

# INFORMER

FELBERMAYR GROUP MAGAZINE 1/2017

## **GIGANTIC**

INDUSTRIAL BUILDING FOR 700 STAFF

## **PIONEERING**

EUROPE'S HEAVIEST RAIL TRANSPORT

## **SET UP**

WIND FARM ERECTED 1,700 METRES ABOVE SEA LEVEL

PHOTO: MARKUS LACKNER





# Arrived



**Dear Sir or Madam,**

This time, our preface is titled »arrived«. We thus refer to the latest forecasts published by the EU Commission, according to which the economy is set to grow in all – member states – at least until 2018. This is made possible by investments made by medium-sized companies and the industry as well as the citizens' consumption. And not least by investments in the public sector. It deserves mention that increased productivity and not profit is the declared goal in this context.

In the long run, this will only be possible if politics and the economy form an alliance. Efforts such as the European Fund for Strategic Investments (EFIS) and the European Regional Development Fund (ERDF) are visible signs. Above all, this

is aimed at promoting a more investment-friendly environment for companies and local economies. A practical example for this development is the construction of a power station on the Danube Island on which we report in this issue of In-former.

However, despite all positive news, one should not count one's chickens before they have hatched. Factors like the USA's actions under its new president, the results of the Brexit negotiations and the refugee crisis are still too unpredictable and may yet spoil things for the EU's strategists.

However, it can't hurt to put on rose-coloured glasses just for a moment – a fact we

have learned through our investments during times of crisis. For today, we are able to collect the rewards for our actions in the past.

A new start in Austria's politics also fills us with optimism. It looks like the new administration will finally tackle our rampant bureaucracy and cold progression. Thus, our employees would finally have more money in their pockets when earning more.

In this sense, we are pleased with the positive signs and recommend all sceptics to put on their rose-coloured glasses, at least every now and then.

Enjoy your summer and your holidays and make sure you come back healthy.

DI Horst Felbermayr

Horst Felbermayr

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## COVER PICTURE

## 2,000 square metres of shotcrete in six weeks

On March 6, Felbermayr's Specialist Civil Engineering Department began working on a temporary building pit supporting system in Bischofshofen (Salzburg province). To this end, it created a 23-metre-tall and 140-metre-wide shotcrete wall. Due to a geologically difficult initial situation, work could only be performed from top to bot-

tom at work heights of just one metre, respectively. At the start of the temporary construction pit system's construction, geological ruptures were secured using the dry-mix shotcrete method. Afterwards, the second layer was applied by means of the wet-mix shotcrete method. This construction method allows for a construction



progress three times as quick as the dry-mix shotcrete method, yet is associated with large technical efforts, making it suitable for large, connected areas only. In total, the 30 tonnes of reinforcements, some 300 cubic metres of shotcrete and 6,000 running metres of anchoring were installed for this construction scheme. The slope stabilisation measures' purpose was the construction of a residential complex.

## BIRTHDAY

Haeger & Schmidt celebrate their 130<sup>th</sup> birthday

A lot has happened since the foundation of Haeger & Schmidt – now a subsidiary of Felbermayr – in the year 1887. Tradition and innovation has characterised the company's eventful history throughout the decades. Today, the Group offers a wide range of logistics solutions. In 2016, some new developments were sent on their way in close collaboration with Felbermayr: New routes for the Haeger &

Schmidt subsidiary HSW Logistics, the expansion of rail transport to Rotterdam via the Kehl location, the use of shuttle ships for the power stations and the handling of large-scale projects on the Danube and the Rhine, to name but a few. Furthermore, it formed a new transport cooperation on the Upper Rhine, invested in the port area, expanded its forwarding and container activity in Antwerp, implemented a new railway

connection from Andernach to Antwerp and founded a new location in Weil.

Today, the Haeger & Schmidt Logistics Group employs more than 200 people across Europe and generates an annual turnover of hundreds of millions of Euros. The Group's core competences are inland navigation, projects, inter-modal transport, port logistics, short sea as well as shipping & forwarding.





## SPECIALIST CIVIL ENGINEERING Development road for quarry

In autumn of last year, the staff of Felbermayr's Specialist Civil Engineering Department finished the stabilisation of a development road towards a quarry in the Gastein Valley in Salzburg. To this end, they first installed a reinforced concrete beam that would serve as a foundation along a stretch of 50 metres using small bored piles. Building on that, they used umbrella-like shoring elements made from steel. Their frontal support area consists of a net spanning ten square metres each and is secured by a sturdy cross. These structures are back-anchored in the neighbouring rock using threaded anchors. After that, they are filled with mineral material layer by layer. Five such levels – on top of each other – were used



for the quarry's development. Thus, the stabilisation measure reached a height of 22 metres. Pitched stonework was used

to create the transition between the umbrella-like shoring elements and the natural terrain.

## BACKWIND Multi-modal Krefeld terminal is setting course for growth

Felbermayr's heavy-load port is currently performing some 80 lifting operations for the wind power industry per day. This translates into approximately 16,000 tonnes per month that the stationary crane Big Rocky as well as the crawler cranes LR 1750 and LR 1160 transship from water to road and vice versa. The wind towers mostly originate in Portugal

as well as the German cities of Emden and Magdeburg. In addition to the wind power components' transshipment, the Krefeld location's employees also process the entire distribution logistics including scheduling. The tower segments' main destinations are wind power construction sites in North Rhine-Westphalia. Regardless of this, Fel-

bermayr's Krefeld location remains a competent site for the storage and final assembly of power station components such as generators and transformers. The increased workload led to the creation of ten new jobs. Furthermore, Felbermayr will invest into yet another storage hall boasting 1,500 square metres of storage space at the site.



PHOTOS: ANDREAS KNITTEL, ARNO INGENLATH





**OPENING**  
**New logistics warehouse in Wörgl begins operations**

A mere seven months after construction had started, Felbermayr's Wörgl (Tyrol) location opened its new logistics warehouse in early May. The structure measuring some 3,600 square metres is equipped with state-of-the-art storage and lifting technology as well as an adjacent office wing and meets highest safety standards. Felbermayr served as the developer. The structure was constructed to

serve as a logistics hub for GE Jenbacher GmbH & Co OG, a manufacturer of gas motors. DB Schenker, using Felbermayr shuttle transports, hauls the motors to the logistics hall from the factory some 30 kilometres away.

Felbermayr serves as DB Schenker's logistics partner in operating business. In addition to Wörgl, Felbermayr stores the motors

weighing up to 95 tonnes as well as associated generators and other plant parts at its Linz, Sulzemoos and Krefeld locations. The motors are transported to these storage locations by Felbermayr's Heavy Haulage Department.

**CRANE MEETING**  
**Six cranes install a container crane**

Due to its high transshipment rates, Constanța port needed to install a new container crane. For its assembly, individual components weighing up to 240 tonnes were to be lifted into place – a tandem lift job for the Liebherr-produced cranes LR 1600 and LTM 1500. With its maximum load capacity of 600 tonnes, the LR 1600 was therefore equipped with a boom derrick and 298

tonnes of ballast. Other cranes used included one LTM 1100, one LTM 1130 as well as one LTM 1150 and one LTM 1250 with a maximum load capacity of 200 tonnes. Furthermore, three boom lifts with a working height of 43 metres each and one 12-tonne fork lift were used to assemble the crane. Overall, the job took 2.5 months and was completed in late October 2016.



**RESOURCES AND THE ENVIRONMENT**  
**Newly structured construction-related services**

Early this year, the waste management, gravel and ballast production as well as suction dredge rentals and landfill and forestry services activities were newly structured in the Resources and Environment Section. Wolfgang Pühringer, who has successfully worked in Felbermayr's Gravel and Ballast Production as well as Landfill and Forestry Service Departments has been appointed to the important position of this section's manager.



PHOTOS: PHILIPP LANG (2), MARKUS LACKNER, FELBERMAYR RUMÄNIEN





## EQUIPMENT RENTALS Lifting technology for a cold-rolling mill

Upper-Austrian aluminium manufacturer Amag expands its Ranshofen plant. From March 2016 to June 2017, Felbermayr's Lifting Technology Department used up to 15 mobile cranes, crawler cranes and

40 work platforms simultaneously to complete this undertaking. The cranes' maximum load capacity was 400 tonnes, the boom lifts' maximum working height 43 metres. Likewise parts of the squad

were fork lifts, telescopic fork lifts and mobile construction cranes. The equipment was predominantly used for façade construction and setting up support elements.

## SPIRAL RAMP CAR PARK Teaming up with Goldbeck Rhomberg, Felbermayr constructs a car park for Liebherr

In September 2017, Liebherr will hand over 633 parking spaces to its Bischofshofen (Salzburg province) employees. Felbermayr's scope of services includes subsoil improvement by means of vibrating tamper sealing, all concreting work such as the entire foundation, the construction of the spiral exit ramp structure as well as the installation of some 600 running metres of sewers to remove surface and roof water. However, Felbermayr's Building Construction Department was also responsible for asphalt laying and exterior design. Goldeck Rhomberg served as Felbermayr's consortium partner for the seven-storey building's construction.



PHOTOS: MARKUS LACKNER





## CO-PRODUCTION Felbermayr and Wimmer Machine transports to position rotating tower crane

Liebherr uses a rotating tower crane with a hook height of 163.4 metre in the context of the construction of a new production line at the Schelklingen cement plant. The crane named EC-H50 Litronic was set up by means of Felbermayr mobile cranes and with the help of its subsidiary Wimmer Maschinentransporte. To achieve this feat, cranes with 500 and 1,000 tonnes of maximum load capacity were used.



## CONSTRUCTION ENGINEERING Tunnel rehabilitation project on the Inntalautobahn motorway

As early as July 2016, Felbermayr's Project and Construction Engineering Department started rehabilitation work in the Wiltener Tunnel in Innsbruck. Their job was to restore the concrete layer of both carriageways as well as the western portal. The eastern portal was demolished and extended by eight metres. They furthermore applied bituminous sealing to a 12,000 square metre area in both tunnel portals while non-vegetated surface areas were coated using a special epoxy emulsion for weather protection. Up to a height of 3.8 metres, both tunnel tubes were clad in enamel panels to protect them from aggressive salts. The tunnel's roof was clad in cement-bound and glass fibre reinforced fire protection boards. Additionally,

they renewed the entire roadway surface's asphalt layer, amounting to some 13,000 square metres. The fact that, due to traffic, work could only be carried out between 8 p.m. and 5 a.m. didn't help construction

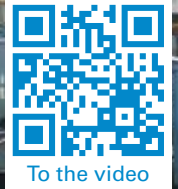
progress and required special construction site logistics measures. Work was complete in late June and both tunnel tubes were opened for traffic on schedule.







For the transport, the generator stator was hooked up in a »directly fastened« way.



To the video

## Rail transport of 482 tonnes

**At the beginning of December 2016, Felbermayr's Department for International Low-Loader Rail Transport (ITB) carried out the heaviest ever rail transport executed in Europe. A generator stator was transported with a total weight, including transport equipment, of 482 tonnes. A 32-axle jib carrier wagon was used to cover the rail journey in Poland.**

It was with relief for those involved in transport, when the stator reached its final destination at the Polish Jaworzno coal-fired power station, near Katowice, on 5 December 2016 at 4 pm. This had been preceded by years of planning, starting in 2012. In April of the same year, the ITB division was commissioned by Siemens Erlangen to carry out a feasibility study for the transport of a stator, together with transport equipment, from the German supply works in Mülheim/Ruhr to the Polish Jaworzno coal-fired power station.

### High performance

While the initial leg by ship to a Polish landing port could be very quickly established as feasible, special attention had to be paid to onward overland transport in Poland. The port of Gdynia was the first preference for landing. The port in the Gdansk region can also be operated by floating cranes, thus ensuring feasibility of transfer from the seagoing vessel to the rail wagon. After detailed investigation, it was finally confirmed that such a transport would be possible by rail using special equipment from ITB. Further detailed clarification of technical, logistical and commercial aspects spanned the next few years, until the project finally came to the implementation stage.

Rafako, the company responsible for the assembly of the entire power station unit, was also responsible for the Polish leg of

the transport operation. The company's subsidiary BEST Logistics, which was also responsible for the overall project, served as the contractor for performing transport upstream and downstream of the rail transport stage. For contractual reasons, the point of delivery between seller and buyer should now lie at the inland port Opole. A rail transport solution had also previously been established from Opole.

At the end of November 2016, the heavy load was transferred at Opole onto a special 32-axle wagon from ITB. The stator was lifted into a tension strap support frame provided by the shipper. As a result, a total of 482 tonnes were suspended in the jib carrier wagon. Such a weight has never been transported by rail in Europe before! Following various operational challenges, the stator arrived at its destination on 5 December 2016, in the late afternoon.

### Single Source Solutions

Apart from the core, rail transport task covered by the ITB division, Felbermayr and its subsidiaries also delivered solutions for all upstream and downstream services. For example, Siemens entrusted Haeger & Schmidt, in Duisburg, with the transport of the stator from Mülheim/Ruhr to Opole. The Polish customer, on the other hand, commissioned BEST Logistics with all services downstream from the rail transport to the machine shop. The

impressive display of service was completed by the supply of a 1,000 tonne lifting mast by Felbermayr-Krefeld and a 24-axle self-propelled transporter by Felbermayr Wels, for work within the Jaworzno power station. The various transport legs and overall sequences were coordinated by BEST Logistics.



The high-tech giant was transhipped for its transport into the nacelle by means of a 1,000 tonne lift frame.

And just for the record, ITB surpassed its own previous best with this rail journey. That was for a trailer weight of 475 tonnes, dating back to 2000, which was also a Siemens stator with tension strap support frame and pressure supports, for the Niederaußem coal power station in the Ruhr region.



# Small scale hydroelectric power station on the Danube Island

**Work on construction of a small scale hydroelectric power station has been in progress on the Danube Island in Vienna since June 2016. When it is finished the challenging civil engineering project will provide sufficient green electricity for around 130 households. The general contractor is the construction company Felbermayr, which is also responsible for static loading calculations, project planning and the hydraulic steel structures.**

**W**ith projected power generation of some 400,000 kilowatt hours per year, even among small hydroelectric power plants the power station is not a Goliath. But, as Construction Manager, Volker Brand, from Felbermayr's power plant construction division points out, from a civil engineering perspective it is an outstanding solution. As a result, the power station will be integrated into the already existing weir system, »Wehranlage 1«, on the Danube Island. As the main components of the power plant are built underground, there is no noise nuisance for the visitors to the Danube Island and visually the recreational area for the Viennese population is not affected at all.

## Special feat of civil engineering

The civil engineering techniques deployed over an area of 2,500 square metres have been more than challenging. „For example, in sealing the excavation pit for the so-called Archimedean screw shaft, we have used high-pressure soil compaction and driven 900 metres of drilled piles, as a secant pile wall, with a pile diameter of 90 centimetres,“ comments Brand. However, the construction of the penstock and draft tube structures also created challenges. For this reason, a sealed formwork box structure first had to be installed in the New Danube. This was then pumped empty. Only then was it



*The generator is driven by a hydrodynamic screw.*

possible to use core drilling and a sawing rope to produce the intersection in the river bank walls for the penstock. As Brand explains, the measures for driving a 1.4 metre diameter and 55 metre long concrete pipe included, „pressure grouting using full face tunnel boring, in order to be able to subsequently pass under an operating building between the turbine housing and the draft tube structure.“

So that the pipe could be correctly driven forward after passing under the operating build-

ing, a seven metre deep target cavity was necessary. This was formed with the use of sheet piling. However, jet grouting was also used for sealing and improving the static loading capacity of the subsoil. „This required mixing the soil under high pressure with a cement containing binder suspension“, explains Brand. In this excavation pit, the flow of the water was turned through approximately 90 degrees. This gave the shortest route to the river bank wall, and the water could be returned to the New Danube, after a further intersection in the wall.

The power plant is a joint project between the Wien Energie and the Municipal Department 45 responsible for Vienna's waterways. ■

*The project is funded by the European Regional Development Fund. Commissioning of the power station is scheduled for spring 2017.*





# 1,000 tonnes of service weight to lift a bridge into place

**In late April, Felbermayr's Crane Rentals Department lifted into place a 245-tonne bridge in Vienna. The construction of Vienna's new Main Station and the associated adaptation of the traffic system demanded this technically demanding crane project.**

**A** 33-metre-long and 14-metre-wide bridge will in the future be used as a road, pedestrian and bicycle bridge to significantly improve the traffic network in the main station's vicinity. The single-span steel trough bridge was delivered in four parts and completed on site. The architectural masterpiece weighs in at 245 tonnes.

## Crawler crane with suspended ballast

38 lorry transports were required to remove the crawler crane with its maximum load capacity of 750 tonnes. "Our set-up time for the steel giant with 485 tonnes of ballast was a mere three days," Michael Lehner from Felbermayr Transport and Lifting Technology reports. A mobile crane with a load capacity of 200 tons was used to assemble the crane on site. In the end, the crane was equipped with a 42-metre main boom and 31.5-metre derrick boom to optimally transfer the weights onto the suspended ballast.

To meet the static requirements to lift the bridge into place, compacted gravel soil was installed prior to the lifting procedure. "This was necessary to guarantee soil pressures of 40 tonnes per square metre and to not damage the asphalt," Lehner explains. Furthermore, it allowed to balance the crane's operating area which had a slight slope of some three per cent. Utilities such as sewage or power lines didn't have to be taken into account.

## Suspended transport with 240-tonne cargo

A time window of a mere five hours had been reserved for the lifting process itself.

"We started at midnight, right after the last tramway had passed," says Lehner and identifies the restricted space available as one of the greatest challenges. Once the team had removed a catenary, the bridge could be connected to the pulley. After

that, the crane – carrying the bridge – rotated to the right by about 50 degrees. Later, the crawler crane had to be moved 20 metres to reach the bridge's support points. Thanks to excellent weather and wind conditions, the crane operator had







*The 14-metre-wide bridge has been designed as a road, pedestrian and bicycle way.*

no problem following the spotter's instructions for he could not see the bridge's support points. Lehner comments that "wind speeds of more than 12 metres per second would have prevented us from lifting the bridge into place as the load could have started becoming unstable and could have endangered the operation." However, thanks to absent wind (a rather unusual thing for Vienna), the 245-tonne bridge could be lifted into place without any safety concerns by the crawler crane weighing 755 tonnes. The following months will see the completion of necessary traffic infrastructure meaning that the bridge will most likely be opened for traffic at the end of this year. Vienna's Municipal Department MA29 which is responsible for bridge construction and foundation engineering functioned as the client for this lifting project commissioned by Swietelsky. ■



*The crawler crane was equipped with 270 tonnes of suspended ballast.*









PHOTO: MARKUS LACKNER

**NEW BRIDGE FOR TYROL'S STUBAI VALLEY RAILWAY.**  
*Five segments weighing in at 60 to 183 tonnes were lifted into place for the construction of the new Mühlbachgraben Bridge in Mutters between May and June. Work was carried out by means of a crawler crane. The LR 1750 crane's boom measured 98 metres in length. The bridge itself is 153 metres long and some 43 meters tall. A new bridge had to be built as rehabilitating the more than 100 year old existing bridge including the Mutters Tunnel would have been just as expensive but less efficient. Construction is scheduled to be completed by the end of 2017.*





# Gigantic: Industrial construction for 700 staff

By late September, Felbermayr's Building Construction Department will have finished its largest building construction project to date in Marchtrenk (Upper Austria). There, they are to carry out master builder work for an office building, production halls and a show room. TGW Logistics Group, an international system provider for internal logistics solutions, had commissioned the giant project encompassing an area of some 40 hectares.

The ground-breaking ceremony took place in mid-November of last year. At an area of some 30,000 square metres, the two production halls including show room and offices will be twice as large as Venice's Piazza San Marco. Following its completion in mid-2018, the industrial structure will provide jobs for 700 office and production staff.

## Earthwork

"We are dealing with some 18,000 square metres of built-up area," says Construction Manager Gerhard Schelmbauer. This translated into correspondingly large humus and earthwork volumes. 5,700 square metres of earth were, for instance, used to build five-metre-tall banks serving as visual and noise protection measures for the local residents. Another 6,500 cubic metres of material were excavated for the structure's 1,500 square metres of basement. "This earth was

transported off and reused on site-related backfill," Schelmbauer adds.

## Soil improvement using vibro-replacement piles

1,262 vibro-replacement piles encompassing a total of 3,000 running metres were installed in order to give the soil the required load bearing capacity. "This method uses a spud vibrator's vibrations to temporarily neutralise friction forces, thus compacting the soil. The volume that gets lost in this process is compensated by simultaneously



The new building is scheduled to be move-in ready in April 2018.



Until late September, the office wing's carcass will grow to five storeys.



adding gravel material," Schelmbauer illustrates the measure to statically improve the construction soil.

A total of some 10,000 cubic metres of in-situ concrete are needed for this mega project. At a load volume of 7.5 cubic metres per mixing truck, this equals some 1,300 mixing trucks. No less impressive is the fact that 1,000 tonnes of reinforcements were required for reinforced concrete work. "This translates into some 50 lorry loads," Schelmbauer explains and continues to report that – due to many height changes, the basement slab's concreting presented a great challenge. However, the ground floor's construction had even more serious problems in store for the team. Schelmbauer: "The ground floor protrudes by a few meters on each side, yet is up to nine metres tall. This meant that we had to install 17 concrete pillars some ten metres tall. We used tension straps to align those down to the millimetre, even at the top." Yet, the formwork's erection at a height of nine metres was also quite taxing. We used special scaffolding towers since conventional ceiling supports would not have sufficed at this site. Nevertheless, the staff of Felbermayr's Building Construction Department had successfully mastered these challenges by late June and could build four additional storeys with some 2,500 square metres of space on top of the ground floor. All in all, a few thousand ceiling supports were used simultaneously, as Schelmbauer illustrates the technically challenging task which turned into a battle of material at times.



**220 sleeve foundations as supports were installed for the three halls.**

220 column footings were installed to build the pre-production and production hall with its 13,000 square metres as well as the 1,800-square-metre show room used for presentation purposes. The column footings measured six square metres and used up some 700 cubic metres of concrete and 50 tonnes of reinforcements. The halls were built using pre-manufactured concrete elements. Its walls consist of pre-manufactured sandwich elements with internal insulation as well as façade panels.

## Twelve kilometres of lines

The structure's liberal technical equipment and its dimensions were also apparent in

the electrical, sewer and drainage lines. "In some places, we are talking about trenches with a total of 28 pipes," Schelmbauer illustrates and estimates that – due to increasing demands towards building technology – the originally specified line length of 8,500 metres will rise to 12,000 metres.



**Foreman Jasmin Zulkic and Construction Manager Gerhard Schelmbauer strive for swift construction progress (from left to right)**

This includes the soakaway route for the roof drainage system. "For this system, we will install some 300 running metres of drainage pipes by the project's end," Schelmbauer says and adds that the soakaway route will encompass 14 soakaway pits with a diameter of 2.5 metres and a height of 3.5 metres.

Despite the tight schedule, Schelmbauer is optimistic that "we will make it and complete the master builder work by late September," and happy with his crew's swift construction progress on the site.



**The presentation show room will be 65,5 metres long and 27 metres wide.**



## Rockfall protection for world's largest ice cave installed

Ever since the touristic development of Eisriesenwelt in Werfen, the entrance to this wonder of nature is constantly being adapted. In autumn 2016, Felbermayr's Specialist Civil Engineering Department started another stage in protecting the path from rockfall. In the course of a six-month construction period, it installed a 47-metre gallery for visitors.

Often, the technical challenges of demanding construction sites characterise the work of Felbermayr's Specialist Civil Engineering Department, an organisation specialising in rock stabilisation in the mountains as well as temporary construction pit systems. This includes elaborate construction site logistics due to – in many cases – lack of storage space in alpine terrain. And it were these conditions the team found in the framework of the construction of a 47-metre visitor gallery for Eisriesenwelt Werfen in Salzburg Province.

"We knew it wouldn't be easy but that's not new to us," says Construction Manager Josef Messner who is used to working under difficult geological conditions with his team. However, before construction proper could begin, the construction site had to be protected from rockfall. "For this purpose, we have first installed rope protection anchorage points on the 50-metre-tall rock face." After that, we secured the rock formation prone to rockfall using rock anchors and jetcrete.

### Working 200 metres above a chasm

To be able to build the three- to four-metre-wide path, twelve concrete pilaster



At a total length of 42 kilometres, Eisriesenwelt Werfen is known as the longest ice cave in the world.

The gallery's roof was built on top of eight-metre-tall concrete columns.





*Construction of a 47-metre visitor gallery for Eisriesenwelt Werfen in Salzburg Province to protect visitors from rockfall.*



strips were first installed on the valley side of the rock face with its vertical drop of 200 metres and anchored 5 metres deep in the rock. All construction work was performed by skilled labourers specially trained to implement rock stabilisation who were secured on the steep rockface by means of cables and belts. The concrete needed was transported to the site in mixing carts with a capacity of just 2.5 cubic metres. "The path wouldn't have taken any more than that," Messner describes the difficult conditions.

Subsequently, eight-metre-tall concrete columns for the gallery's roof were built on top of said concrete pilaster strips. "To back-anchor the gallery's roof, we drilled 47 threaded anchors seven metres long and 47 millimeters in diameter into the rock and grouted them. Based on this, we adapted the form work and 20 tons of reinforcements for the gallery's roof," Construction Manager Messner elaborates. Even the 130 cubic metres of concrete needed for completion had to once again be brought to the construction site via the narrow access road using mixing carts. "Bang on schedule, we completed work on the construction site in mid-April,"

Messner happily sums up their successful and accident-free processing of the project. This ensures continued safe ac-

cess to Eisriesenwelt, the world's largest ice cave, with its cave network measuring 40 kilometres in total. ■



*The gallery's roof is fastened to the rock by means of 47 threaded anchors.*



# Concentrated power for wind farm

**Until autumn of this year, Felbermayr's Transport and Lifting Technology department will erect 13 wind power systems on the Styrian Handalm pasture. In addition to three large cranes, the feat will be implemented using a self-propelled modular transporter as well as a blade lifter for the rotor blade's heavy haulage.**

"We would have been ready to implement the lifting job in mid-April," says Günther Wimmer from Felbermayr's Project Department which, among others, specialises in multi-modal solutions for particularly heavy industrial goods. "However, due to persistent wintry conditions, the temporary road leading to the construction site could only be finished in early May," the seasoned heavy haulage expert explains.

Little wonder considering the fact that the transshipment site for the components weighing up to 67 tonnes is already located 1,400 metres above sea level. From there, a comfortable country road of 2.35 kilometres heads off in the direction of the construction

site. After that, one has to negotiate a two-kilometre logging road. The last seven kilometres to the wind power construction site 1,700 metres above sea level are covered on a temporary road. This translated into difficult conditions and great challenges that can only be overcome using special transport vehicles.

## Wind power system transport equipment

However, special flatbed trucks are not just used right before reaching the construction site, but also for ground transport from the manufacturer's factory to the transshipment site. Thus, so-called blade trailers were used to transport the 39.5 metre long rotor blades weighing in at 9.6 tonnes 1,300 kilometres. The tower segments 11.33 meters in length and 4.4 metres in diameter were transported in a self-supporting fashion using so-called tower lifters. Even double-telescoping semi trailers and semi flatbed trailers were used as convoys of up to three vehicles to transport the system parts to

their destination. The 208 road transport jobs departed from Magdeburg, Aurich and Emden in Germany. Due to the delay caused by the temporary road's belated completion, the team had to find an interim storage site as no appropriate area was available on site. They found it at the premises of Felbermayr's heavy-load port in Linz.

## Blade lifter overcomes 20-percent gradient

Even though the long-distance transports had many roundabouts and signal systems in store, transporting the components in the mountains posed the greatest challenges, says Wimmer. After all, the team had to negotiate tight corners and gradients of up to 20 per cent. Thanks to the blade lifter, the blades can be raised by 60 degrees. This makes it possible to negotiate tight corners lined with trees. Eight heavy haulage axles, pushed and pulled by two heavy haulage tractor units provide the required weight distribution and traction to drive in this difficult terrain.

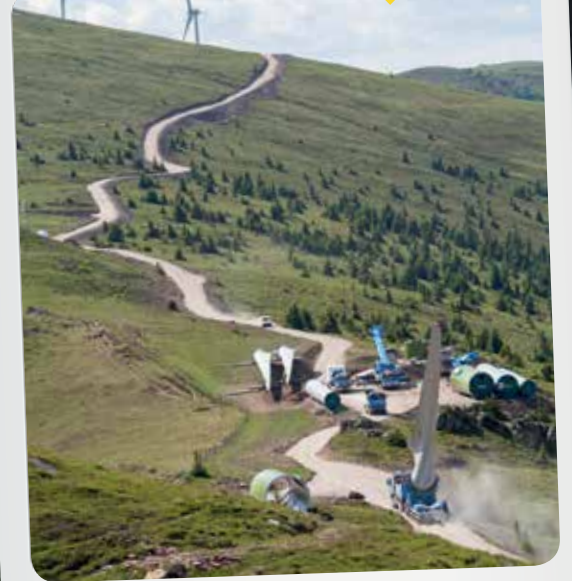
*Using pull and push tractor units, the team was able to negotiate gradients of up to 20 percent.*





*Only by raising the rotor blades using the blade lifter could the staff negotiate the tight corners lined with trees close to the road itself.*

*The construction site is located 1,700 metres above sea level and was developed via a temporary road.*





## Mobile crane with Y-shaped suspension to increase load capacity

Construction sites above the tree line also translate into difficult conditions for the lifting technology teams. Even for Liebherr's LTM 1750 packing the punch of 607 horsepower, it was not easy to reach the work site 1,700 metres above sea level. The crane operator had to use all his skill, safely driving the 108-tonne state-of-the-art lifting device across the mountainous terrain. Six transports carrying 144 tonnes of crane ballast and boom elements as well as the auxiliary crane with 200 tonnes of maximum load capacity safely reached the construction site.

Following a setup time of two days, the crane was equipped with 144 tonnes of ballast and its Y-shaped suspension and ready for the lifting job. "The client had specified

one week to set up one unit," Wimmer illustrates the tight schedule. Within this time, the team had to lift into place five tower elements weighing 25.5 to 66.64 tonnes, the nacelle including hub and stator as well as the three rotor blades. "Usually, this system type's blades are pre-assembled on the ground and attached to the nacelle using the star assembly method." Due to, in part, very uneven ground on site, this was not always possible, however. In such cases, the three blades had to be lifted to the hub 78 metres up in the air by crane. "This requires a lot of time and stable wind conditions," Wimmer adds. The main advantage of pre-assembling the elements on the ground, however, lies in the safety aspects as they don't always have to be lifted to such great heights.

Despite adverse weather including driving rain and squalls, extensive effort should make it possible to finish the last system on

the Handalm pasture in August, the project operators optimistically report. This is only made possible by the 29-strong Felbermayr team's experience and that of all companies involved in the project. For even the most sophisticated technology can only perform what people request from it.

By year's end, the 13 systems with a blade diameter of 82 metres are supposed to be connected to the grid. With their overall output of 30 megawatts, they will deliver renewable energy to some 21,000 households. This makes this wind farm the most powerful to date in Southern Austria. And yet, the project's implementation was not only about the system's technical data but also about strictly adhering to more than one hundred environmental requirements. This guaranteed maximum protection of the fauna and the neighbouring pastures and woods. ■

*Three large cranes (LTM1750) with a maximum load capacity of 750 tonnes were used simultaneously to lift the system components into place.*

*Self-propelled modular transporters (SPTM) and heavy duty axle modules attached to tractor units were used to transport the tower segments.*





# Five axles on tour

In June, Felbermayr's Transport and Lifting Technology Department was deployed in the name of art. During this job, they hauled an approximately three-tonne bronze statue from Winhöring in Bavaria to Michaelerplatz in Vienna and erected it there. The freight was a likeness of antiquity's most famous horse – Alexander the Great's war horse Bucephalos.



Once set up, the artwork stood nine metres tall on Michaelerplatz.



points at a height of six metres by means of a loading crane with an outreach of 20 metres. Our installation personnel reached the installation points using a truck-mounted platform as well as a loading crane equipped with a work cage." After two nights, they had made it. The giant horse from ancient history adorned Michaelerplatz in front of the Spanish Riding School until late June. The nine-metre-tall and six-metre-long sculpture has been exhibited to commemorate the Spanish Riding School's traditional Fête Impériale summer ball. ■

Artist Pietrzyk says about his work that "the statue represents bravery, freedom and the ability to overcome our preconceptions – such bravery is important in the shaping of our future."

Artist Andrzej Pietrzyk's work is some four metres tall, six metres long and weighs in at three tonnes. Considering the fact that the cast bronze freight's centre of gravity was very high and the horse is only standing on three legs courtesy of the so-called »Spanish walk« it becomes obvious that this valuable freight was prone to tilting. "We solved this problem using an inloader as it is commonly used to transport pre-manufactured concrete elements," Thomas Pamminer from Felbermayr's Heavy Haulage Department in Wels explains. Thus, the transport height was kept below four metres which meant it could effortlessly negotiate bridge underpasses and overhead lines it could potentially run into on its route.

## Putting the horse on its foundations

The heavy haulage transport to Vienna stopped in Linz for a break. There, the horse was set up as a trial in early April.

"The artist wanted to make sure the statics had been calculated correctly and that the foundations would be able to support it," Pamminer illustrates the reason for the stop. In late May, the valuable cargo was once again stowed away and secured. Thus, the golden horse could make the journey to its final destination of Vienna. "Since Michaelerplatz in Vienna's first district belongs to the hackney carriages by day, we were only allowed to start working at 10 p.m.," says Pamminer and illustrates the installation job: "First, we placed four concrete foundations – each weighing some 3,000 kilograms – on the ground. After that, we attached symbolic umbilical cords in the shape of metal rods to the foundations. In addition to the structural challenges involved excavations of Roman sites surrounding the foundations made our work difficult. Thus, the three-tonne work of art had to be bolted to eight installation



Apart from the transport, lots of Felbermayr equipment was used for its installation too.



## From soldier to entrepreneur

**Exactly 100 years ago, Franz Felbermayr, father of today's senior director Horst Felbermayr fought – side by side with countless comrades – at the front lines of World War I. His outstanding achievements in battle and the origins of the family-run company Felbermayr are part of the latest exhibition in Wels' City Museum.**

"My father was born in 1891 in Asten close to Linz and was drafted for military service as early as 1912," owner and Chairman of the Supervisory Board Horst Felbermayr reports on his father's life which was, at first, deeply shaped by difficult economic conditions and large-scale political tensions in all of Europe.



*Gisela and Horst Felbermayr talked with Head Curator Major Jörg Loidolt.*

### Private Franz Felbermayr

September 1917: Istria with the city of Trieste and South Tyrol are still part of the Austrian Empire. 'Hessians' from Wels and Linz fight the advancing Italians at the front lines. Their goal was to defend the Trieste region. Specifically, their regiment had been ordered to storm Monte San Gabriele located some 50 kilometres north of Trieste.

During the storm on this 650-metre mountain, Franz Felbermayr, part of the Imperial-Royal infantry regiment, distinguished himself with particular determination. Thus, it is written in private Franz Felbermayr's reward application that he stormed the mountain together with a few of his comrades, seized a machine gun from the enemy unit – which fought back desperately – in hand-to-hand combat, took firing position and the advancing Italians under fire, causing them to flee in wild panic. After that, the port city of Trieste remained under Austrian control. For the bravery he exhibited in this campaign, Franz Felbermayr received high military honours. "However, his fight for his homeland was soon forgotten once World War I was over," Felbermayr remembers his father's stories: "The people at home tried to yank the standards off the returning soldiers' uniforms." The rest is written in the history books – with the Treaty of Saint-Germain of 1920, South Tyrol was given to Italy, as was the city of Trieste the two factions had so fiercely battled over.

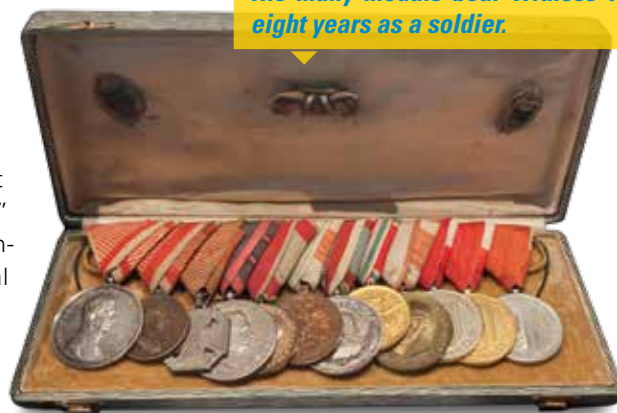
### The foundations of the family-run business

And yet – defying the depression of the inter-war period – Franz Felbermayr remained resilient and, a mere two years after the end of the war, applied for a permit for trading goods domestically. His company was founded on 16 November 1920. Three years later, together with his wife Maria, he took over his parents' tavern in Raffelstetten close to Asten in Upper Austria while working as a taxi operator in the 1930s. "In 1942, my father finally opened a freight transport company in Wels," Felbermayr recounts and highlights that this marked the real birth of his transport, lifting



*Franz Felbermayr as a soldier in 1917.*

technology and construction company which today operates all across Europe. Then, in 1967 I took over the company with my wife Gisela. "Today, my grandchildren are in charge," a happy Felbermayr says about the company's continued positive development under the leadership of his son Horst and daughter-in-law Andrea.



*His many medals bear witness to eight years as a soldier.*



## RETIREMENTS

## Well-earned retirement

**W**e would like to express our gratitude and appreciation to those employees who have recently retired. It's them who have – some of them for decades – supported the growth of the group and significantly contributed to its development.

**Salve de Martino** – Cranes/Wimmer Maschinentransporte · **Gerd Richter** – Landfill construction/Hagn Umwelttechnik · **Barbara Burzik** – Billing/Haeger & Schmidt · **Klaus Minneken** – Conventional Inland Waterway Transport/Haeger & Schmidt · **Gerd Awe** – Loading Master in Transshipment/Haeger & Schmidt · **Johannes Hanke** – Cranes/Spremborg · **Frank Lange** – Cranes/Spremborg · **Frank Michelson** – Cranes/Bautzen · **Jürgen Plötz** – Surveying/Reinhold Meister Wasserbau · **Johann Blumhagel** – Port Transshipment/Linz · **Herbert Eckert** – Heavy Haulage/Wels · **Heinz Kalousek** – Transport/Lanzendorf · **Herbert Kemetner** – Transport/Linz · **Alfred Kirchmeier** – Crane/Linz · **Cezary Kozlowski** – Transport/Lanzendorf · **Istvan Nincsecs** – Transport/Lanzendorf · **Erich Petzl** – Heavy Haulage/Wels · **Helmut Thöne** – Projects/Wels · **Sonja Baier** – Project and Construction Engineering/Zederhaus · **Karlheinz Braumann** – MTA/Wels · **Manfred Dirnberger** – Civil Engineering/Salzburg · **Alois Grader** – FST/Salzburg · **Johann Hackenbuchner** – MTA/Wels · **Anton Mayer** – Power Station Construction/Wels · **Karl Söllner** – Construction/Wels · **Friedrich Winkler** – FST/Salzburg · **Josef Ortbauer** – Tinsmith/IS Baubetrieb · **Bernd Lohmann** – Transport/Bau-Trans/Lauterach · **Reinhold Perktold** – Administration/Bau-Trans/Lauterach · **Otto Steurer** – Cranes/Bau-Trans/Lauterach



## Prize draw

**Prize question:** *Where is Felbermayr's Building Construction Department currently working on its largest building construction project to date?*

You can find the answer in this issue. From all those sending in the correct answer, we draw 15 winners who will receive non-cash prizes.

Please send in the correct answer by **e-mail** [informer@felbermayr.cc](mailto:informer@felbermayr.cc) or **Fax** +43 7242 695-144. The closing date is the **31<sup>st</sup> of October 2017**. All decisions are final and not subject to legal appeal.

**1<sup>st</sup> prize:** A GMK 6300 L at a scale of 1:50 A quality product from Conrad.

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**Layout:** Markus Weickinger · **Free subscription:** You have not yet subscribed to the »INFORMER«? You would like to receive it entirely free of charge twice a year and have it delivered directly to your door or would like to order it for someone else? Go to [www.felbermayr.cc/informer](http://www.felbermayr.cc/informer) For the sake of linguistic simplification, all statements in this document are to be understood as gender neutral. **Printed in:** July 2017





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