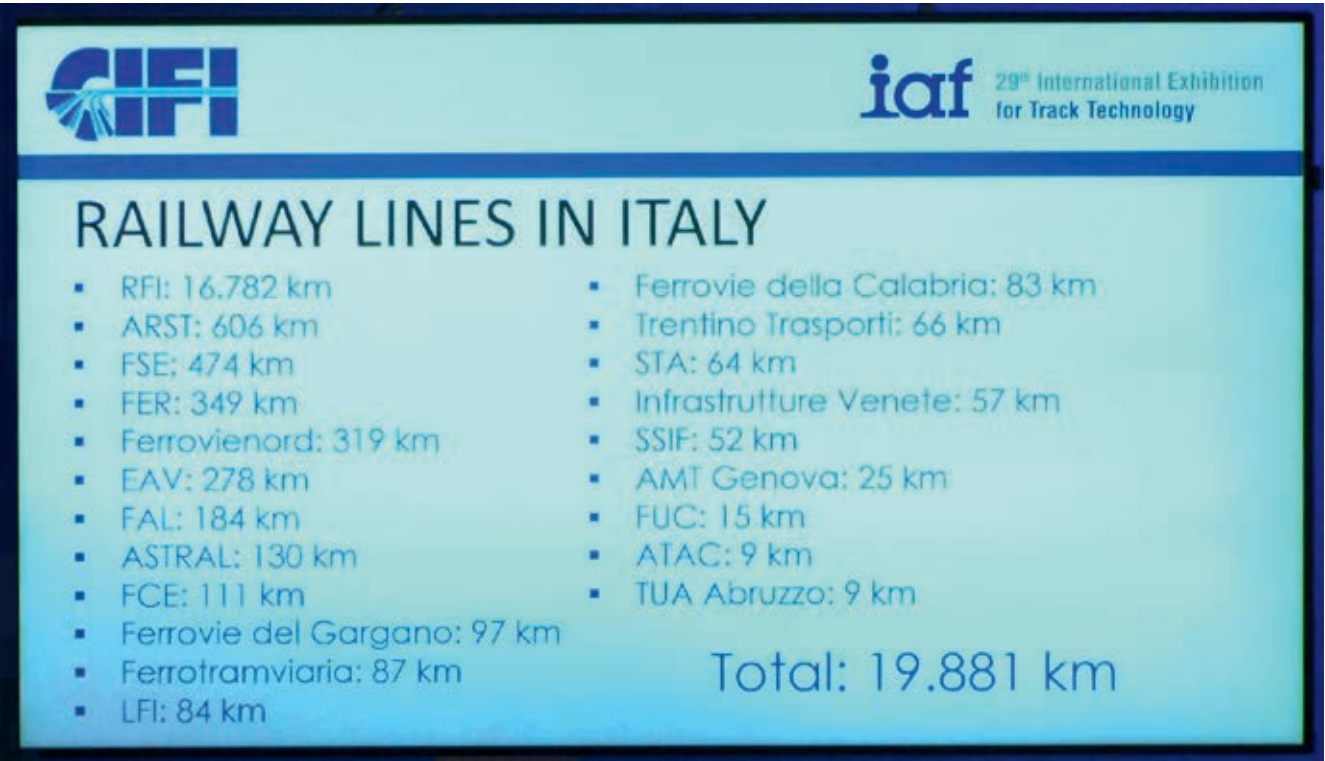
market share of Italian passenger rail transport with 87.7 percent. The situation is quite different in rail freight transport – according to ERA 2023, the FS Group only had a 41 percent market share. Domestic competitors had a 38.7% market share and foreign competitors a 20.2% share.

For 2025, the ERA listed 23 Italian freight-only companies and 46 foreign freight-only companies with the necessary safety certification. Mercitalia's main competitors in rail freight transport are Medway Italia, InRail, Captrain Italia, GTS Rail, DB Cargo Italia, CFI, and BLS Cargo Italia. It is therefore not surprising that Mercitalia is also looking abroad for additional business opportunities and thus sources of revenue. At the end of April 2018, the Italian Council of Ministers approved a proposal to merge FS Italiane with the national road operating company Anas, which manages 25,000 km of state roads and motorways. For this purpose, FS carried out a capital increase, increasing its value from the previous €38 billion by approximately €2 billion from the Anas shares.

Hermann Schmidtendorf

In addition to the state railway network, there are also a number of smaller non-state railway lines.

Oltre alla rete ferroviaria statale, esistono anche diverse linee ferroviarie minori non statali.



Sabotage, new routes, new trains:

THING REMAINS EXCITING ON ITALY'S RAILWAY TRACKS

In mid-January 2025, Italian Minister for Relations with Parliament, Luca Ciriani, commented on the punctuality of train services. In November 2024, the railway company Trenitalia stated that **the average delay on medium- and long-distance routes in 2023 was just under nine minutes**. That's not much – but it adds up. Therefore, according to the minister, only **74 percent of the fast Freccie trains were on time. For intercity trains, punctuality was 82.6 percent, and for regional services, 88.9 percent. The reasons for the delays are 25 percent due to the rolling stock and 34 percent to the infrastructure.**

FLUCTUATING PUNCTUALITY, 1,200 CONSTRUCTION SITES

Therefore, there must be a lot of construction,

repair, and modernisation. There are currently around 1,200 construction sites in the Italian rail network, reports the infrastructure company. Many projects will take several years to complete. This sometimes pushes the system to its limits. The result can be frustrating for travelers. In January 2025, hundreds of trains had to be canceled due to a technical problem with an overhead line in the Milan area. Tens of thousands of passengers were stranded at stations. Transport Minister Matteo Salvini spoke of sabotage. In a public announcement, the state railways complained of repeated acts of sabotage at hubs of the Italian rail network, often during peak times of day.

Are radical left-wing groups trying to force the transport minister to resign? Not all Italians are convinced by this interpretation. In any case, ►

the state railways announced plans to increase surveillance within stations and at hubs of the rail network, install more video surveillance cameras, and increase the presence of technicians to intervene "in a timely manner" in the event of problems.

In mid-May 2025, the infrastructure company RFI also awarded two contracts with a total value of over €3.7 billion for the construction of additional high-speed lines. The contractor is a consortium consisting of Webuild, Ghella, and Impresa Pizzarotti. The first contract involves the construction of a section of the high-speed line along the Salerno-Reggio Calabria axis between Battipaglia and Romagnano. The maximum speed there will be 300 km/h. The 34 kilometres of railway line include the construction of approximately 14 kilometres of tunnels and more than six kilometers of viaducts. A junction in Romagnano will connect the new line to the existing network from Battipaglia to Metaponto and Potenza. The second contract involves the construction of a 47-kilometre section between Lercara and Caltanissetta Xirbi in Sicily for the railway line between Palermo and Catania. This includes the construction of more than 22 kilometres of tunnels.

NEW FRECCIAROSSA TO ALSO SERVE 7 EU COUNTRIES

Since June 2015, Italy's most modern high-speed trains have been the Frecciarossa 1000 (ETR 400). These trains offer four carriage classes: Executive, Business, Premium, and Standard, as well as a bar and restaurant car. They were developed and manufactured by an Italian consortium consisting of AnsaldoBreda and Bombardier. In 2015, AnsaldoBreda was acquired by Hitachi and became Hitachi Rail Italia. As a condition of the Bombardier acquisition, Alstom had to comply with the EU requirement to transfer the Frecciarossa platform ("V300 Zefiro") to a competitor in 2021. **Hitachi Rail Italia is now also the supplier of the latest Frecciarossa 1000 trains (ETR 410).**

On September 28, 2025, FS Group CEO Stefano Antonio Donnarumma officially put the first new-generation Frecciarossa 1000 into service,



The new Frecciarossa during the presentation in Rome by the CEO of the FS Group.

Il nuovo Frecciarossa durante la presentazione a Roma da parte dell'Amministratore Delegato del Gruppo FS.

with a maiden run on the Rome–Naples route. Thirty-six trains have been ordered, with an option for ten more. Between eight and ten trains per year are to be delivered by 2029. Starting in December 2026, these trains will also connect Rome and Milan with Munich daily. Starting in December 2028, Trenitalia also plans to operate between Naples and Rome, Munich, and Berlin. For CEO Donnarumma, the introduction of the new Frecciarossa 1000 is **a key step in the company's 2025–2029 strategic plan. This includes fleet renewal and structural changes. A new Italian subsidiary is currently being prepared. This will manage the up to 2,000 kilometres of high-speed lines itself.**

The new trains incorporate significant technological improvements. These include an improved propulsion system, a full Ethernet 100 Mbps control system, and a certified energy measurement system for more precise billing of electricity consumption. Wi-Fi capacity has been increased tenfold for passengers. The new air conditioning system reduces the global warming potential by 56 percent compared to the previous component. Energy consumption is significantly lower. **The old generation of Frecciarossa trains received approval for operation in France in 2021. The new trains will also be available for Germany, Austria, Switzerland, the Netherlands and Belgium.**

Hermann Schmidtendorf



FS LOGISTIX:

THE FUTURE OF MERCITALIA IS DIGITAL

Good news for all freight train operators in Italy: Since October 25, 2025, the Ministry of Transport has allowed locomotives to be driven by only one person. Until then, two people were always required in the driver's cab in case one of them became ill. This rule was previously considered anachronistic in other European countries and was abolished. After all, modern safety and braking systems are now available in locomotives. A second person makes freight transport unnecessarily expensive, and there is already a shortage of staff.

May 2025 was also a happy year for the state-owned freight company Mercitalia Rail. For the first time since its founding, it was able to regain market share – from 38% at the end of 2024 to 38.8% after the first half of 2025. Mercitalia Rail was created in January 2017 when the cargo division was spun off from the Italian state railway in accordance with EU regulations. The group includes seven companies, of which Mercitalia Logistics acts as an intermediate holding company. In Germany, the Mercitalia Group founded its foreign subsidiary, TX Logistik AG. In June 2023, it acquired Exploris Deutschland Holding GmbH, based in Hamburg, becoming the second-largest rail transport company

in Germany. The Exploris Holding companies also include Via Cargo, HSL Logistik, and Delta Rail, which are active in rail freight transport in eight European countries.

A new step followed in Rome on June 2, 2025. The FS Group's logistics operations will now be consolidated under the FS Logistix brand. The center of its activities will be a new, integrated digital platform for end-to-end freight transport: fslogistix.com. FS Logistix aims to become a European freight forwarder for all logistics players, "covering the entire value chain and integrating the best Italian and European expertise," it says. The rolling stock renewal will involve the purchase of 110 electric locomotives, 25 shunting locomotives, 2,000 new-generation wagons, and a "green" vessel for ferry crossings in the Strait of Messina.

These investments include the first two Traxx Universal electric locomotives of the 2025 series, which manufacturer Alstom delivered to Mercitalia Rail in May 2025. Seventy electric locomotives are to be delivered by 2027, with an option for 30 more. Some of these high-tech locomotives will be equipped with last-mile technology. The new locomotives complement the 60 Traxx Universal locomotives already in use by Mercitalia Rail. The four-axle Traxx Universal was specifically developed for freight transport and, according to Alstom, is characterized by efficient power consumption and high traction capacity.

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Traxx universal locomotives for FS Logistix at the Alstom plant in Vado Ligure.

Locomotive universali Traxx per FS Logistix presso lo stabilimento Alstom di Vado Ligure.



Credits: Alstom

ALSTOM ITALIA:

GOOD INVESTMENTS, GOOD CONTRACTS

Rail manufacturer Alstom operates at nine locations in Italy. Its investment plan for Italy envisages expenditures of €63 million from 2024 to 2026. Key projects include:

- **Savigliano:** Expansion for testing hydrogen trains and Avelia Stream 300 trains, as well as new production lines for regional trains
- **Vado Ligure:** Expansion for maintenance of regional trains
- **Nola:** Construction of a paint booth for high-speed trains
- **Bologna:** Renovation of office space
- **Development of solar parks at several Italian locations**



The new ALSTOM plant in Valmadrera.

Il nuovo stabilimento ALSTOM di Valmadrera.

Credits: Alstom

In March 2023, Alstom opened a new production facility in Valmadrera. The site covers 9,800 square metres, including 1,300 square metres of storage space. New CNC machines, a testing machine for quality laboratories, and automated storage systems were installed for two million euros. The site will produce electrification equipment for the Italian and international mar-

kets. This includes overhead line booms for the electrification of railway lines, terminal blocks for substations and power distribution lines, rigid overhead lines for subways, conductor rails and APS rails for subway and tram lines, and power supply cables for overhead cranes. Michele Viale, Managing Director of Alstom in Italy, points out that these "unique products" have contributed to the construction of "some of the most important subway and tram lines," for example in Istanbul, Riyadh, Paris, and London (Elizabeth Line).

The company has committed to developing 100% of new solutions with environmental considerations in mind by 2025, and to generating 100% of its electricity from renewable sources. In its first Impact Report, Alstom Italia highlights the company's significant contribution to the Italian economy. This includes €1.019 billion contributed to Italy's GDP, supporting 14,087 jobs (including direct, indirect, and induced employment), and a network of 1,517 Italian suppliers who purchase goods and services valued at €829 million.

Important recent contracts include a framework agreement with Rete Ferroviaria Italiana (RFI) for the development, supply, and commissioning of an ERTMS monitoring and control system in central and southern Italy. This will equip 1,400 kilometres of Italian railway lines. In 2024, Ferrovie del Sud Est (FSE) in Puglia ordered two Coradia Stream H hydrogen trains. Ferrovie Nord Milano (FNM) has also ordered two Coradia Stream H trains. These will complement the six hydrogen trains already ordered for the region under a 2020 framework agreement for up to 14 hydrogen multiple units. The Coradia Stream H trains are based on Alstom's single-deck Coradia Stream regional train platform and will be manufactured by Alstom in Italy.

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Credits (2): PESA

A PESA ATR 220 train near the medieval Ponte della Maddalena bridge in Tuscany.
Un treno PESA ATR 220 vicino al Ponte medievale della Maddalena in Toscana.

PESA Bydgoszcz:

POLISH MULTIPLE UNITS ON ITALY'S REGIONAL LINES

Poland's leading railway manufacturer, PESA, also operates rolling stock in Italy. In 2006, the regional Italian railway company Ferrovie del Sud Est (FSE) ordered 13 three-car diesel multiple units for regional passenger transport in Apulia. This was the first export contract in PESA's history, which later also delivered to Germany, the Czech Republic, Ukraine, and Lithuania, among others.

FSE ordered another ten trains in 2007 and another four in 2010. **Between 2008 and 2021, PESA delivered 99 Polish Class 219M Atribo multiple units to Italy. They were derived from the Polish Class SA136. In Italy, they were classified as the ATR 220 series or (the second major delivery) the ATR 220Tr series. They are used for regional transport, primarily in the regions of Emilia-Romagna, Milan, Piedmont, Sardinia, Lombardy, and Apulia. They are operated directly or indirectly by the**

state railway company Trenitalia.
An exception is the private railway company Arenaways, which has been jointly owned by the Spanish state railway company Renfe since January 2025. Arenaways was commissioned by the Piedmont region to operate passenger services on the Savigliano-Saluzzo-Cuneo and Ceva-Ormea lines until the end of 2032. Arenaways uses four leased ATR220s for this purpose. The lines served are two of twelve branch lines in Piedmont whose service ►



An ATR 220 train in the PESA workshop.
Un treno ATR 220 nell'officina PESA.

was discontinued in 2012. Trenitalia reactivated two other lines from this list in September 2024.
The ATR 220 is equipped with a modern diesel engine that meets the latest Stage IIIB emissions standards and a hydrodynamic transmission that ensures smooth and dynamic ride. The vehicles feature modern design and color schemes, as well as an inviting interior with comfortable seats, air conditioning, a dynamic passenger information system, Wi-Fi, and surveillance. hfs

An advertisement for evr (European Vision Rail) featuring three diverse people (two women and one man) smiling and looking at a laptop. The background is a blurred office setting.

evr

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ÖBB RAIL CARGO GROUP STRENGTHENS POSITION IN ITALY

The ÖBB Rail Cargo Group (RCG) is one of the competitors in Italian rail freight transport and is continuing to expand its presence in the transport market. At the end of July 2025, RCG signed a ten-year contract with the Sona terminal near Verona. This ensures close cooperation – RCG will become one of the terminal's main partners and secure important capacity at an early stage at a fast-growing logistics hub.

In the coming years, RCG plans to further expand its transport operations and contribute to the modal shift from road to the more environmentally friendly rail. The Sona terminal is already well-equipped. It has two entry and exit tracks and four loading tracks, each 600

meters long, for loading and unloading freight trains. With a total area of approximately 110,000 square metres, the site offers sufficient space for all intermodal logistics processes, such as container transfer from train to truck or vice versa. A significant expansion ►

*Always on the move: an ÖBB-RCG TransFER train on the Italy – Brenner route.
Sempre in movimento: un treno TransFER ÖBB-RCG sulla tratta Italia – Brennero.*



Credits: ÖBB-RCG/Knopp



Credits: ÖBB/Playr

*Many trains also go from the ÖBB loading terminal Vienna-South to the Sona/Verona terminal.
Molti treni partono anche dal terminal di carico ÖBB Vienna-Sud e arrivano al terminal Sona/Verona. ÖBB Rail Cargo Group (RCG) ha firmato un contratto decennale con il terminal di Sona, vicino a Verona. RCG diventerà uno dei partner principali del terminal e si assicurerà fin da subito una capacità importante in un hub logistico in rapida crescita. Il terminal di Sona è già ben attrezzato. Dispone di due binari di entrata e uscita e quattro binari di carico, ciascuno lungo 600 metri, per il carico e lo scarico dei treni merci. Con una superficie totale di circa 110.000 metri quadrati, il sito offre spazio sufficiente per tutti i processi logistici intermodali, come il trasferimento dei container dal treno al camion o viceversa. È previsto un significativo ampliamento della capacità entro il 2028. Il terminal sarà trasformato in un importante centro di distribuzione.*

of capacity is planned by 2028, with additional regular train connections coming as early as 2026.

The terminal is to be developed into a major distribution center. Projects are already being prepared that will enable new connections and increased transport via Sona. Through this strategic cooperation, the Sona site is intended to establish itself as an intermodal hub for the transport of goods to and from Southern, Northern, and Eastern Europe, thus facilitating seamless collaboration between the various modes of transport. Up to 30 train connections per week can already depart from here – efficient and sustainable by rail. Around 30 employees on site ensure smooth operations.

Direct TransFER connections via Verona RCG offers regular connections with fixed timetables under the TransFER label. The Sona terminal near Verona is already integrated into several RCG TransFER

connections. These include the following regular, direct train connections for freight transport by 2025:

- **TransFER Vienna–Verona:**
Twice a week in both directions.
- **TransFER Verona–Hanover:**
Four times a week in both directions.
- **TransFER Verona–Wuppertal:**
Eight times a week in both directions.

These connections from Italy to Germany help avoid truck journeys on the heavily congested Brenner Pass. They thus contribute to relieving Tyrol of transit traffic. With this new partnership, RCG is investing specifically in modern, high-performance infrastructure for international rail freight transport. This not only strengthens its own market position but also brings sustainable benefits to customers in international freight transport.

hfs/rg

H&S Getriebeservice in Duisburg/Germany:

PRECISION WORK ON HEAVY OBJECTS

A conversation with the managing directors of H&S Getriebeservice GmbH, Pascal Delfs (left) and Michael Dieterich.

The company was founded in 1992 by Mr. Hirschmann and Mr. Stumpp – hence the name H&S. Both men worked for the world-renowned transmission manufacturer Voith for many years and completed their training there. At H&S, both men established a final drive workshop alongside the Voith fluid transmission department. They immediately ensured that there was no limitation to a single type. Therefore, they also carried out overhauls of final drives from manufacturers such as Deutz, Henschel, MAK, and ZF.

Another advantage: Not only the fluid transmissions were reconditioned, but also the rear-mounted reversing transmissions for older locomotives. Spare parts are always a top priority – especially when the manufacturers no longer exist. But we're now so well connected that we can also manufacture components. We're also very well connected in the rolling bearings sector. We have suitable partners ►



A conversation with the managing directors of H&S Getriebeservice GmbH, Pascal Delfs (left) and Michael Dieterich.
Conversazione con gli amministratori delegati di H&S Gearservice GmbH, Pascal Delfs (a sinistra) e Michael Dieterich.



Credits: H+S/Hermann Schmidtdorf

there, three suppliers with whom we work very well and who fully support us. Our work and the parts we install are "Made in Germany" or "Made in Europe." We only install bearings from European brand manufacturers anyway, not cheap products from the Far East. We are ISO 9001 certified, have quality assurance, and now even have a second workshop.

Knowledge transfer is extremely important. We've started to combine the teams into a combination of an older and a younger employee. This is beneficial for both. The younger employee learns from the older one, and the older one may no longer have to crawl deep into the locomotive and remove the components themselves during assembly. This way, the new employee gets training, and the older employee is physically less stressed.

We've optimised our factory processes and always have a good flow rate. Nevertheless, such work is complex, so we are often fully booked in the turbo transmission department a year and a half in advance. And the order book in the wheelset department is also well filled. We're talking about a volume of 95 wheelsets and around 40 transmissions that are always in the order book. But it's no different for other service companies – there are only

a few specialist workshops for this kind of work in Europe! That's why we operate throughout Europe. We have customers not only in Germany, but also in Sweden, Denmark, Switzerland, Austria, Italy, as well as in France.

Pascal Delfs and Michael Dieterich,
Managing directors H&S.
info@hs-getriebeservice.de

ABSTRACTS

In Europa ci sono ancora molte locomotive diesel, ma poche officine specializzate nella riparazione di trasmissioni turbo con pre-cambio e trasmissioni secondarie. Una di queste officine specializzate è "H+S Getriebeservice" di Duisburg, in Germania. Riparano e revisionano anche sale montate complete. I clienti si trovano in Germania, Svezia, Danimarca, Austria, Svizzera e Francia.



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