keep track

2020

THE RHOMBERG SERSA RAIL GROUP CUSTOMER MAGAZINE

Highlights in this edition

RHOMBERG SERSA RAIL GROUP

THREE WEDDINGS – ONE DANCE!

At Rhomberg Sersa Rail Group, we focus consistently and constantly on three main areas: technology, customers and our employees. However, this focus has led us to ask multiple times: do these work together? It's time to answer this question: they do!

As our **customers**, you are our motivation and should feel that we treat you like royalty. We make your challenges our own: our aim is to constantly increase the efficiency of the high-quality services you can expect from us, while guaranteeing the highest level of safety. To achieve this, we primarily use **technology**, whether digital or mechanical. We are continuously developing these, because this is the only way we can carry out our work efficiently and safely, at the same time inspiring you.
But who is constantly developing the technology? Who inspires our customers – you – on the construction site and on location? Our employees, of course. They are our most important asset. Day in, day out, they deliver top services on time and in outstanding quality under sometimes difficult conditions, therefore ensuring your satisfaction. For certain! Every day, they use their experience, their responsibility and their commitment to become even better.

As you can see, we focus on the close interaction between customers and technologies, supported by our **employees**. We are 100 percent convinced that these are and will continue to be the right distinguishing features. Of course, there will always be suppliers who try to undercut our prices, but thanks to our quality, intelligence, reliability and fully motivated employees, we are very relaxed about this 'competition'. This is because our approach of permanently developing the issues of sustainability and efficiency will prevail. To the clear advantage of our customers!

Konrad Schnyder
President Owner Board
Rhomberg Sersa Rail Group

Hubert Rhomberg
Member Owner Board
Rhomberg Sersa Rail Group

TAKE THE LEAD

Maximising customer benefits: Rhomberg Sersa starts a comprehensive development programme for its own employees.

Leadership is not a function of the organisation or position – leadership is distributed across all members of the organisation." Ed Schein, Organisational Psychology.

In every one of our construction projects, the faster the right decisions are made on location, the faster and better the implementation. In order to make the right decisions, clear guidelines are needed in addition to experience and expertise. Values such as trust, teamwork, respect, excellence, integrity and safety guide our actions and enable us to achieve the best possible results for our customers. And, more importantly, daily application is needed to fill our values with life. This creates a number of challenges for our employees. But, and this applies above all to our clients, it also brings many opportunities!
Therefore, at the beginning of the year, the Rhomberg Sersa Rail Group launched a programme in which all managers in the Group – and also all those who want to take on responsibility now and in the future – are comprehensively promoted and supported in their personnel development: the Leadership Academy.

"THIS IS HOW WE TURN RSRG LEADERSHIP INTO A COMPETITIVE ADVANTAGE, ATTRACT NEW TALENT AND CREATE A CULTURE OF TRUST AND LEARNING..."

Thomas Bachhofner
CEO Rhomberg Sersa Rail Group

After all, according to the understanding of RSRG, managers have the most important key role of all: they embody and exemplify the values and philosophy of the group. They foster and challenge each and every one of their employees individually according to their abilities and needs. This applies to the decision-makers at the top level of group management and those responsible for the markets, as well as the managing director, overall project managers, team and project managers, construction managers, foremen and group leaders. And it affects every employee who, within the scope of their responsibility, makes decisions on a daily basis, works together with customers and suppliers and therefore represents, lives and demands our corporate values.

However, the needs and challenges of and for managers are constantly changing, so even the most experienced leaders must continuously develop themselves. "The ability to carry out the wealth of tasks and responsibility with confidence requires more than the professional skills that are abundantly available in our companies," explains CEO Thomas Bachhofner. "A leader must be an organiser and coordinator as well as an activator, facilitator and last but not least, communicator and motivator..." And the Leadership Academy is designed to help the Group's employees develop precisely in this way: "This is how we turn RSRG leadership into a competitive advantage, attract new talent and create a culture of trust and learning," explains Bachhofner.

THOMAS MAYER BECOMES NEW CFO

Management change at Rhomberg Sersa Rail Group

Since April, Thomas Mayer has been the new CFO of Rhomberg Sersa Rail Group. He brings extensive expertise in the establishment and development of group-wide financial processes and functions and, among other issues, has in-depth experience in 'Mergers & Acquisitions' – "all skills which make him the perfect fit for his tasks in our group", as Thomas Bachhofner, CEO of Rhomberg Sersa, points out. "His skills and knowledge will provide us with optimum support in maintaining and expanding the technological leadership of our industry." Even before joining the Swiss-Austrian railway engineering group, Thomas Mayer spent many years in the management of international family businesses, including 13 years as CFO.

Thomas Mayer, CFO Rhomberg Sersa Rail Group

OUR WINNING PAIR: HUMAN AND MACHINE

A machine has many advantages over humans. It can carry out monotonous work without signs of fatigue and always with the same quality. It is adaptable and virtually indestructible. But humans can do a number of things better than machines. They have knowledge, leadership, empathy and creativity. Which is why ‘human or machine’ is not a debate for Rhomberg Sersa. We believe in ‘human and machine’.

As a company whose clients often have an enormous responsibility to the taxpayer, it is particularly important to us to continuously improve the efficiency of our services. In doing so, it is essential to strictly adhere to applicable rules, laws and safety measures. This is not possible without the continuous development of our technologies and machines. At Rhomberg Sersa Rail Group, this is carried out exclusively by responsible employees who, thanks to their experience and ideas, get the best out of their ‘colleagues on wheels’. To achieve this, we as a company invest a lot of time and money compared to others.

Another tool is better and more proactive planning. Processes also have to be simulated with many eventualities and often run through before they can be implemented. Here we see digitisation as an optimal support and apply digital technologies that we have developed in more and more projects for the benefit of our customers. Especially for areas such as the railway industry, where errors are practically forbidden and it is, therefore, very difficult to apply innovations quickly.

Our aim is to create the optimum conditions for the best employees so that there are as few humans as possible in hazardous areas on construction sites, to reduce or even avoid idle and waiting times, and therefore to be able to build safely, to a high standard of quality, according to plan and efficiently, even under difficult logistical conditions – such as in tunnels, in the middle of cities or in mountainous terrain. And it goes without saying that our rail-bound machines should be kept in the best possible condition at all times. For this, we need technology and excellently equipped workshops.

All this shows humans profit immensely from machines, machines are nothing without humans.

EXPECT THE UNEXPECTED

How Rhomberg Sersa Rail Group is not letting COVID-19 throw it off track.

REPARATION IS THE KEY TO SUCCESS WE PAY HEED TO THIS WISE SAYING IN EVERY SINGLE PROJECT THAT WE TACKLE FOR AND WITH OUR CUSTOMERS. AND THOUGHOUT OUR COMPANY AS A WHOLE. WITH CLEAR STRUCTURES AND TOOLS SUCH AS CRISIS GUIDELINES, WE HAVE GIVEN RSRG A STRUCTURE IN OUR BRANDS IN WHICH WE HAVE THE RIGHT ANSWER FOR EVERY CHALLENGE, NO MATTER HOW SURPRISING. IN THE PAST FEW MONTHS, WHEN A SMALL VIRUS BROUGHT ALMOST THE WHOLE WORLD TO A STANDSTILL WITHIN A VERY SHORT TIME, WE WERE ABLE TO PROVE THIS. FOUR EXAMPLES:

SWITZERLAND, HORGEN

The renewal of the three 900 switches with substructure renovation at Horgen Station was scheduled to start on 20 March, therefore practically at the same time as restrictions to prevent the spread of COVID-19 were implemented. But what can we say? It did! All those involved adapted the infrastructure and procedures with admirable speed: additional containers and water tanks were brought to the construction site, and new regulations regarding arrival and departure were introduced. Rotas were rearranged so that all employees were as safe as possible and, at the same time, replacements could be guaranteed for colleagues who might need to be quarantined. There was also a COVID-19 representative on location.

This, as well as the activities of all other Sersa construction sites in Switzerland, was coordinated by the COVID-19 Task Force, which was set up at short notice.

GERMANY, WENDLINGEN–ULM

The major project forming part of Stuttgart 21, the construction of the new line between Wendlingen and Ulm, also continued to run smoothly. Here, too, the foundation was laid by precise and comprehensive directives which were summarised and implemented in over 30 action guidelines within a few days and hours – for the construction office as well as for work directly on the tracks, for internal and external parties. "Visits to construction sites, which are often requested by interested parties for such a prestigious project, are currently still prohibited but the installation of slab track, for example, is progressing.

ENGLAND, KINGS CROSS

RSRG was also able to perfectly support its customers, in this case the Central Rail Systems Alliance (CRSA) and Network Rail, in the redevelopment of King's Cross Station in London, enabling them to continue on the construction site at an early stage. This was based on a thorough risk assessment of the activities, the use of the latest personal protective equipment (PPE), good cooperation with customers and partners in the supply chain for procuring materials, and the revision of the working agreements as part of an integrated programme. Stephen Kearns, Operations Director at Rhomberg Sersa UK: "Despite the COVID-19 pandemic, the RSUK infrastructure delivery team continues to deliver for our customers at King's Cross and it is great to see that the approved social distancing risk assessment is being effectively implemented; not an easy task when working in the tunnel."

AUSTRALIA, COOPERATION WITH ARTC

'Down under', the pandemic had practically led to the closure of rail transport in March and April. However, as Andrew Betts, General Manager Asset Management Hunter Valley at major customer ARTC confirms, the colleagues at Rhomberg Rail Australia did not just sit back: "Rhomberg Rail Australia supported ARTC during the shutdown period by implementing preventive measures to ensure the safety of our employees and our community while maintaining the level of service for our customers. Their ability to adapt to the changing situation, as well as their ability to offer alternative working methods, helped us to carry out the March/April shutdown safely and successfully."

Our customer ARTC manages and maintains a total of 8,500 kilometres of rail network carrying both people and freight, with the Hunter Valley Network supporting the world's largest coal exports. Rhomberg has been working with ARTC for many years and has developed strong relationships that provide the most cost effective, safe and reliable results for our community.

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ON LOCATION

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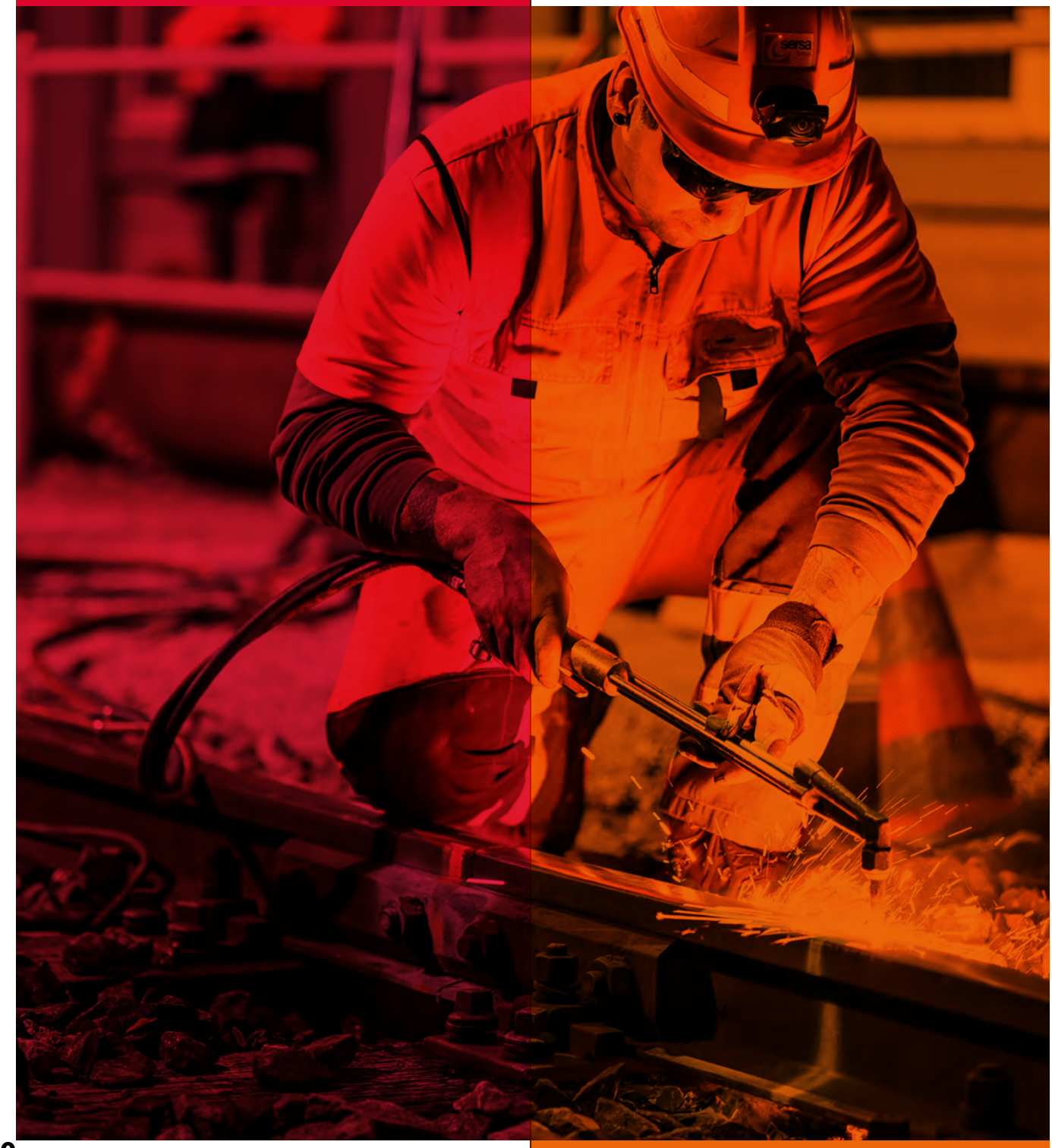
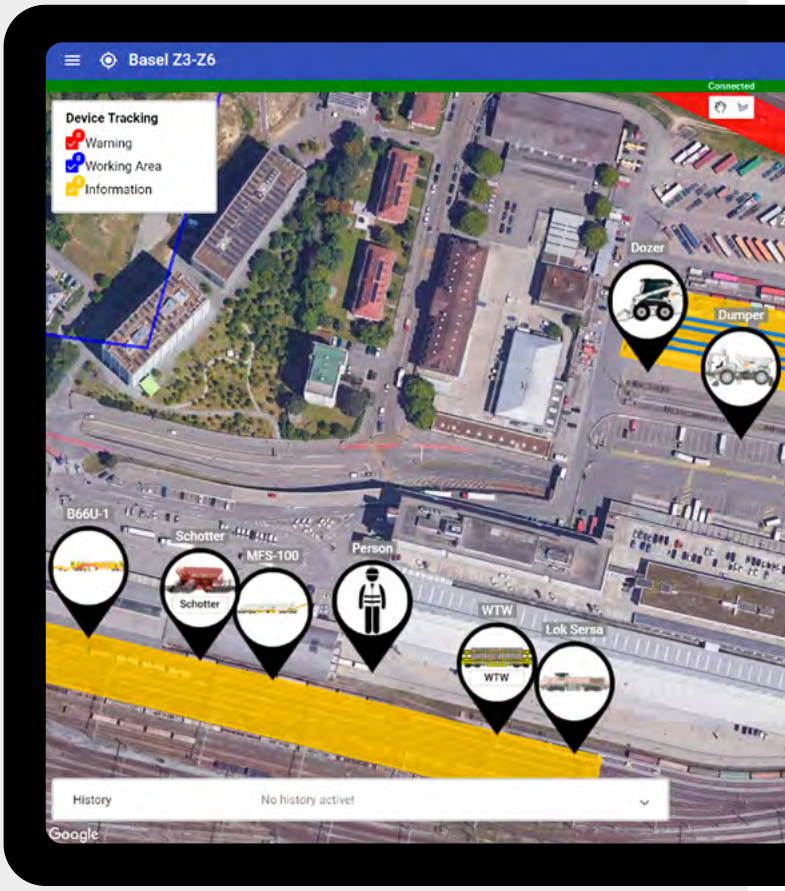
COMPANY NEWS



Elias Meusburger
RSRG

“INNOVATION IS AN IDEA IN ACTION.”



PRIZE

EXCELLENT IMPROVEMENTS

‘Owl’ wins the Prix Securité

FOR SWISS FEDERAL RAILWAYS, THE ‘OWL’ PRODUCT FROM RHOMBERG SERSA RAIL GROUP’S ‘SMART RAIL SAFETY’ INNOVATION PROJECT IS ‘THE BEST PERFORMANCE IN IMPROVING SAFETY’. THE REWARD: THE PRIX SÉCURITÉ 2020.

The aim of the innovation is to know exactly where all people and machinery are located on the construction site at all times. Since this knowledge creates an overview, errors are avoided and accidents are prevented. ‘Owl’ is a digital real-time representation of the construction site from a bird's eye view, which, thanks to eased communication and automatic logging, significantly simplifies and relieves workplace coordination. Using a smartphone app and GNSS tracker, the positions of construction crews and machinery are recorded and displayed as an overview. The web-based software application also facilitates direct and simultaneous communication with several people. Every user has access to the current construction site overview and messages can be answered on smartphones and smartwatches. All steps taken are automatically recorded in the running log. Potential danger zones can be set up virtually so that the system issues automatic messages. For example, the pivot range of the excavator: if an unauthorised person approaches, the person and the excavator driver receive a warning. This also applies to loading zones, crossings, assembly points and logistics routes as well as collision warnings between machines.

To increase safety awareness, identified hazardous situations and near misses can also be used for training. ‘Owl’ requires no installation effort and can be used at every outdoor construction site. The system enables workplace coordinators to focus on their core jobs and serves as a supportive, innovative tool that is used to facilitate coordination and operational activities on and around the track. The greatest added value on construction sites is the real-time overview and zone information as well as its automatic logging.

Elias Meusburger, Project Manager Technical Innovation/Agile Product Development at RSRG: “With our clear focus on the customer and our agile approach, we have successfully come up with an innovative product that also appeals strongly to other SBB service providers. The award shows that we are on a successful path with our innovations within RSRG and that it pays to invest in new things.”

ELECT RIFIED

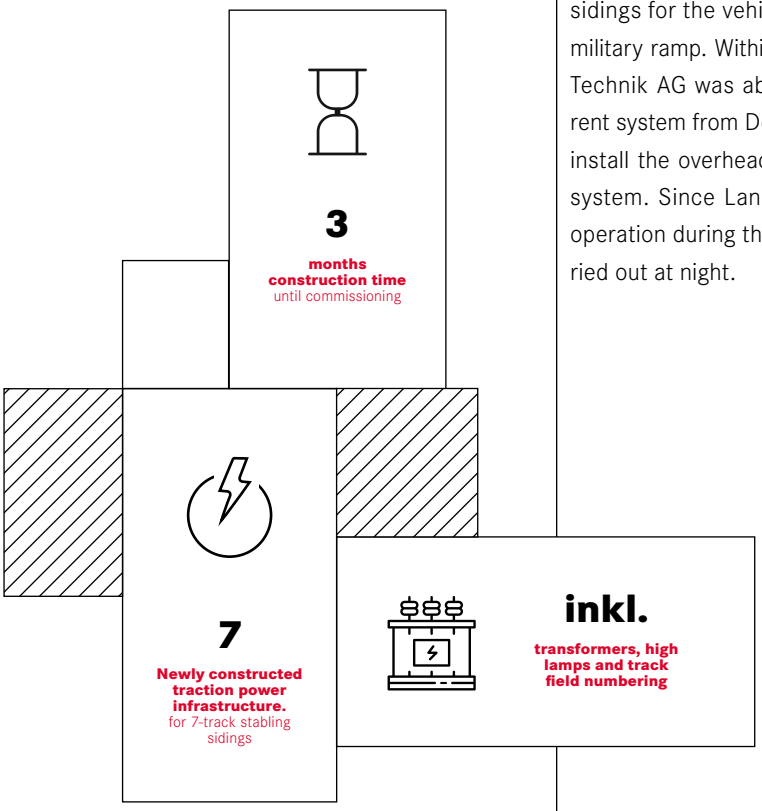
Sersa Technik creates new traction current system at Landquart Station

RHAETIAN RAILWAY (RHB) COMMISSIONED SERSA TECHNIK AG WITH IMPLEMENTING THE ENTIRE TRACTION CURRENT SYSTEM FOR THE NEW STABLING SIDINGS.

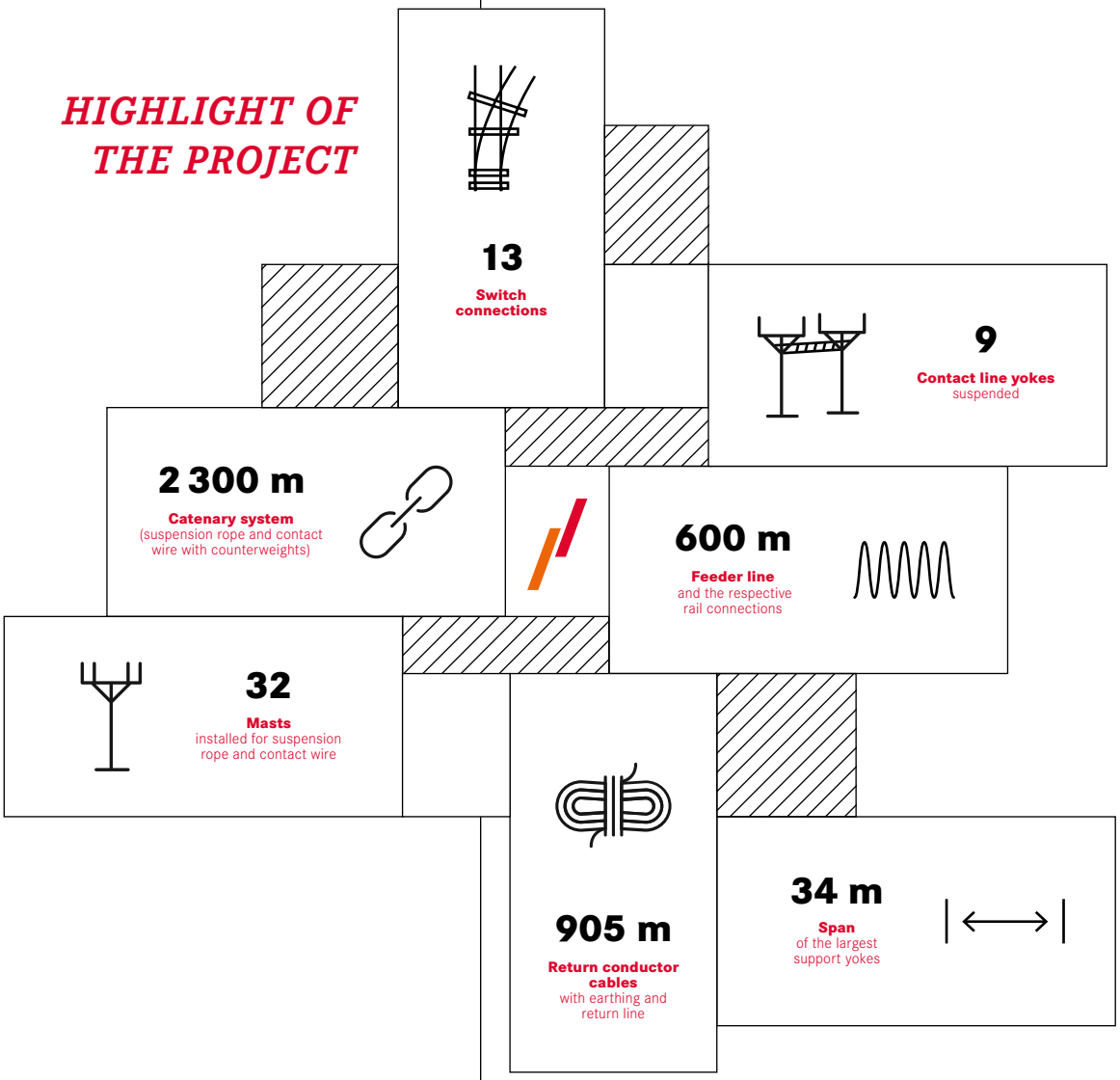
NEWLY CONSTRUCTED TRACTION POWER INFRASTRUCTURE.

In recent years, the RhB has invested heavily in the renewal of its fleet and infrastructure facilities as part of a large-scale modernisation phase. As a result, the existing workshops and stabling facilities in Landquart had to be adapted to new rolling stock.

As part of the major 'Renewal and conversion of the station' project, RhB also built new stabling sidings for the vehicles on the former site of the old military ramp. Within the scope of this project, Sersa Technik AG was able to build the new traction current system from December 2019 to March 2020 and install the overhead line connections to the existing system. Since Landquart Station had to be kept in operation during the day, a lot of work had to be carried out at night.



HIGHLIGHT OF THE PROJECT



The project comprised the new construction of the traction current system in the 7-track stabling sidings with overhead contact lines, transformers for the train pre-heating system, high lamps and track field numbering. The installation of the largest support yokes J 130 over a span of 34 metres at the RhB was the highlight of the project. The order comprised 2,300 metres of catenary system (suspension rope and contact wire with counterweights) and 13 switch connections. The catenary system – suspension rope and contact wire – was suspended from the cantilever of the 32 masts and 9 contact line yokes. This included 905 metres of return conductor cables with earthing and return line, rail connections and

Martin Kuhn
Electrical Systems

used an experienced RhB assembly team and tried and tested narrow-gauge machines. Among others, a brand-new Manitou ART 17 THM telescopic work platform was used.

After a three-month construction period, the catenary system of the new Landquart stabling sidings, including lighting, was handed over to RhB for operation on 13 March 2020 at around 3 a.m. and successfully accepted just one week later.

REINFORCEMENTS FOR AUSTRALIA

Rhomberg Rail Australia acquires RKR Engineering.

RHOMBERG RAIL AUSTRALIA HAS TAKEN OVER THE RAILWAY ENGINEERING COMPANY RKR ENGINEERING FROM EMU PLAINS, SYDNEY. WITH THE ACQUISITION, THE COMPANY HAS GROWN BY 30 HIGHLY SPECIALISED ENGINEERS, BOILERMAKERS AND WELDERS, THUS EXPANDING ITS CAPACITY IN THE AUSTRALIAN RAILWAY MARKET.

RKR Engineering is a direct supplier in railway construction focusing specifically on maintaining and renewing steel bridges as well as special engineering solutions for railways in Australia. Richard Morgan, Managing Director of the new Australian owner from the Rhomberg Sersa Rail Group, emphasises “With innovation and collaboration, RKR brings the philosophy that we stand for to life. Very successfully. I look forward to working closely with our new colleagues.”

Richard Morgan
Managing Director

2x 5T excavators work together with loaders to fill and pack the ballast before renewing the track.

ROCKHAMPTON BUSINESS

THE RHOMBERG RAIL AUSTRALIA TEAM IN GRACEMERE INTRODUCES ITSELF

From Gracemere near Rockhampton, Rhomberg Rail Australia's team of experts provides rail construction and maintenance services to the entire state of Queensland. The team supports a whole range of customers, including the network partner Aurizon.

Just recently, the railway construction professionals were on duty during the Blackwater closure. They completed work on the lateral displacement of the track at the Dingo level crossing, almost 150 kilometres west of Rockhampton, and renewed rails in the local marshalling yard. For the displacement, 100 metres of new track were laid, the asphalt at the crossing was dismantled and replaced and new overhead line masts were erected. In the station itself, 500 metres of track were replaced. The work was tough: the track in the station was built in the immediate vicinity of an inverted siphon, and the hilly and narrow surroundings of the construction site required a logistical masterpiece to get the sometimes very broad material loads on site.

Another exciting assignment was the total closure of the 'Goonyella' track in the Nebo and Dysart area of Queensland. The task here was to carry out two small but fine railway substructure renovations as the sole contractor. Rhomberg Rail Australia succeeded in renewing a total of 100 metres of track in just one shift, which saved the customer from lengthy complete closures.

ROLAND KUGLER
TIAGO FERNADES
RAMAZAN SÖNMENZ
JON MERZ

THE ‘SWITCH TEAM’

Rhomberg Sersa secures long-term framework agreement for the renewal of switches.

THE SWITCHLESS PROJECT, WHICH IS BASED ON A SOLE CONTRACTOR AGREEMENT, IS BEING IMPLEMENTED IN CLOSE COOPERATION WITH SWISS FEDERAL RAILWAYS.

This is the first framework agreement of Swiss Federal Railways (SBB) in the field of switch renewal and Rhomberg Sersa Rail Group has secured it: over the next three to five years, over 350 switches and sidings of the SBB network throughout Switzerland are to be renewed in over 100 individual projects. The contract covers the entire range of services from planning and ordering of materials, early coordination of timings with SBB, logistics and transport to execution and commissioning. The holistic, collaborative approach was without doubt one of the reasons for winning the contract. Therefore, the teams of the client and contractor as well as the planning offices see themselves as one unit, working closely together, jointly managing the project and driving it forward. They don’t call themselves the ‘Switch Team’ for nothing. On the other hand, the value-added chain in the entire life cycle of the overarching project and the sub-projects is aimed at generating the greatest possible benefit for the customer.

In the project launch phase in the first half of 2020, therefore, the aim was also to analyse SBB's internal processes for switch planning and work preparation and to identify room for improvements. The special form of cooperation in the ‘Switch Team’ made it possible to prioritise the project steps that are decisive for the actual creation of value – steps for the renewal of switches – and to align efficiency increases accordingly. In this dynamic cooperation, optimisations are also applied in practice using LEAN approaches.

The Rhomberg Sersa project organisation consists of an overall project manager and the project managers for planning and execution. In order to guarantee an optimum construction process in the long term, close contact is maintained to ensure that the experience gained from the execution is incorporated into the planning. With the integration of work preparation phases, those responsible can be efficiently prepared for the implementation projects, as the foremen and project managers involved are introduced to the sub-projects at an early stage and can contribute their experience.

SBB's aim of implementing infrastructure works using BIM methodology is also pursued in the Switchless framework agreement. The key applications are:

- **Scan2BIM:** Mobile mapping as the basis for (partially automated) inventory modelling before project planning and start of execution.
- **BIM2Field:** Machine control data is generated from the BIM model.
- **Field2BIM:** As-built data from the execution feeds the as-built model as the basis for operation and maintenance.

In this calendar year, the focus is on preparing for the implementation projects in 2021. Around 20 large switch renewal projects are planned, each with several switches. Alongside these intensive preparations, however, the first model projects have already been implemented – such as the renewal of 13 switches at the Basel marshalling yard which was launched in June this year. The project was successfully completed thanks to the great commitment of all those involved. The initial findings are now being integrated into the planning of the 2021 implementation projects with a view to continuous improvement.

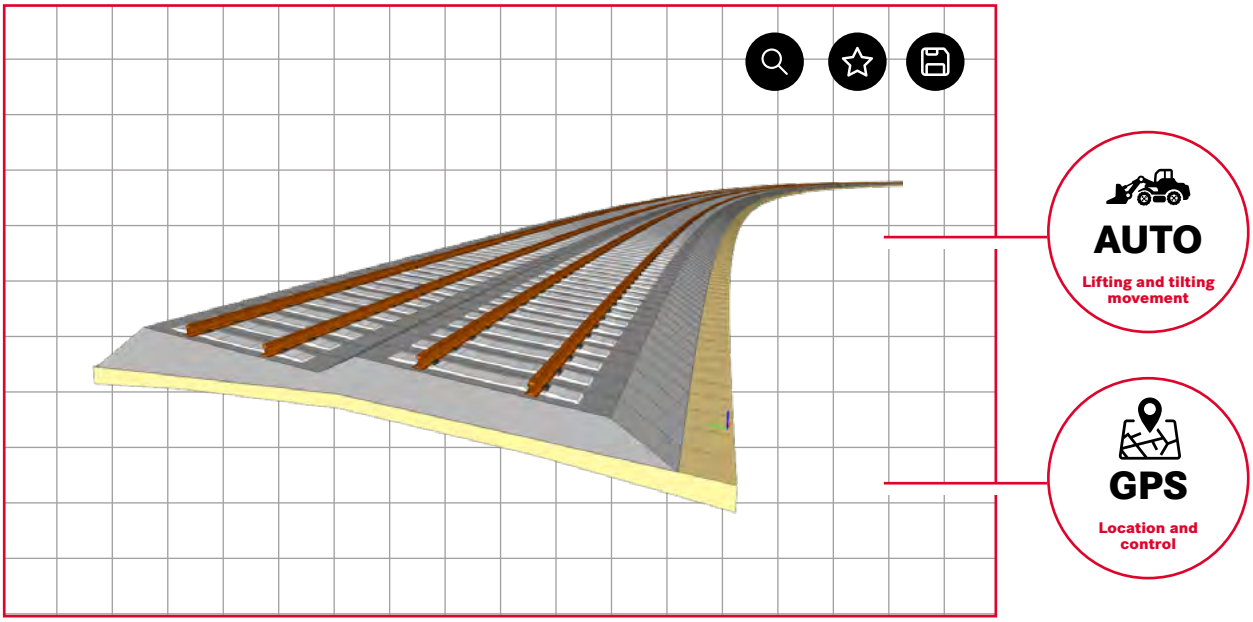
The 'Switch Team' is highly committed to planning and implementation and is therefore very confident that the sub-projects of the framework agreement can be completed with the experienced team components both on schedule and in perfect quality.

THOMAS ROTH
JUDITH ECKSTEIN
MARWIN VOSS
ANA LIMANI

PILOT PROJECT

FIRST DIGITAL MODELLING, THEN REAL BUILDING.

Reiner Morbach
Technical Branch Manager



RHOMBERG SERSA DEUTSCHLAND USES 3D MACHINE CONTROL FOR THE FIRST TIME.

The challenges of the 'Weidenthal-Hochspeyer and the opposite track formation protection layer' construction project were tough: the programme included the removal of 2,000m² of rock and the installation of approx. 1,000 tonnes of FPL and ballast, each within 88 hours.

To cope with these tasks, Rhomberg Sersa Deutschland used a bulldozer with 3D machine control system for the first time. The colleagues on location were supported by the RSRG internal BIM team which created a digital terrain model of the track section with all necessary details. A Cat D4K dozer with 3D ATS total station, which compares the received actual values with the target values of the terrain model in real time and therefore regulates with millimetre precision, was used for the implementation. The result: the client, DB Netz AG, received a first-class product within the specified time.

ONE YEAR IN BUSINESS

Plans for further growth in Ireland

THE YOUNGEST MEMBER OF THE RHOMBERG SERSA RAIL GROUP FAMILY CELEBRATES ITS FIRST BIRTHDAY WITH A SERIES OF MILESTONES.

Rhomberg Sersa Ireland (RSIE) was selected last year as preferred bidder for a 40 million contract to provide track maintenance services for the national rail network in Ireland. The contract covers the operation of 14 rail-bound machines of Iarnród Éireann/Irish Rail.

The company has achieved a number of notable successes in the first nine months of operations, including

- 1,280,945 tamped yards
- 1,095,410 yards regulated
- 27,485 yards cleaned

RSIE has also streamlined the ballast cleaning process to allow four-shift operation with ongoing maintenance. This has given the customer a significant improvement in cutting time during shifts.

Managing Director of RSIE, Billy Stamp, said: "Irish Rail is a fantastic client for us to work with. They are constantly striving to improve their service for the end user and we look forward to continuing our fruitful relationship," said Billy Stamp.

In the last year, the company hired a number of new employees and also began training new machine operator and technician apprentices. RSIE is training four apprentices in cooperation with Further Education & Training Authority SOLAS and Kildare County Council.

The contract runs for five years with an option for a further two years. The Irish Government is expected to provide funding for major infrastructure projects, including an underground line to Dublin Airport, in the near future.

3D MACHINE CONTROL AT RSRG

From virtual model to construction site and back. An exciting data journey from the office to the machine.

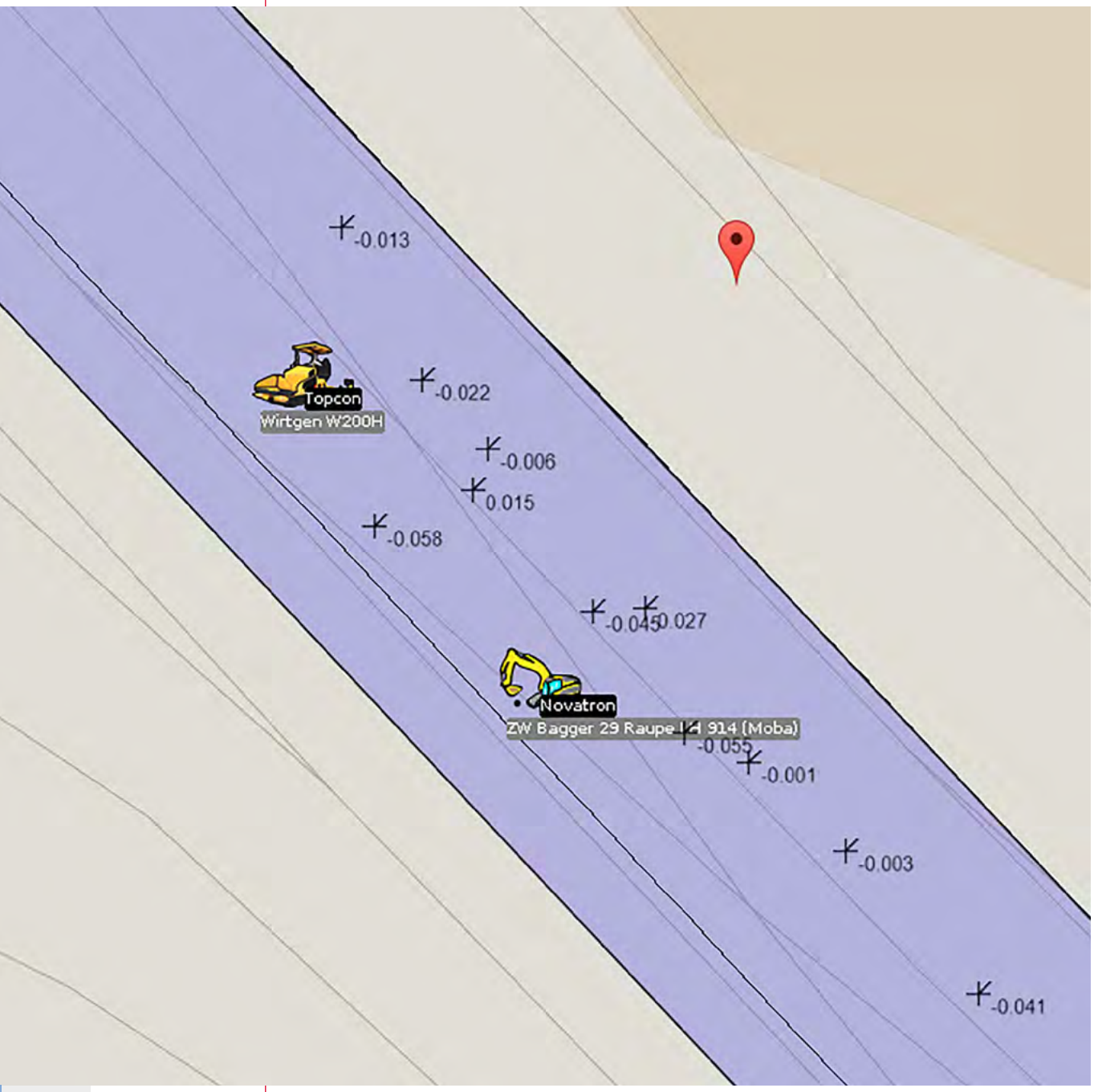
IN THE BIM IMPLEMENTATION PROJECT, RSRG SET ITSELF AMBITIOUS GOALS IN THE DIFFERENT FIELDS OF ACTION. MANY OF THESE INVOLVE LENGTHY AND INTENSIVE DEVELOPMENT WORK.

On the long road to their goals, the developers of the Rhomberg Sersa Rail Group repeatedly achieve intermediate results, which are already of direct use in their daily work and should therefore naturally reach their colleagues on the construction sites as quickly as possible.

One of these results is the preparation of machine data for the 3D machine control of excavators, bulldozers or milling machines. Processes for modelling virtual construction projects or targeted creation of e.g. excavation or pre-ballast levels, derived from track geometries, are already increasingly automated in the RSRG team. Transforming these levels into machine data for 3D control is just another possible use of the information already generated.

A web interface was set up to standardise the entire process, from the notification of project requirements and the generation of machine data to the provision for the machines and its use, and to automate it at a later stage. In the future, the foreman, for example, should register their requirements and be guided through the necessary information and data files in the input menu. These inputs are transferred together with the files into a process in which the desired machine data is generated and made available at the right place at the right time.

All machine and stakeout data required for a project can be managed and called up on a central construction site platform. This means that every system, whether 3D machine control of an excavator or rover rod for a stakeout, can use the processed



“FROM THE VIRTUAL WORLD TO THE CONSTRUCTION SITE AND BACK. THE PERFECT EXAMPLE OF DIGITALISATION IN CONSTRUCTION.”

data and return the data it has recorded to the system for construction documentation. Since all information is managed and processed via this central hub, specified/actual comparisons can also be made directly and displayed graphically in the system.

Marcel Nolte
Project Manager BIM

Andreas Grosse
Modeller BIM

SERVICE

COMPLETELY CONVINCING

Rhomberg Sersa Deutschland impressed the customer Romonta GmbH with a comprehensive range of services.

Christoph Schmoranzer
Site manager

THE RENEWAL OF TWO TRACKS AND TWO SWITCHES WITH A TOTAL OF 1010 METRES – THE ORDER FOR RHOMBERG SERSA DEUTSCHLAND (RSD) WAS NOT NECESSARILY A MAJOR PROJECT. BUT A SHOWCASE PROJECT: FROM PLANNING TO COMMISSIONING, THE RAILWAY TECHNOLOGY SPECIALISTS SUPPORTED AND IMPRESSED THEIR LONG-STANDING INDUSTRIAL CUSTOMER ROMONTA GMBH WITH A COMPREHENSIVE FULL SERVICE.

Romonta GmbH operates an open-cast mine in Mansfelder Land near Halle (Saale) and produces wax from the mined coal in addition to generating energy. Most of the products are transported by rail. For several years now, RSD has repeatedly been able to convince customers of its performance, expertise, public image and, last but not least, personal customer care in various track repairs. As a result, the professionals from Rhomberg Sersa were Romonta's first point of contact when they wanted to reactivate an old track system on the company's site. The plan was to use new strategies to create new capacities with rail-bound loading facilities.

"The first thing we did was sit down several times with those responsible on the customer side and develop various ideas and possibilities together for implementing the project," recalls Christoph Schmoranzer, Site Manager of Rhomberg Sersa in Halle. "In this way, we were finally able to offer Romonta a number of route options, all of which complied with the sustainability aspect and the regulatory requirements. After the order was placed, the service continued seamlessly. The railway construction specialists were also on hand to advise their customer on obtaining the regulatory approvals and took over all the track system planning, including recording the old stock and surveying the new track systems. Furthermore, the soil was examined for its bearing capacity and the track structure was adapted accordingly. The materialisation and organisation of the construction site was also the full responsibility of the service provider, whereby here the work was carried out explicitly as a result of a comparison of variants and considering the aspect of sustainability. During the implementation, which was of course also the responsibility of RSD, the focus was on the consideration of Romonta GmbH's operational workflows and rail transport. Even weather-related difficulties such as heavy rain have not brought construction activ-

SERVICE OFFER

RHOMBERG SERSA DEUTSCHLAND

1 *DEVELOPING* **IDEAS** *TOGETHER*

ROUTE OPTIONS

FOCUS ON

SUSTAINABILITY

2 ***SUP-PORT***

- REGULATORY **APPROVALS**
- ALL **TRACK SYSTEM PLANNING**
- **SURVEYING** THE NEW TRACK SYSTEMS

3 SOIL *ANALYSIS* *for* **SUSTAINABILITY**

4 **MATERIALISATION** **&** ORGANISATION OF ***CONSTRUCTION SITES***

5 FOCUS ***ON*** CONSIDERATION

- OPERATIONAL **WORKFLOWS**
- **RAIL TRANSPORT**

ities to a standstill: Thanks to a clever technology migration and the support of the client, this challenge could also be mastered. Weekly construction consultations between client and contractor were standard practice in order to provide the client with an up-to-date overview at all times. In addition, they were also invited to be present at unusual activities, such as plate load tests or the use of the tamping machine complex. The effort paid off: after completion on time and on budget, Project Manager Katja Kaiser explicitly thanked Romonta GmbH on behalf of all those responsible for the project for the performance shown, the high level of expertise and, in particular, for the high degree of honesty and personal support.

02

MACHINERY

MSP MONITORING CAR

- **Standardised & compact monitoring car for loaded measurement**
- **Universal use with different coupling and brake systems**
- **Combination of measuring systems for track surveying**
- **Speeds up to 80km/h**
- **Autonomous measurement data acquisition**

MONITORING CAR FOR THE SWISS METRE GAUGE

Standardised monitoring car for track surveying

Fabian Angehrn
Diagnostics

THE MERGER OF EXISTING INDIVIDUAL SERVICES AND NEW PRODUCTS INTO A UNIFORM SERVICE PORTFOLIO PROVIDES COST SAVINGS FOR CUSTOMERS.

With ARGE FahrwegDiagnose and its partners iNovitas AG, Kistler Instrumente AG and Sersa Maschineller Gleisbau AG, synergies of existing and new services in the fields of measuring technology, geomatics and rail infrastructure construction and maintenance are created. In addition to measurement data acquisition, the focus is on customer-oriented visualisation and evaluation of the data.

The monitoring car is a diagnostic vehicle for standardised and loaded measurement in accordance with EN 13848, which is so far unique to the metre gauge. The universal vehicle, which is equipped with various buffer and braking systems, can be used to measure metre-gauge railways at speeds of up to 80km/h. The following parameters can be recorded: track geometry, rail cross section wear, overhead contact line position, RealityCapture image service and clearance gauge measurements with stereo and 360° cameras as well as track stiffness based on subsidence measurements.

For the georeferenced visualisation of the data, ARGE FahrwegDiagnose is developing a dashboard with easy and hierarchical access to the relevant key parameters and evaluations. The measurement database IRISSYS is used for detailed data analysis and the generation of measures for maintenance and renewal. IRISSYS can also calculate quality grades (e.g. network status report) and provide forecasts. Great importance is attached to the interfaces between the ARGE FahrwegDiagnose systems and the customers' systems such as GIS, Toporail and Asset Management.

Measurements comparable throughout Switzerland with the new metre-gauge monitoring car form the basis for uniform algorithms and maintenance concepts for metre-gauge railways.

KRC500/ KRC1200

- **Optimised lifting capacity for metre-gauge railways**
- **Track renewal up to 30m track yokes with concrete sleepers**
- **Gradients up to 70% with electromagnetic rail brakes**
- **Very tight radii up to 45m**
- **State-of-the-art control for safe operation**

NEW TRACK-BOUND CRANES FOR SWISS MARKET

In 2020, an ultra-modern track-bound crane for metre-gauge railways went into operation, which will be followed by one for standard-gauge railways in 2021.

THE NEW METRE-GAUGE TRACK-BOUND KRC500 CRANE HAS BEEN IN SUCCESSFUL OPERATION SINCE SPRING 2020. IN SUMMER 2021, THE NEW STANDARD-GAUGE TRACK-BOUND KRC1200 CRANE WILL FOLLOW, WITH THE MAIN FOCUS ON SWITCH RENEWAL.

The commissioning of the first metre-gauge track-bound KRC458 crane in 2001 initiated a continuous change in construction sites. The metre-gauge railways, in particular the Rhaetian Railway (RhB) and the Matterhorn Gotthard Railway (MGB), developed new procedures that made optimum use of the possibilities of this machine. One example is the standard procedure for bridge refurbishment at the RhB, where the track-bound crane installs auxiliary bridges and plays a central role in erecting the scaffolding.

In 2018, the Rhomberg Sersa Rail Group in Switzerland began initial investigations into an additional track-bound crane for metre-gauge railways. The manufacturer KIROW (Leipzig) and

Sersa Maschineller Gleisbau AG analysed the construction sites of the KRC458 and developed the new KRC500. The latest technology made significant improvements possible. In this way, the so-called lifting capacity curves have been significantly optimised in comparison to the previous track-bound KRC458 crane. Another focus is the safe operation on the network of metre-gauge railways, especially with gradients up to 70%. A modern brake system including electromagnetic rail brakes from the Swiss manufacturer FACTO (Olten) ensures that the crane can be operated precisely and safely even under such extreme operating conditions.

In spring 2020, the crane was transported by road from Leipzig to Landquart on three lorries and put into operation. The inspection by the RhB lasted just under a month and included functional tests on the Bernina railway. The new KRC500 went into

operation in mid-June 2020 and, together with the experienced crane operator Sepp Rohner, is proving its efficiency.

The new standard-gauge track-bound KRC1200 crane will go into operation in summer 2021. Together with the manufacturer KIROW, the previous KRC1200 and its applications were analysed in detail and a new version, optimally adapted to the construction sites for switch renewal in Switzerland, was developed.

Matthias Manhart
Rhomberg Sersa Technologie

“THIS TRACK-BOUND CRANE COMBINES ALL THE CAPABILITIES OF A LARGE CRANE AND IS BOTH A SIGNIFICANT INNOVATION AND A REAL ENRICHMENT FOR US IN THE FIELD OF METRE-GAUGE / MOUNTAIN RAILWAYS.“

Mirko Sennhauser
Managing Director Sersa Maschineller Gleisbau AG

CASE CX 75C-SR RR

Max. gradient: 250%

Use on rack and adhesion railways

Systems: Abt, Strub, Riggenbach & Von Roll

Approval up to 75% for adhesion

Emergency lowering at >60%

CLIMBING MOUNTAIN SLOPES

Capolago-Monte Generoso rack railway renovation

Stefano Rossi
Construction Manager South

SERSA SCHWEIZ HAS IMPRESSED FROM THE FIRST STAGE OF RENOVATION WITH THE USE OF A NEW TYPE OF 8-TONNE CRAWLER EXCAVATOR WITH RACK-AND-PINION OPERATION.

The demands were high: in addition to the mechanical requirements such as excavator equipment and lockable holders for equipment parts, the new crawler excavator of Sersa Schweiz should be able to be quickly converted to track gauges of 800/1000 and 1435mm and should also be able to be used on rack-and-pinion tracks with the Abt and Strub/Riggenbach/Von Roll systems – which can have a maximum gradient of up to 250%. This was made even more difficult by the need to cover the difference in height between the upper edge of the track and the theoretical contact point of the traction units' pinion with the teeth of the slats, which vary from installation to installation. The originally planned deadline was therefore extended by a full two years. Finally, the new Case CX 75C-SR RR crawler excavator was delivered in October 2019. And it has already proved its worth in the Monte Generoso renovation project.

The excavator is compact and makes optimum progress on the steep ramps of the rack railway without the need for exceptionally high drive power. Its performance also impressed the excavator operators, who feel safe in the driver's cab. The traction drives have a hydrostatic transmission and are both braked. 'Bell-shaped' wheels ensure that changing gauge is simple and therefore adjusting to the required track width is rapid. Exchanging the cogwheels (racks), which also requires a height adjustment, is somewhat more complex. An innovative construction and conversion procedure was developed specifically for this purpose. The pinions of the wheels and the rack, although vertically on the same level, are divided into three parts, allowing the central part to position the corresponding axle at a different height. Thanks to the possibility of installing an intermediate system without rack and pinion, the crawler excavator can also be used on sections with adhesion drive with a maximum gradient of 70%.

RE 420 LOCOMOTIVE

First electric locomotive of the Rhomberg Sersa Rail Group

Very high output: hourly output of 4700KW

277 locomotives were built (largest locomotive family CH)

The Re 420 is available in many sub-variants

Maximum speed of 140km/h

NEW ROLLING STOCK AT SERSA SCHWEIZ

First electric locomotive and new container cars.

Rudi Hoz
Customer and market support
Switzerland

SERSA SCHWEIZ INVESTS IN EFFICIENT TRACTION AND TRANSPORT MEANS FOR RAIL-BOUND CONSTRUCTION SITE AND BULK GOODS LOGISTICS.

New electric Re 420 main-line locomotive

At the end of 2019, Sersa Schweiz took over its first electric main-line locomotive from the railway company Travys in Yverdon: a four-axle Re 420 electric locomotive weighing around 80 tonnes with an hourly output of 4700KW.

The locomotive is in a very good technical condition and has proven itself in daily use for freight and passenger transport. It is used as a main-line/reserve locomotive for transporting beets to the Aarberg sugar factory every autumn, from September to December, as a means of traction for our trains with track construction machines. It provides valuable support, in particular for short-term and time-critical transports as well as for construction and bulk goods trains, including in cooperation with other railway companies.

So far, it has already brought large quantities of 'sweet cargo' (i.e. sugar beets) and many track construction machines to their destination on time.

48' container cars from Wascosa as base vehicle

Sersa Schweiz intends to use multifunctional – and multimodal – freight wagons for rail-bound construction site and bulk goods logistics in the future. The ideal vehicle for this purpose was a 48'-long (1' = approx. 30.48cm) container car developed by the wagon hire company Wascosa AG, Lucerne. It is a four-axle, relatively short car in a modern design with low-noise brakes and a maximum speed of 120km/h, among other benefits, while at the same time offering a high payload. Various containers and swap bodies (such as bulk goods containers, silo containers or flatbed trailers) can be loaded on the car thanks to flexibly arranged container pins. The first 20 cars have now arrived in Switzerland and will soon go into service.

BDS 2000-4 E³

- **Environmentally friendly hybrid system**
- **Reduction in noise emission**
- **Regeneration of braking energy into the overhead wires**
- **Minimisation of wear e.g. of the brake components**
- **Ergonomic operating stations**

INNOVATIVE MECHANICAL ENGINEERING

E³ – the next development step in mechanical engineering

WITH THE NEW E³ MACHINES FROM BAHNBAU WELS, THE RHOMBERG SERSA RAIL GROUP IS CONSISTENTLY AND SUCCESSFULLY PURSUING ITS PATH TO TECHNOLOGICAL LEADERSHIP.

The two new additions, a Unimat 09-8x4/4S Dynamic E³ tamping machine and a BDS 2000-4 E³ ballast management system, do not only impress with their new external design but also with their environmentally friendly hybrid technology. E³ stands for 'Economic – Ecologic – Ergonomic'. The most striking difference to the previous generation of machines is the introduction of electricity as a means of supplying energy to the machines. Whenever available, environmentally friendly electricity is drawn from the overhead wires. It is only when there is no catenary power available that all the energy is provided by a generator driven by a diesel engine. This ensures a seamless energy supply to the machines.

Electric braking is also possible with this technology. For this purpose, the kinetic energy is converted into electrical energy via the traction motors and fed back into the network of overhead wires. This is called regenerative braking – the most economical and environmentally friendly way to brake. If there is no possibility of absorbing the electrical braking energy in the network of overhead wires, it is dissipated via braking resistors on the roof. A major advantage is that the shoe brakes are not subjected to thermal stress or wear during purely electric braking.

In addition to their environmentally friendly features, these machines are also characterised by their much lower noise emission. In fully electric operation, they simply whisper.

With the Unimat 09-8x4/4S Dynamic E³, further significant innovations have been implemented in addition to hybrid technology, including the special configuration of the tamping units. The '8x4' in the name of the machine already reveals this. Eight individual tamping units, each with four tamping picks, are available for this machine. The units are divided in longitudinal direction, so that besides two sleepers in one operation, individual sleepers can also be processed. The transverse division

MACHINES
MACHINES
MACHINES

09-8X4/4S DYNAMIC E³

- **All the benefits of the hybrid system like 2000-4 E³**
- **Fully flexible when working with switches**
- **Sleeper recognition system**
- **Switch tamping assistant**
- **Ergonomic operating stations**

into four separate units is the basis for full flexibility when working with switches.

Due to a sleeper recognition system for the track area, the operator only needs to take over the cycle control on a per-case basis. This significantly shortens the high concentration periods for the machine operator.

A switch tamping assistant rounds off the machine's comfort. Working on switches is therefore largely automated. This relieves the operator and allows them to focus their full attention on monitoring the tamping process.

With the purchase of the new machines, the Rhomberg Sersa Rail Group not only stays in line with the times, but also sets standards in terms of economy - ecology - ergonomics. Perfect interaction between human and machine optimises the result for the customer – in line with E³.

"THIS IS HOW WE ACHIEVE OPTIMUM RESULTS FOR OUR CUSTOMERS AND ACT SUSTAINABLY."

Markus Pfarl
Head of Mechanised Track Construction, Authorised Signatory Bahnbau Wels

03

PRODUCTS


82%
6000
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5900
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1D
18:00
6000
5500
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7000
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PIT STOP

The RM90 ballast cleaner in Ireland was successfully refurbished.

THE RM90, ALSO KNOWN TO MANY AS 781, IS A VALUABLE SUPPORT FOR THE COLLEAGUES OF RHOMBERG SERSA IRELAND IN MAINTAINING THE RAIL INFRASTRUCTURE ON THE EMERALD ISLE.

Currently in service for Iarnród Éireann / Irish Rail, the refurbishment of the ballast cleaner was on the agenda from December 2019. After all, the special Plasser & Theurer machine had already been in operation for eleven years. This took a total of 537 man-days.

One of the challenges for the team, led by Rhomberg Sersa Ireland Projects Manager Peter Watson and Ian Sempers of Neil Thorne Engineering, was separating the main units of the RM90 and then transporting them to the Iarnród Éireann / Irish Rail Inchicore depot in Dublin. As one unit was too large to fit on the depot cross beam, it took lateral thinking and cooperation from the Irish Rail team to ensure it could be transported safely. The work included the complete reconstruction of the main frame and structure of the A1 conveyor belt as well as the removal and installation of the ascending and descending troughs supporting the cutting chain. In addition, new conveyor belt scrapers were installed to improve the cleaning of the conveyor belts and to reduce rubbish and waste falling off the conveyor belts. The majority of the conveyors were repaired and refurbished in various stages and equipped with new belts. The local members of the Rhomberg Sersa Ireland expert team were supported by colleagues from Rhomberg Sersa North America. The work was successfully completed in March, just in time for the start of the first renewal work in 2020. Now the RM90 is fully operational again and is used daily throughout the network for ballast cleaning.

Steffen Zanner
Site manager

REDESIGNING KARLSRUHE

It takes a lot of construction for the tram to run

3.2 KILOMETRES OF TRACK, 1 QUADRILATERAL, 1 TRIANGLE JUNCTION AND 2 MORE JUNCTIONS WITH SWITCHES, ALL DOUBLE TRACK, AND A LOT OF CONCRETE. ALL THIS IS BEING BUILT BY RHOMBERG BAHNTECHNIK WITH ITS CIVIL ENGINEERING PARTNERS GRÖTZ GMBH & CO. KG AND REIF BAUUNTERNEHMUNG GMBH & CO. KG. IN A VERY CONFINED SPACE IN THE CENTRE OF KARLSRUHE. THE WORK IS IN FULL SWING.

The most complex part of the entire public transport project, which will take around two and a half years to complete, was scheduled to start right at the beginning in the summer of 2019: the double-track switch quadrilateral. Since the north-south connection in Karlsruhe had to be cut at another point for the construction work, the quadrilateral was planned for the first construction phase.

In order to be able to produce this, the northern access route to the newly constructed quadrilateral had to be built first. The quadrilateral consists of a total of five sections. Each section consists of several track elements, which are mounted and fixed on site on a curved and concreted track support plate. The logistical masterpiece of those involved, who had to block road sections for the transport and assembly of the elements weighing up to 10 tonnes, is particularly noteworthy.

The entire line will be constructed in various Rheda City systems and track support plates in a light mass-spring system with fibre-reinforced concrete, the majority of which will be grassed tracks. Positive ‘side effect’: the project will further improve the look of Karlsruhe and make it considerably greener.

Currently, in addition to most of the switch quadrilateral and its access routes, over 400 metres of track have already been installed using the latest digital methods. The next major construction phase of the overall building project will start in autumn 2020.

The project is part of the ‘Karlsruhe combined solution’ and will be built on a road tunnel through which the new Bundesstrasse 10 passes.

SUCCESSFUL TOGETHER

Innovations for Deutsche Bahn are a challenge – which Rhomberg Sersa Rail Group accepts.

DB AG HAS AN ALMOST PERFECT INNOVATION MANAGEMENT SYSTEM IN WHICH NEW IDEAS ARE CONSTANTLY IDENTIFIED, GENERATED AND IMPLEMENTED THROUGHOUT THE COMPANY. THIS IS ALSO NECESSARY BECAUSE THE GROUP HAS TO ENSURE THE MAINTENANCE AND OPERATION OF A NETWORK THAT IS OVER 33,000 KILOMETRES LONG – WHILE ADHERING TO THE STRICTEST SAFETY AND QUALITY STANDARDS. IN ADDITION TO STAYING ALERT, EXPERTISE AND EXPERIENCE ARE REQUIRED.

INNOVATIONS

Resources that RSRG has at its disposal for one of its largest customers in Germany: "Thanks to our track builders, construction managers and foremen, we have an 4 incredible amount of railway-specific 5 knowledge and experience", explains Norman Krumnow, Head of Innovation and Authorised Representative at Rhomberg Sersa Deutschland. "This enables us to question and optimise products, technologies and processes in a targeted manner." With success, as shown by a particularly innovative example: the V-TRAS transition module

Norman Krumnow
Head of Innovation/Authorised Signatory

FOR DEUTSCHE BAHN

from slab track (Feste Fahrbahn, FF) to ballast roadbed (Schotteroberbau, SchO). "Due to the different stiffnesses, track position errors repeatedly occur between these two types of track superstructure in crossing areas," explains Krumnow. "These have a negative impact on driving comfort and, unfortunately, travel time." RSRG has succeeded in producing a linear reduction of the high stiffness from the FF to the SchO, therefore virtually resolving the track settlements.

But this is not enough for RSRG: "We are currently in the process of further developing the product for installation in the crossings between art/engineering and earthworks," reveals Krumnow. "Our goal is clearly to push ahead with innovations together with Deutsche Bahn and thus generate economic and technical success."

1 Rail fastening elements| 2 Rail| 3 Transverse support elements 4 Base layer | 5 Subsoil

1 Slab track | 2 FF support & fixed support for V-TRAS 3 Elastomer (blue) | 4 Standard sleeper | 5 V-TRAS module

A GOOD SOLUTION IMPROVED

Rhomberg Bahntechnik impresses its customer with clever further development during the repair of the Bergünerstein Tunnel.

DUE TO THEIR AGE, MORE THAN HALF OF THE 115 TUNNELS IN THE RHÄTISCHE BAHN (RHB) NETWORK CURRENTLY REQUIRE RENOVATION. FOR THIS PURPOSE, THE RAILWAY OPERATOR DEVELOPED A NEW, STANDARDISED RESTORATION METHOD: THE 'NORMALBAUWEISE TUNNEL'. THIS IMPROVES THE QUALITY AND ECONOMY OF THE TUNNEL RENOVATIONS, INCREASES THE SAFETY STANDARD AND EXTENDS THE SERVICE LIFE OF THE TUNNELS TO 70 TO 100 YEARS.

A good and very successful method – which Rhomberg Bahntechnik was able to improve once again for the Bergünerstein Tunnel: for the conversion from ballast to the definitive slab track, the railway engineering specialists were able to convince the RhB's representatives with the IVES system adapted for the 'Normalbauweise'. Here, precast concrete elements are used to a large extent, which enable a daily output of 20 metres during the seven-hour night closures. This solution is more economical for the client and also brings some technical advantages: with a smaller excavation cross-section, meaning less bed lowering, and a more stable track position, the RhB's services such as the installation of auxiliary bridges or the supply of superstructure materials are reduced. The complete tunnel widening with a daily capacity of 3.5 metres can subsequently be carried out during night intervals.

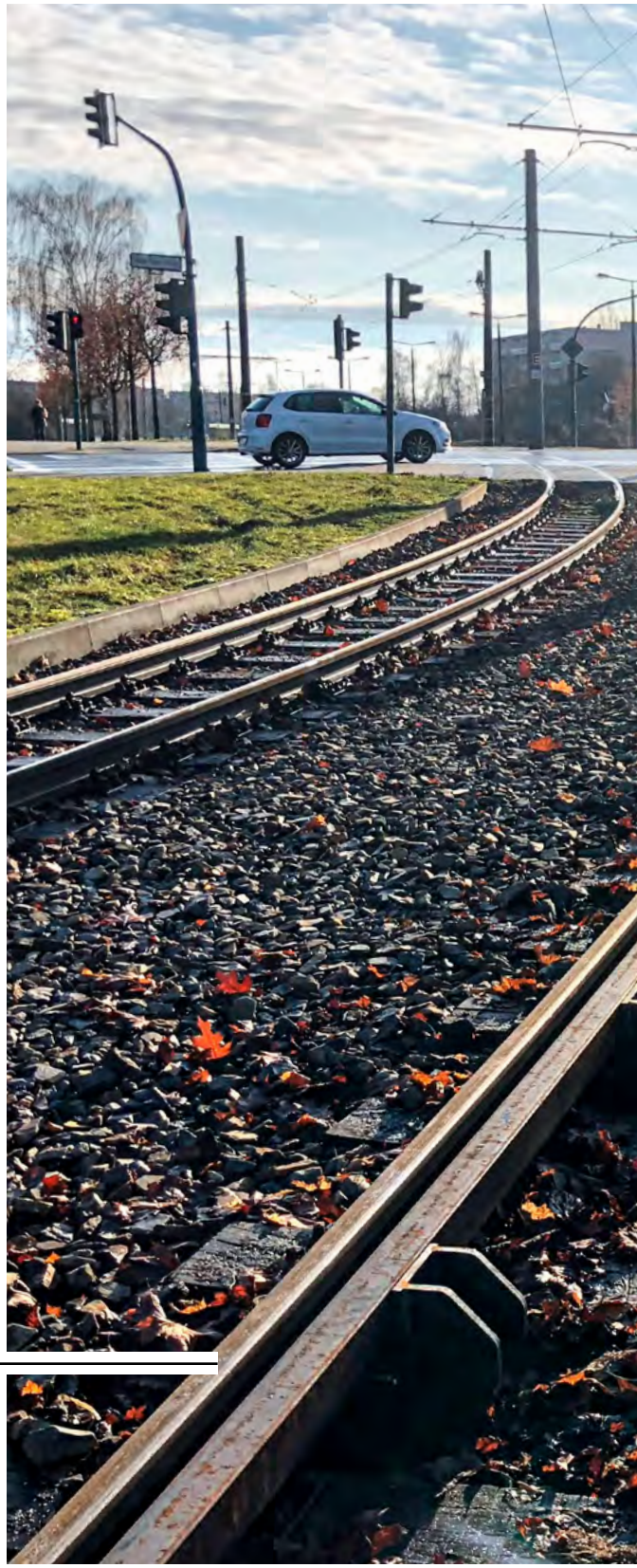
The project volume is approximately CHF 11.5 million. Construction began in autumn 2019, with completion scheduled for 2021.

Lukas Herburger, Project Manager: "This solution for the maintenance of the Bergünerstein Tunnel once again proves the reputation of Rhomberg Bahntechnik and the entire Rhomberg Sersa Rail Group as a full-service provider in railway technology with a strong customer focus and innovative strength."

INNO-
VATION

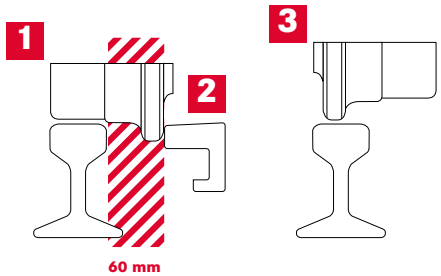
KEEPING ON TRACK WITH INNOVATIONS

How Rhomberg Sersa uses its expertise and experience in commercial track construction to secure its customers' infrastructures. An example from Germany.



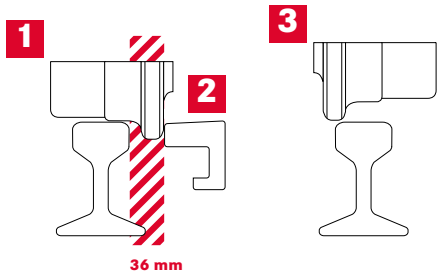
IN COMMERCIAL TRACK CONSTRUCTION, ACCURACY AND COMPLIANCE WITH ALL DIMENSIONS FOR ALL TRACK GAUGES ARE ESSENTIAL. ONLY IN THIS WAY CAN THE OPERATIONAL SAFETY OF THE TRACK SYSTEM BE GUARANTEED.

GROOVE WIDTH 60MM



1 Left wheel / track| 2 Check rail
3 Right wheel / track

The UIC33 check rail fulfils its anti-derailment function with 60mm from the groove entry.



1 Left wheel / track| 2 Check rail
3 Right wheel / track

due to the reduction of the groove width in special cases to 36mm, the wheels climb up when changing bends and inclinations in the direction of travel.

GROOVE WIDTH 36MM

Karsten Hähnel
Senior Construction Manager

And this is the only way to prevent the most serious of all accidents with a technical background: derailments. If they do occur, however, it is essential to have perfect command of the wheel/rail system in order to get to the bottom of the cause and ensure a reliable solution.

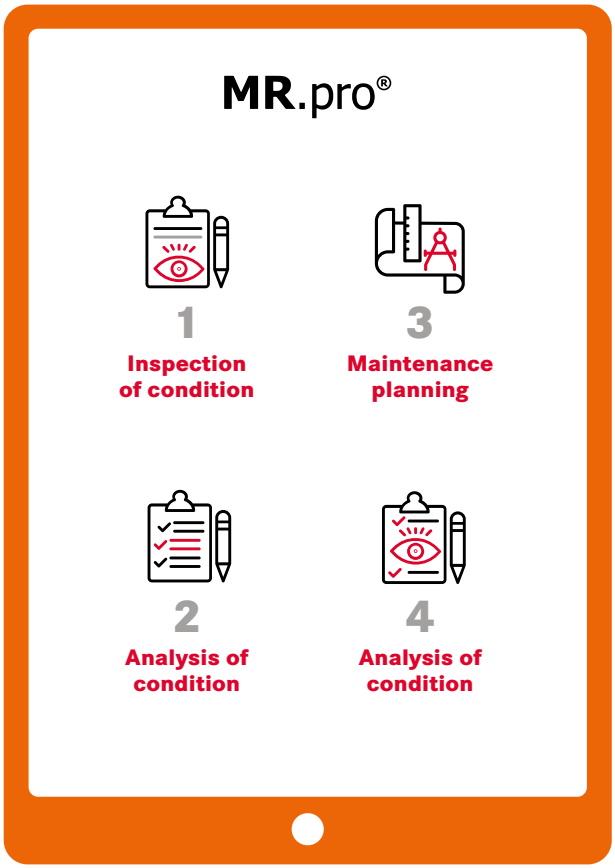
This happened in November/December 2019, when repeated derailments with one type of vehicle occurred in a curve in the Stadtverkehrsgesellschaft Frankfurt (Oder), SVF, network after 17 years of service. Rhomberg Sersa Deutschland, which was called in to help, was able to prolong the service life of the track in a short-term closure by replacing the rails of the upper and lower curve, re-tamping the ramp and retrofitting a check rail, while at the same time providing the customer with long-term safety against derailment.

The innovation here was extra guard rail support blocks specially developed for the UIC33 rail, which also allow the groove width to be adjusted. For this purpose, the supports were retrofitted in the sleeper area to the existing S49/ S54 rail in the lower curve. As is so often the case, the best solution was also the most logical one: if you imagine a conventional guard rail in a switch and a check rail mounted in the sleeper area on a double ribbed base plate, then the retrofittable guard rail support base for a check rail is the next logical step. This is because the UIC33 check rail fulfils its anti-derailment function with 60mm from the groove entry and, by reducing the groove width to 36mm in special cases, prevents the wheels from climbing when changing bends and inclinations in the direction of travel.

SOFT-
WARE

DB VEHICLE MAINTENANCE RELIES ON MR.PRO®

MR.pro® 4.0 maintenance for railway networks: turning data into action.



DB FAHRZEUGINSTAND-HAL-TUNG GMBH IN KREFELD

Founded in 1892, the Krefeld plant has adapted its infrastructure and range of skills to combat the challenges of modern electric multiple-unit trains for local and long-distance transport. The focus is on heavy maintenance, i.e. general inspections and revisions. The plant also specialises in repairs to aluminium rail vehicles after accidents and specific refits. Around 1,000 employees use their in-depth, specialist knowledge to get the vehicles back on the rails quickly. On an area of 200,000m² – equivalent to 28 football pitches – electric multiple-unit trains for long-distance and local transport are repaired and modernised. Since 2019, DB has been using the MR.pro® software to maintain the extensive track systems in the Krefeld plant.

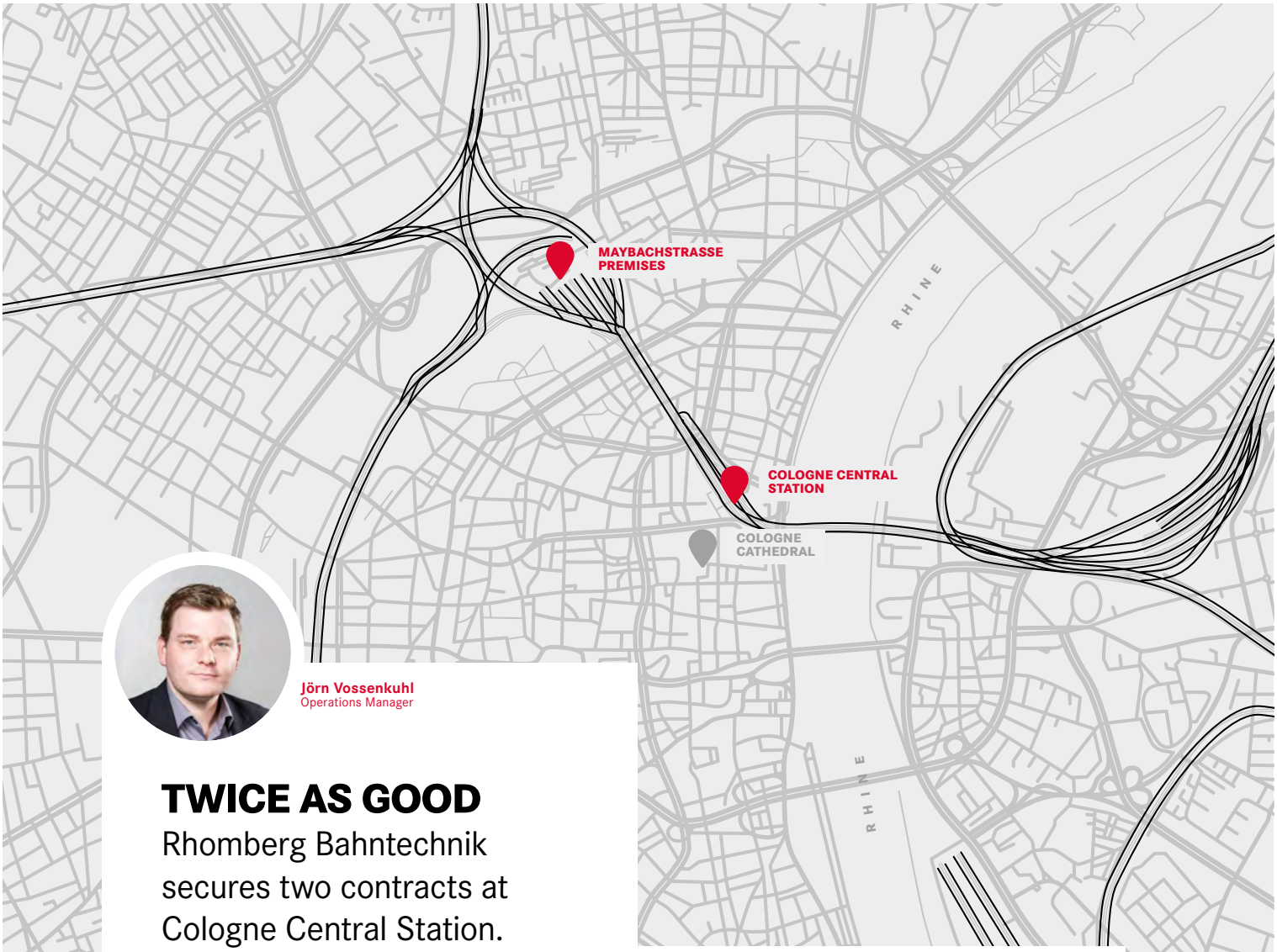
MR.PRO®

The MR.pro® maintenance software developed in-house by the Rhomberg Sersa Rail Group is a hybrid of expert system and technical information system. Specially tailored to the features of railway networks, MR.pro® offers a practical management system that masters the entire railway infrastructure in a uniform layout: traction power supply, overhead contact lines, signalling and communication technology, stops, buildings and supporting structures. Combined with ERP systems, a unique workflow is created in the maintenance cycle.

MR.pro® supports the management of track networks with so-called 'digital twins', which can be easily recorded, documented and evaluated. In addition to process optimisation, the scope of the program includes monitoring and managing deadlines, such as revisions, inspections and warranty durations.

MR.pro® offers the best results of all rail infrastructure software products available on the market:

- transparent, consistently visualised information.
- GIS viewer with true-to-scale, geo-referenced object display.
- high user acceptance thanks to high degree of practicality.
- efficient data acquisition and maintenance of 'digital twins' with little effort.



Jörn Vossenkuhl
Operations Manager

TWICE AS GOOD

Rhomberg Bahntechnik secures two contracts at Cologne Central Station.

IN SEPTEMBER 2019, RHOMBERG BAHNTECHNIK ESSEN WAS AWARDED THE CONTRACT FOR THE 'ETW-KÖLN HBF' PROJECT BY DB NETZ AG. IN ADDITION, DB ENERGIE GMBH AWARDED THE RAILWAY TECHNOLOGY SPECIALISTS FROM ESSEN WITH THE CONTRACT FOR THE ASSOCIATED NEIGHBOURING 'ESTW-KÖLN HBF-MAYBACHSTR.' PROJECT FOR A 10KV TST.

The total order volume for these two projects amounts to around €2.7 million. Work began in January 2020 with the planning of the 10KV transformer station and will end in June 2025 with the completion of the contractual work, which includes the new construction and modernisation of the switch heating systems around Cologne Central Station.

The projects comprise the extension and in part the renewal of the technical equipment, such as the construction of the transformer station contained in the basement of the operating building, the medium-voltage system extension including telecontrol technology, the earthing system, the cable pull as well as the associated planning services and the resulting low-voltage systems of the 'ESTW-Köln Hbf' control centre and its technical and maintenance rooms.

The greatest challenge in this project is that during the entire deconstruction and new construction work, the dispatchers' technology in the operating building must remain in operation and under no circumstances be influenced or even disturbed by the construction work in the same building. This was ensured by previous, costly switching of the energy supply.

In addition, in the course of the renovation work in and on the building, electromobility on the Maybachstraße premises will also be taken into account: by 2025, a total of seven 22kW charging points with two charging sockets each for at least 14 electric vehicles will be installed in the car parks. The associated switchgear including the overvoltage protection devices are also to be supplied and installed by Rhomberg Bahntechnik.

NEW WENDLINGEN-ULM LINE: THE MAJOR PROJECT POWERS AHEAD

The track paver appears: the first kilometres on the open track and the start of equipping the railway technology

60 KILOMETRES OF DOUBLE TRACK, 11 TUNNELS, €243 MILLION INVESTED AND THE GENERAL CONTRACTOR AGREEMENT FROM THE IMPLEMENTATION PLANNING AND THE EXECUTION OF THE TRACK AND THE RAILWAY TECHNOLOGY TO PARTICIPATION IN THE COMMISSIONING: THE MAJOR NEW WENDLINGEN-ULM LINE PROJECT CONTINUES.

Following the award of the contract for the entire railway engineering extension for two lots of the Stuttgart-Ulm railway project to the Arbeitsgemeinschaft Bahntechnik Schwäbische Alb (ARGE BSA), the work is progressing well: in May 2020, the first 33 kilometres were handed over to the ARGE partners Rhomberg Bahntechnik GmbH and Swietelsky Baugesellschaft m.b.H. Track construction is in full swing: the slab track in both bores of the approximately six-kilometre long Albabstieg Tunnel has been fully installed and construction of the track on the open track has also been underway since August 2019. Due to the effects of the weather, extended measures are required here to protect the track, which has been installed with millimetre precision, before and during concreting. An exciting challenge for the team, but one that was mastered brilliantly after the first control measurements.

A start has also been made in the rail technology: in the Albabstieg Tunnel, for example, a total of around 220 kilometres of cable have been laid in several construction phases since mid-April 2020 to supply all components of the electrotechnical and electromechanical equipment as well as the telecommunications and railway energy systems with power and data connections.

Probably one of the most decisive challenges for the whole ARGE BSA team arrives with the handover of the second half of the GU 3 construction section, which will take place shortly. As a result, some of the tunnels, which are up to 8.8 kilometres long, can only be built in dead ends. This requires a sophisticated rescue and logistics concept, which will challenge all those involved, especially with the large number of parallel operations.

Sybille Ritzkowsky
Construction Management

04

ON LOCATION

RAPID DISASTER RELIEF

Rhomberg Fahrleitungsbau supports ÖBB in repairing damage.

IN EAST TYROL AND CARINTHIA, HEAVY AND PERSISTENT SNOWFALL CAUSED CONSIDERABLE DAMAGE TO THE CATENARY SYSTEMS OF AUSTRIAN FEDERAL RAILWAYS. THE ÖBB ASSEMBLY TEAMS REQUESTED THE SUPPORT OF RSRG TO REPAIR THE DAMAGE.

In November 2019, the snowfalls caused mudslides, rockfalls, landslides and avalanches. The prevailing Föhn wind made the situation even worse, as wet snow caused trees to break. Due to the damaged traction power supply, many routes had to be discontinued and replacement rail traffic had to be set up. The damage to the systems was so extensive that the ÖBB service teams responsible for the overhead lines needed support from Rhomberg Fahrleitungsbau GmbH, the specialist for overhead lines and electrotechnical systems in the Rhomberg Sersa Rail Group, for rapid and sustainable damage repair.

Starting in mid-January, thanks to the excellent, partnership-based cooperation with the individual service teams of ÖBB, extensive services could be provided in just fourteen days in the Mittewald-Abfaltersbach section. The damage was repaired with two work teams of ten specialist fitters and two motor tower cars working in shifts. Thirty cantilever arms for overhead lines, some heavily damaged, were dismantled and replaced. Around 1.5 kilometres of defective catenary system had to be changed. Almost five kilometres of peak and return conductor cables were replaced and tied into about 130 bases.

Due to the geographical location of the railway line, the fitters had to carry out the work under difficult conditions. In the very narrow and low-lying track system, there were temperatures of -15°C during the day. Despite these challenges, the Rhomberg Fahrleitungsbau GmbH installation team was able to contribute to the rapid repair of the damage and thus provide support to resume operations.

“WE SUPPORT OUR CUSTOMERS IN EMERGENCIES QUICKLYAND UNBUREAUCRATICALLY.”

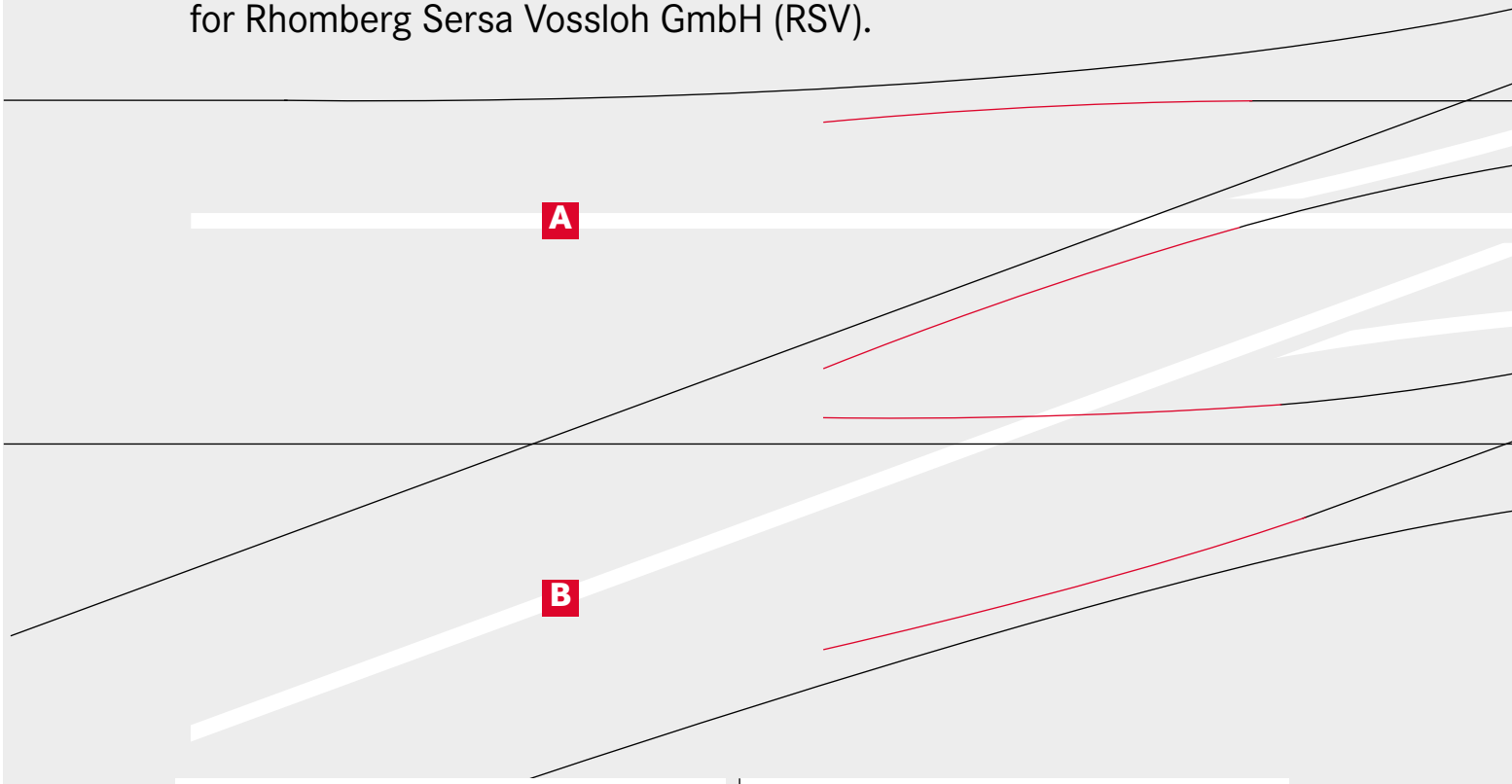
Harald Schwarz
Managing Director of
Rhomberg Fahrleitungsbau

SWITCHES AND CROSSINGS

A CASE FOR RSV

The first mobile switch service was established in 1992 by switch manufacturer Vossloh Laeis. The founders of that time are now working for Rhomberg Sersa Vossloh GmbH (RSV).

Andreas Marx
Managing Director Föhren



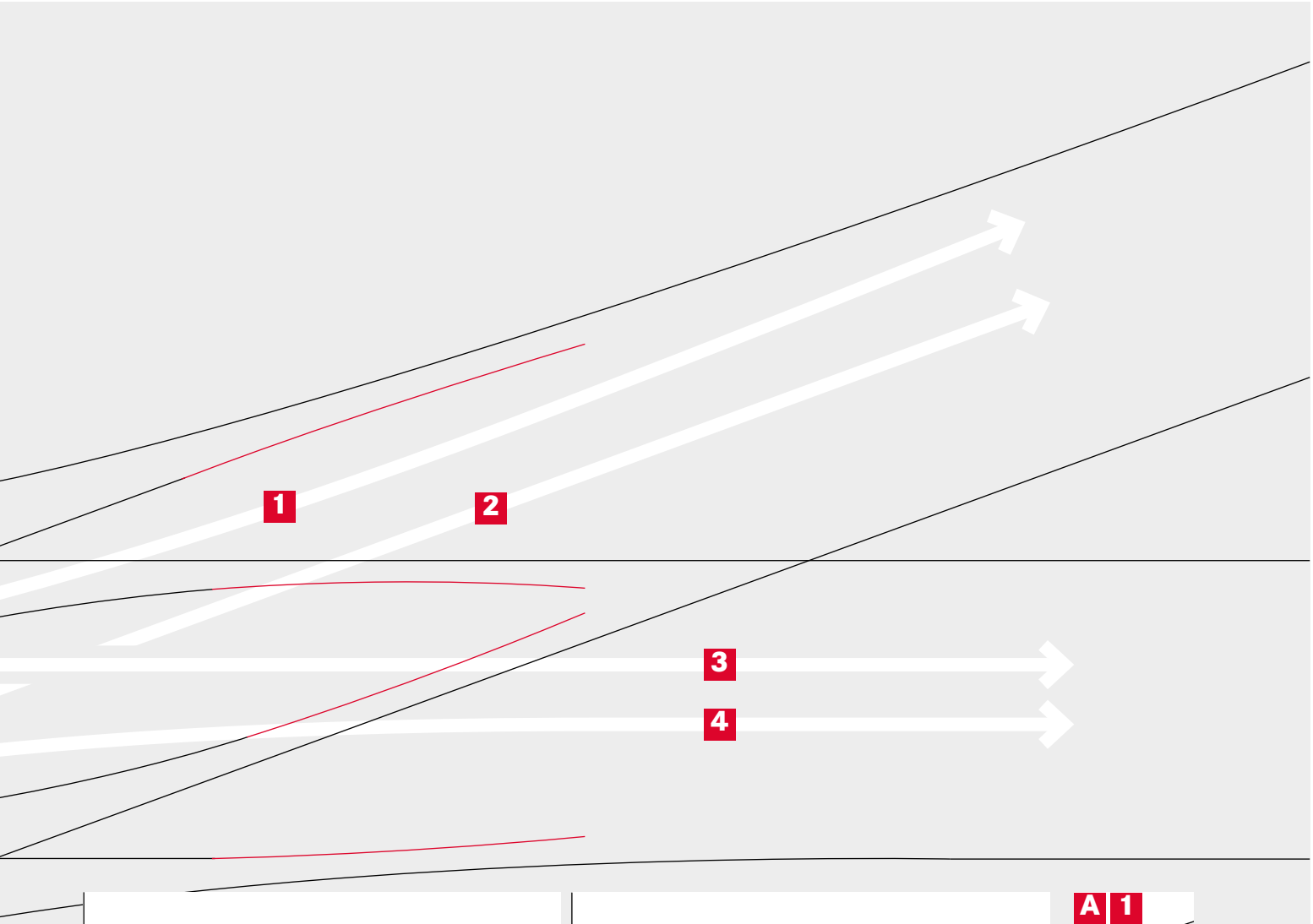
THANKS TO THE TAKEOVER OF THE VOSSLOH TRACK AND SWITCH SERVICE UNITS IN DORTMUND, HAMBURG AND MAGDEBURG, THE CORE TEAM HAS NOW GROWN TO 50 PEOPLE.

Professional switch maintenance requires specialist knowledge for which there is hardly any literature outside the regulations of the state railways. With the founding of BahnWege-Seminare® in 1994, switch technology was made accessible to a wider audience with the help of specialists, such as Günter Welz, who have mastered both manufacturing and maintenance.

For today's Rhomberg Sersa Vossloh GmbH, specialised switch maintenance is one of the core tasks. With teams of two mechanics and electricians, the company is able to carry out all work on switches. This holistic maintenance from a single source minimises interfaces and waiting times, as work can be carried out independently of other trades.

Complex and intricate switch systems occupy a special position, including crossing switches (see box). Knowledge of this resembles a kind of secret science. A need for this arose at a construction site on Lake Constance:

In direct comparison: double slip switches with inside (pictured left) and outside switches (pictured right)



SWITCH RENEWAL DB LINDAU-REUTIN STATION

Problems were caused in November 2019 by a double slip switch installed by Rhomberg Gleisbau / Bahnbau Wels in Lindau. For five of the eight switch rails, it was not possible to establish a safe end position on the stock rails and studs because they had a high residual voltage. Due to the resulting narrowing of the gauge, acceptance and operational release were not possible.

RSV was asked for rapid support: our switch specialist Günter Welz, who has more than 40 years of experience in the production and maintenance of switches, went to the site as quickly as possible. His analysis brought the causes to light and enabled a targeted correction of the double slip switch (DSS) with outside switches. A switch shape that you don't see every day.

At Welz's suggestion, three of the short switches of these DSSs were mechanically separated and then fixed in such a way that they fit correctly on the stock rails and switch supports. The switches were reconnected to the adjoining rails by means of flux-cored wire welding. Now the reinstalled switches were able to be straightened hydraulically without tension.

Günter Welz was able to align the two remaining problem switches without separating the welded joints and also correct the faulty check blocks and studs by grinding, so that the switch support on the stock rails and the track gauges were permanently corrected.

Thanks to RSV's expertise, the selection and implementation of the measures led to immediate success. The special approach also generated lively interest on the part of the client, Deutsche Bahn AG, who had anticipated the need to replace the faulty components, which would have meant enormous economic damage in terms of costs and availability.

DOUBLE SLIP SWITCHES

Slip switches are a combination of a crossing and a switch. Unlike simple crossings, they can be used to change from the crossing track to the crossed track. If this is only possible in one direction, it is called a single slip switch. A double slip switch allows changing in both directions. In both single and double slip switches, the switches can be found inside or outside the crossing quadrilateral.

The 4 tracks at a double slip switch.

PLAYING AT HOME

Operation at Wels Central Station

IN MAY OF THIS YEAR, BAHNBAU WELS HANDLED A COMPLEX CONSTRUCTION SITE NEXT TO THE COMPANY'S HEADQUARTERS AT THE MAIN RAILWAY STATION IN WELS IN PARTNERSHIP WITH THE SPECIALIST DEPARTMENTS OF ÖBB.

The project was carried out in several, extremely complex and coordinated construction phases on behalf of ÖBB-Infrastruktur AG. The construction project comprised the removal of the track ballast bed including soil replacement and the renewal of track and switch systems. The work was done in the area of the heavily trafficked western railway line on tracks 1 and 2 at Wels Central Station while maintaining railway operations on at least one track.

The construction teams of the commercial track construction division at Bahnbau Wels conducted the work of replacing the soil and placing the new base ballast for the later laying of the switches and tracks. Around 9,000 tonnes of ballast and subgrade were removed conventionally with the two-way excavators of Bahnbau Wels and around 5,000 tonnes of 70/150 gravel and 2,500 tonnes of track ballast were re-laid.

“IT WAS A PLEASURE TO WORK IN PARTNERSHIP WITH THE CLIENT ON THIS PROJECT.”

Wolfgang Stroißmüller
Managing Director of Bittner Bahn- und Gleisbau

The re-laying of thirteen switches, two crossings and about 300 metres of track was carried out by ÖBB's 201 construction train with the support of the Mechanised Track Construction department of Bahnbau Wels. Bahnbau Wels’ Kirow crane was used to manipulate the track and switch parts. The tamping work was also done by BBW machines, including the new Universal Tamper 4.0 tamping machine. The final step was the grinding of new rails by Bahnbau Wels’ oscillating rail grinding machine.

“This construction site was an absolute BBW home game and once again confirmed the good cooperation with our proven contractor Bahnbau Wels,” Andreas Zallinger from 201 construction train emphasised the perfect interaction between ÖBB and Bahnbau Wels for this contract.

THE KING'S NEW CLOTHES

Redesign of King's Cross Station, London

A JOB FULL OF TECHNICAL CHALLENGES: AS A SPECIALISED SUBCONTRACTOR OF THE CENTRAL RAIL SYSTEMS ALLIANCE, RHOMBERG SERSA UK IS CURRENTLY PUSHING AHEAD WITH THE CONSTRUCTION OF THE SLAB TRACK IN THE EASTERN BORE OF THE GASWORKS TUNNEL AT KING'S CROSS.

The aim is to be able to put the 170-year-old tunnel back into operation after a 40-year break and therefore make a decisive contribution to creating a safer, faster and more efficient route for the end customer, Network Rail, who operates the station. The mainly bricked, double-track tunnel is 485 metres long and has been used exclusively as an access road since the 1970s.

The greatest technical challenge is without doubt fitting the tracks optimally into the tunnel profile. Part of the tunnel ceiling is in fact an integral component of a canal basin construction, which leads to tight restrictions in height and width. In addition, apartments have now been built above the tunnel, which places high demands on vibration stress and vibration damping. In addition, there are foundations on soft, unknown ground at the portals and interfaces with the complex tunnel geometry and drainage.

The result is a slab track just over a kilometre long, constructed from 2.1-metre-wide, prefabricated elements of the Austrian slab track system (Porr), so that a track can be fitted where other solutions are not possible. 62 of these elements are provided with a softer, elastic insulating layer for vibration damping. A crossing in the tunnel will be built from in-situ concrete using the Sonneville LVT system. V-TRAS modules will be used at the north end at the transitions to the ballast.

KING'S CROSS, LONDON

Borough: Borough of Camden
Opened: 14 October 1852
Renovated: 2008 – 2013
Passengers: 26 million / year
Tracks: 11

JOURNEY TO INNOTRANS IN BERLIN

THE COUNTDOWN IS ON: ON 27 APRIL 2021, INNOTRANS, THE INTERNATIONAL TRADE FAIR FOR TRANSPORT TECHNOLOGY, WILL BEGIN IN BERLIN.

Until then, the Rhomberg Sersa Rail Group railway technology specialists will regularly present exciting topics from the fields of railway infrastructure, machinery and human resources and provide insights into the 'future of mobility', their work and projects on their website www. rhomberg-sersa.com.

You can also find expert interviews on a wide range of topics relating to the company. There is also a newsletter to keep subscribers informed at all times and ensure they do not miss any news about InnoTrans.

JOIN US ON OUR 'JOURNEY TO INNOTRANS' AND VISIT US AT WWW.RHOMBERG-SERSA.COM/INNOTRANS.

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