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si

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From the idea ...



Kurt Wieser

A look across the pond

The European cable transport and winter sports industries are looking back upon a successful year 2014/2015. Owing to their expertise and product innovations, European companies have become global market leaders in many areas. In both North and South America, customers appreciate the high quality supplied by companies based at the very heart of ski sports, the Alps.

Si Seilbahnen International has been a partner to this market now for more than 30 years. The magazine is the leading platform for the European cable transport and winter sports industries and provides information to interested industries far beyond Europe as well. With our foreign-language magazines, we attend trade shows in Beijing (China), Moscow (Russia), Santiago de Chile, Grenoble (France) and Bolzano (Italy), meeting them where they go.

This is also true – as a matter of course – in the USA. Again, we carry a „best of“ issue specifically compiled for the American market.

Enjoy reading!

Si

More than 30 years competent Media-Partner for the international Ropeway and wintersport Business



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Developing and designing **innovative solutions** for mountainous areas



Ischgl: A possibly Record-breaking Ski Area Access

DOPPELMAYR to build new feeder line

At Ischgl, a leading mountain resort in Tyrol, winter sports enthusiasts get to the slopes non-stop directly from the village center riding the new Pardatschgrat Bahn. With 1,251 meters (4,100 ft.), the 3S Bahn covers the greatest difference in altitude of all tri-cable gondola lines in the world.

During the 2014/15 winter season, Ischgl presented a great technical innovation. On November 27, the day the resort opened for skiing, the new Pardatschgrat Bahn commenced operations. In less than 10 minutes, it takes winter sports enthusiasts from the village center directly to the Pardatschgrat at a 2,624 meter (8,600 ft.) altitude – as a possible world record, without an intermediate station. The wind-resistant tri-cable gondola covers a difference in altitude of 1,251 meters (4,100 ft.), the greatest worldwide.

Passengers should have absolutely no fear of heights, however, as the greatest ground clearance is 138 meters (453 ft.). 31 gondola cabins custom-designed for Ischgl take 28 passengers each to the



The new Pardatschgrat 3S Bahn takes winter sports enthusiasts in less than 10 minutes from the village center directly to the Pardatschgrat at a 2,624 meter (8,600 ft.) altitude – as a possible world record, without an intermediate station. Photos: Si/Wieser

ski slopes. They offer better comfort with seats for all passengers.

With an investment volume amounting to about 70 million Euros (US\$ 75 Mill.) spread across two years, Silvrettaseilbahn AG spared no expense to extend the quality offering of the Silvretta Arena even further.

Plans to build the new line were triggered by capacity shortages on the old Pardatschgrat line with its smaller gondolas, going up the mountain in two segments. Full four-passenger cabins coming from the base station often led to waiting lines at the intermediate station for the



The top station of the line was attached to the existing station building. It offers a barrier-free connection to the Pardorama restaurant.

subsequent ride to the top, especially in the morning hours.

In an attempt to improve this service for guests, Silvrettaseilbahn AG decided to demolish the lower section of the old Gondola and build a totally new line without an intermediate station – the new tri-cable gondola.

The upper section of the old line remains in operation. It now runs under the new name 4-MGD Pardoramabahn from the old intermediate station to the top station. This way, the attractive runs from Pardatschgrat to the intermediate station and in the Velill can be used without any waits.

New base and top stations

Due to space limitations in the valley, designing the base station



31 gondola cabins custom-designed by CWA for Ischgl take 28 passengers each to the ski slopes.

was a significant challenge. The station is now divided. It features an infrastructure wing with ticket windows, ski depots, shops and rental stations and the technical wing with a parking building for the gondola cabins. The two wings are connected by a generously dimensioned bridge.

An elevator and escalators take passengers from one level to the next.

The top station of the line was attached to the existing station building at its eastern side. It offers a barrier-free connection to the Pardorama restaurant.

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Service

2015 sons

The most advanced Ropeway Technology in the world is coming to Mayrhofen

New Penken brings better quality

The beginning of construction of the new bridge at the Penkenbahn bottom station in the fall of 2014 marked the first step in the process of building the all-new, state-of-the-art 3S Gondola Lift on Action Mountain Penken.

On the 13 April, at the end of 2014–15 winter season, the construction will begin at the bottom station in the center of Mayrhofen. Construction of the massive support pillars and summit station will begin at the same time.

Before the start of the 2015–16 winter season, the bicable gondola lift currently in use will be replaced with the most modern ropeway system on the market.

The new Penkenbahn will provide passengers with a quick, comfortable, and quiet ride, plenty of room, and fantastic views of the Zillertal Alps surrounding Mayrhofen.

Each of the 33 gondolas will have seats for 24 passengers and



The new Penkenbahn will provide passengers with a quick, comfortable, and quiet ride, plenty of room, and fantastic views of the Zillertal Alps surrounding Mayrhofen.

Mayrhofen Penkenbahn Technical Specifications

| | |
|-----------------------------|--|
| Type of ropeway | 3S system with closed cabins for up to 24 passengers seated (optional 8 additional standees) |
| Altitude at bottom station | 654,7 meters above sea level |
| Altitude at summit station | 1.790 meters above sea level |
| Altitude difference | 1.135,3 meters |
| Number of pillars | 3 pillars pillar 1: 45 meters pillar 2: 20 meters pillar 3: 15 meters |
| Performance Specifications: | |
| Transport capacity | uphill: 2.880 passengers/hour downhill: 3.840 passengers/hour |
| Gondola capacity | uphill: 28 passengers (24 seated + 4 standing) downhill: 32 passengers (24 seated + 8 standing) |
| Number of gondolas | 33 gondolas |
| Travel time (one way) | 8,2 minutes |

will be able to transport a maximum of 2,880 passengers per hour up to the ski resort. During the evening peak hours, there will be room for an additional 8 standees, resulting in a downhill capacity of 3,840 passengers per hour. As a result, waiting times will no longer be an issue.

Furthermore, the new Penkenbahn has been designed so that, in case the system comes to a standstill due to a technical problem, an emergency, or a power failure, for instance, the gondolas can be retrieved using two independent standby drives. Therefore, once the new 3S Gondola Lift is completed, a rescue gondola will no longer be needed.

Large and practical storage areas at both the bottom and summit stations will have plenty of room for storing ski equipment.



Anyone who is interested can follow the progress of the construction of the new Penkenbahn in the online report at www.mayrhofner-bergbahnen.com.

Furthermore, rental stations, shops, and service facilities will ensure a great skiing experience for everyone. Guests will be able to stroll

through town or head to an après-ski bar without being burdened by all of their own gear. Anyone who is interested can closely follow the progress

of the construction of the new Penkenbahn in the online report that will be available starting in April at www.mayrhofner-bergbahnen.com.



Each of the 33 gondolas will have seats for 24 passengers and will be able to transport a maximum of 2,880 passengers per hour up to the ski resort.

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HANS HALL: “Last” independent supplier of groomer tracks

Last action hero?

The mountain industry is characterized in practically all of its segments by what some call “duopoly” (by contrast with a monopoly, with two companies dominating the market).

A similar development can be observed among suppliers of groomer tracks. *Si* discussed the recent developments on that market with the only remaining supplier who is independent of groomer manufacturers:

You are now left as the last remaining independent supplier of groomer tracks. What is your view of the current market situation – from the suppliers’ point of view ... and from that of users?

Just like previously in the lift and snowmaking sectors, market concentration in this area is constantly growing.

Competition, ever so important for buyers, is by and by eliminated from the market. This gave rise to de-facto monopolies. Customers are 100 % at their mercy, which greatly slows down motivation for innovating. Customers are left out in the cold.



The brothers Hans (r.) and Werner Hall are the third generation to run the family-owned business.

Groomer manufacturers reason that their products are ‘original’ components. How do you handle this argument in discussions with customers?

We are a specialist supplier. This implies that for 35 years, 100 % of our know-how has been going into the development of tracks and track components. For vehicle manufacturers, on the other hand, the tracks represent only a small portion of the development of the entire machine. Finally, “original” is not synonymous with “high quality”.

What feedback do you receive from regular customers about why they are using HALL products?

Without any exceptions, we are receiving positive feedback from our customers. Growing numbers of regular customers show that our efforts in developing and providing high-quality tracks and replacement parts for tracks are being honored.

Our products are valued for their continuous improvement, longevity and superior price to performance ratio.



An innovation HALL introduced to the market last year is groomer tracks in customers’ CI colors.

Photos: HALL

How loyal are customers in this business field? (Does the quote/negotiation game start anew every time someone buys a track?)

There will of course always be negotiations. Even so, the number of loyal customers is growing at a steady rate.

What is the role tracks are playing in the overall grooming system? (economically, ecologically, in terms of snow and slope quality?)

Next to the blade, the track has a key role: Climbing power, easy maneuverability and compacting are the fundamentals of good grooming.

From an economic point of view, the track is tremendously important, as it is decisive for soil-conserving grooming and saves energy as well as other resources due to its long economic life. This is why the track has an important role for finance and administration as well.

Bring "Color" to the track's life

What is the market for groomer tracks generally like? How many tracks are used up every year?

It is clearly a displacement market. For HANS HALL, Things look bright, though: We sell continuously growing numbers of tracks and track parts.

We are also busy establishing a second hand market, offering to our customers an in-house overhaul of their tracks. This is a concern to us not least for ecological reasons.

Last year, you have for the first time introduced colored tracks to the market. How was this innovation received by your customers and how are these tracks actually utilized?

These colored tracks have had a real "Wow!" effect. Groomers are more and more used as a central part of their owners' corporate design. This is where our tracks now fill a significant gap. The amount of positive response and the number of orders took us by surprise.



Still close to customers: The ongoing exchange of experience with users allows quick implementation of requirements discovered during practical use in continuous product enhancement.

How will the market for groomer tracks develop over the next five years and where will your business be then?

The track market needs to adapt to changing conditions. "One size fits all" is a myth and a thing of the past.

This is exactly our special unique selling point.

We are prepared and we have plans to continue being the innovation leaders in this segment in five years just like we are today.



innovation with a real "Wow!" effect: Colored tracks by HANS HALL.

SUFAG -MND:

A Multitude of Snowmaking Solutions

Confronted with the uncertainty of climate development, variations in guest numbers and the necessity of controlling operating costs, the management of technical snowmaking will be in future be a great challenge requiring a consistent approach.

In this context, SUFAG has set itself the objective to develop and offer a wide range of snowmaking systems adapted to the individual framework conditions. Taurus 2.0 and PEAK are two SUFAG products developed to meet the above challenges.

Taurus 2.0

How can a snowmaker be developed that produces high-quality snow and due to the design of its nozzle head at the same time delivers a good performance in marginal temperatures as well?



The new lance Taurus 2.0 starts at a wet-bulb temperature of -2°C (28°F) and achieves a snow production of up to $25\text{ m}^3/\text{h}$ ($880\text{ ft}^3/\text{h}$) at 60 bars (870 psi) water pressure. Photos: SUFAG

Such were the questions that the SUFAG development team asked themselves in the fall of 2012 when drafting the concept design for the Taurus 2.0. To finalize this project,

the team had to take various aspects into account.

With the aid of a ballistic study, the optimal angle for the water jet at the lance head was determined. This was a decisive factor, as the snow mass generally depends upon and changes with the time the water particles are airborne.

The longer they are, the better the snow quality. Using a Taurus 2.0, a snow quality of 300 to $400\text{ kg}/\text{m}^3$ can be achieved.

The first tests were performed in France in 2012, at Valmeinier (Savoie) and Gerardmer (Voges), followed at the start of 2013 by further testing at Orelle (Savoie). These tests ultimately confirmed expectations towards the Taurus 2.0 snowmaking lance. 200 lances were sold during the first year.

All in all, currently some 600 SUFAG Taurus 2.0 are being used.

During the past season, Taurus 2.0 lances were offered and sold in Austria as well. Wildkogelbahnen in Neukirchen had a total of 8 autonomous snowmaking lances installed.

Due to the terrain conditions, 3 of these are used in a 6 meter version. The snowmaking results fully



Other member of the MND Group: Based in Bavaria (Germany), LST Ropeway Systems specializes in designing and manufacturing cable car systems for ski resorts or transportation systems.

satisfied the operators of the snow-making facilities at Neukirchen who already requested a quote for more lances to be installed next season.

Jean-Armand **Navetch**, SUFAG design engineer, explains: "The Taurus 2.0 starts at a wet-bulb temperature of -2°C (28°F) and achieves a snow production of up to $25\text{ m}^3/\text{h}$ ($880\text{ ft}^3/\text{h}$) at 60 bars (870 psi) water pressure.

Taurus 2.0 is an attractive snow-maker, efficient yet compact and lightweight – easy to handle and attend to for the snowmaking team."

PEAK

SUFAG also committed to the development of high-efficiency solutions. One of the core products is PEAK, the new generation of fan-type snowmakers capable of producing up to 96 m^3 ($3,390\text{ ft}^3$) of snow per hour with an average throw of 40 meters (131 ft.).

Development of PEAK started in 2010. At that time, the aim was to design a new snowmaker to combine the best properties of SUFAG and ARECO with respect to snow quality, production capacity and also noise level. Another important criterion was the reduction of energy consumption.

The design and test phase lasted for about 3 years and production



Since 2013, more than 300 PEAK were sold to various ski resorts across Europe.

started in August, 2013. In addition to a considerable noise reduction, a significant cut of the snowmaker's energy consumption was achieved, with measurements showing a 20% reduction without compromising snow production, neither in marginal nor in low temperatures.

Since 2013, more than 300 PEAK were sold to various ski resorts across Europe. With over 150 units sold, Austria represents the largest share. A total of 41 Compact PEAK is in use at Wagrain Bergbahnen. Most of the machines in Wagrain are operated on gun lifters to achieve higher snowing performances espe-

cially in marginal temperatures. Wagrain is one of the big SUFAG customers and like Mayrhofen, Zell am Ziller, Reiteralp (20 Compact Peak), Ofterschwang (5 Compact Peak), the Hündle Bahn in Thalkirchdorf, the Imbergbahn Steibis in Oberstaufen and many more has been trusting exclusively in the quality of SUFAG products. Schladming / Hochwurzen also purchased 10 Compact Peak last season, increasing the number of PEAK in use there to 19.

In 2014, first orders for PEAK were taken from the American and Asian markets, which are very promising for the years ahead.



TAS is the world leader in remote natural hazard prevention systems. For more than 20 years, TAS technologies have been protecting ski resorts.

DOPPELMAYR-GARAVENTA to build new line up Jakobshorn in Davos:

Third Generation Comfort

There is no denying it: Aerial tramways are what most people have in mind when they think about cable-based transport or, as some call it with a collective term, ropeways. Accordingly, the new Jakobshorn line in Davos, Switzerland, is among the technological beacon cableway projects in Switzerland this year.

Like Parsenn Bahn, Jakobshorn Bahn counts among the most important feeder lines of the Swiss winter sports resort that is not only rich in tradition but also claims to be the highest-altitude town in Europe. Within the portfolio of *Davos Klosters Bergbahnen AG*, the Jakobshorn is the mountain for sports and partying. The line itself starts in the Davos-Platz part of town and goes to Jschalp. The new aerial tramway facilitates a massive improvement in passenger comfort and doubles capacity. This gives Jakobshorn, a mountain known for its many different restaurants and for its popularity among freestylers, better accessibility than ever.



Plenty of room: Although the size of the CWA cabins would have allowed for 110 passengers, the operators' main focus was on improving comfort more than capacity.

Following installations in 1954 and 1983, the new line is the 3rd generation. It obviously fulfills all of today's visitor requirements to speed and comfort.

"Considering only its technical condition, the existing equipment could well have been used another 15 years or more," says Operations Manager, Jürg Müller, during the **Si** site inspection. "We nevertheless just wanted to offer our guests a new line with its main focus on improving comfort more than capacity."

While it is true that with the new 100 passenger cabins, transport capacity doubled, but this number

alone shows the claim to comfort. The size of the cabins would elsewhere have been used to pack 110 passengers into each of the cabins. "Particularly freeriders like voluminous backpacks, and they require extra space".

There never was any doubt that the solution would again be an aerial tramway. At the base station's location in a residential area building the much longer station required for a detachable system was out of the question, and noise emissions were also an issue among neighboring residents. "The noisiest element in an aerial tramway, on the other hand, is the passengers themselves." The cabins as well as the station buildings present themselves in bright signal red.

The new base station is situated between the 1954 and 1983 sites. The intention is to honor tradition and to facilitate a comparative view of the architecture spanning six decades.

Winter sports enthusiasts enter the building from behind, reaching the platform to enter the cabins by the shortest path. To facilitate this 'rapid access', a sophisticated technical solution was found for traction cable tensioning. The cable is diverted and led to the tensioning weight at the front end of the platform, effectively outside the station building.

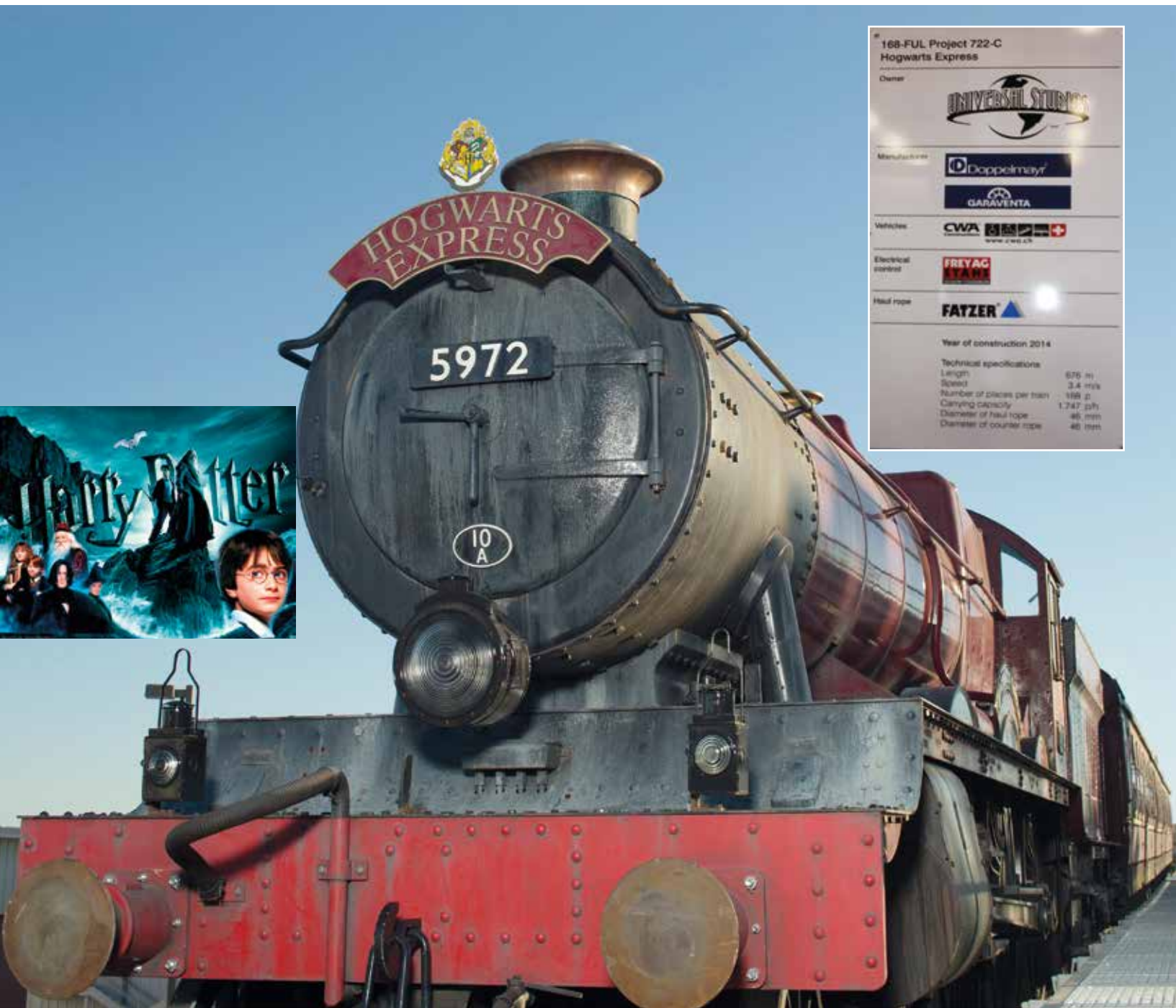


Cabin and station in bright red – giving the appropriate signal for the sports and party mountain.



Outstanding Universal Studios Orlando theme park attraction made in Switzerland

A High Technology Nostalgic Experience



| | |
|---|-----------|
| 168-FUL Project 722-C Hogwarts Express | |
| Owner | |
| Manufacturers | |
| Vehicles | |
| Electrical control | |
| Haul rope | |
| Year of construction 2014 | |
| Technical specifications | |
| Length | 676 m |
| Speed | 3.4 m/s |
| Number of places per train | 188 p. |
| Carrying capacity | 1.747 t/h |
| Diameter of haul rope | 46 mm |
| Diameter of counter rope | 40 mm |



Two Universal Studios theme parks in Orlando linked with Swiss Precision

Hogwarts Express makes Dreams come True

In a top secret project, a new and unparalleled attraction of the Florida entertainment landscape was planned and built. The Swiss specialists in all aspects of cable-propelled transport systems, GARAVENTA, CWA, FREY and FATZER, exported European ex-pertise as well as highly esteemed personal support to Florida. Universal Studios management is just as enthusiastic about the results as visitors are. Linking Universal Studios Florida® and Islands of Adventure® theme parks, the Hogwarts Express from the Harry Potter books and movies has been attracting record-breaking visitor numbers since it opened in June of 2014.



Justin Schwartz, Senior Manager Ride and Show Engineering (left) and Dale Mason, Vice President of Universal Studios, found congenial partners in the Swiss experts.

Justin and Dale have the kind of gleam in their eyes only fairytales can light up. Dale fondly strokes the train compartment's interior, solid mahogany with the "signs of wear and tear" of an old railroad coach. Even the fingerprints generations of passengers could have left lend the comprehensive measure of authenticity to the compartment that creates emotions in both the youngest and the most senior passengers.

Justin looks out of the window at the passing scenery of good old London. While the train is rolling through a tunnel towards the fantastic world of writer Joan K. Rowling, there are noises outside the compartment. Shadows are cast and voices can be

heard. They belong to the young wizards, Harry Potter, Ron Weasley and Hermione Granger, who are on their journey between their two worlds. "It is simply fantastic. There are people so excited about this trip they have taken the ride several times since the line opened," says Justin. It truly is an unlikely adventure to experience an imagination of Harry Potter's journey from Kings Cross station in London to Hogsmeade in the world of wizardry with his friends within a 4 ½ minute train ride. "Everything is affectionately hand-crafted to the finest detail," adds Dale, stroking the upholstery. "Only the finest and most durable materials were used. After all, the train runs 365 days a year, carrying over 30,000 passengers

every day." Justin and Dale are enormously pleased by what they managed to create with their large team of more than 150 people.

Justin Schwartz is a Senior Manager of Universal Studios Florida®, Dale Mason is a Vice President. In a way, it looks like the two have turned a boyhood dream into reality. There is, however, much more behind that project than simply having a vision.

Universal Studios does not leave anything to chance. Not the minutest of details. The company's claim is to deliver perfect amusement without any malfunctions. It takes the best partners to achieve this. "It is incredible, we had not seen anything like that before," says Dale, "This



perfection left us flabbergasted. „The system worked extremely well. On the first day of system previews, everything was working perfectly. Normally, teething problems persist for several months after opening. No such bad luck with system provider GARAVENTA and the companies that parent DOPPELMAYR had brought on board, FREY AG for the control system, CWA for the construction of the vehicles and cable specialist FATZER.”

All-round attention is what the team in charge of the project at Universal Studios received. From fact finding trips made together to get acquainted with the possibilities to the implementation of the plans with such precision one could speak of congruency. “Our partners were

slightly surprised, though, about our requirements when it came to taking into account each and every small detail,” the Vice President says with a smirk. “They are instrumental in the conversion of views and impressions into true sensation and emotion, which is exactly what makes our attractions special. There is not a single slip-up that could tear Visitors delving into the lives of Harry Potter and his friends out of their dreams.” All the way through development and construction, new ideas were born. Sometimes the craftspeople were skeptical. “They were horrified when we had them mistreat the valuable mahogany so it got the required patina,” Dale recalls. “By and by, though, they better understood our intentions and in the end,

we are all proud of what we jointly achieved.” For planning work and assistance during the construction of the railroad line as well as implementation of the installation, four GARAVENTA staff spent more than a year in Florida. They were supported by experts from DOPPELMAYR USA. Next to excursions to train stations and old railroads in Scotland, numerous visits to the CWA cabin manufacturing shop at Olten, Switzerland, were among the most important steps during the early stages. “Obviously, this took a lot of time and effort, but somehow it was like making a boyhood dream come true,”



Following an intense water resistance test outside the CWA production halls in Olten, Switzerland, the Hogwarts Express left Europe for the Orlando, Florida Universal Studios.

Upon arrival, the new Universal Studios visitor magnet is put on its track.



Justin and Dale agree. “Being able to combine vintage historic railroad romance with 21st century technology as we did using the elaborate control system from FREY is simply fantastic. “Three years passed from the first stages of the design phase until construction started. “As soon as the Wizing World of Harry Potter was completed, we had started sympathizing with the idea of linking both parks. We had considered various means of transportation. Then, one day, the idea to use the Hogwarts Express hit home,” Justin describes the birth of the concept. The installation then took slightly more than one year to build, as disturbing operations in either of the two theme parks was out of the question.

While in the workshops both in the USA and in Switzerland various components were produced, some ideas took on a life of their own, each of them adding complexity and authenticity to the project.

At all times, a team from Switzerland was involved. “This was quite a thrill. We have here a group of about ten individuals who thanks to the marvelous training given by the GARAVENTA team became real experts. Responsibility is high, and so are the standards we are setting ourselves,” Dale Mason adds.

The guided tour of the security room, a glimpse of the train’s safety systems, and interviews with staff on the platform and in the closed environment of the surveillance chamber – it all feels like a national security affair. This is obviously not the case but visitors come to enjoy themselves so they could not care less about how their safety is guaranteed as long as it is. There are numerous surveillance

screens, each train compartment is monitored. “Anything that happens between people anywhere can happen here as well,” says Justin with a smile. “We need to be prepared and ready to interfere if necessary.” In such a way that operations continue undisturbed.

„Aside from the safety and security team, maintenance technicians are on the premises daytime and at

night. Then is the time to inspect every little detail so operations can start again the following morning, with no incidents while every seven minutes the train starts to carry Harry Potter fans from the world of the Muggles to the Hogwarts and back.

After many months of flawless operations, Dale and Justin still greatly enjoy using every opportunity to personally accompany special guests on that remarkable journey. Ah

GARAVENTA Mastered a Thrilling Project

From the Best for the Best

The project was so secret it did not even have a name. The codename only meant something to a small group of GARAVENTA staff involved in the project. The plan was too hot, too great was the danger that competitors might try to

hop on. For quite some time, employees did not even know much about the train at all. Rumor had it that the intention was to build a Wild West steam train. It was not until later in the project that it transpired the train would carry a world-famous



A lot of 21st century technology and expertise was required to facilitate a joyful “journey” through the fantastic world of Harry Potter on the comfortable Hogwarts Express.



name and that accordingly standards were elevated.

Niklaus Moser was overall project manager while Sepp Gisler was technical project manager. They were in charge of the 70 meters (230 ft.) long Swiss masterpiece weighing 110 metric tons (121 US t). When the contract was closed in 2011, it was quite clear to the two experts that theirs was an extraordinary assignment. What they were confronted with did not in any way lack in challenges and required much sensitivity.

“On the other hand, a project like this is naturally very special to us, something we tackle with great pleasure and that thanks to the high level of expertise of our staff we can implement perfectly,” says Niklaus Moser. Right from the start, they worked in close co-operation with DOPPELMAYR USA, where Steve Kirner was in charge. As principal supplier, GARAVENTA took the best

Swiss partners on board, while the steel bridge on which the train runs to take passengers from one Universal Studios theme park to the other was made in the USA.

“Never before was a cable line just like the Hogwarts Express built. By comparison with other installations of a similar type, our design engineers were facing tremendous challenges such as very tight curves, a high vehicle mass and an enormous cable tension. The installation has two drive trains only one of which is used in regular operations,” Sepp Gisler adds. “Not counting the time spent by CWA engineers, the project took some 30,000 hours of engineering time.” As many as 15 GARAVENTA staff were often involved in this project simultaneously during development and construction. From static calculations to quality assurance to the numerous meetings, many of which were video conferences, to commissioning and

supervision of the installation work that took place step by step through half a year. Chief installer, Samuel Kaufmann, spent a whole year in Orlando with his family so that there was a competent contact person on site at all times.

Technic Details HOGWARTS EXPRESS

2 trains consisting of 1 locomotive, 1 tender and 3 coaches for 56 passengers and one attendant each

| | |
|-----------------------------------|-------------|
| Year of construction | 2014 |
| Line Length | 2,218 ft |
| Speed | 3,4 m/s |
| No. Trains | 2 |
| Traction cable diameter | 1 13/16 in |
| Cable pulley diameter | 1 13/16 in |
| Cable pulley diameter | 15 3/4 in |
| Gauge | 70 55/64 in |
| Weight locomotive/tender | 32 tons |
| Weight coach | 26 tons |
| Drive unit “north station” | |
| Required nominal power | 215 kW |
| Required peak power | 626 kW |



On-site inspection. From left Jérôme Tschanz, project manager, FREY, Samuel Kaufmann, chief installer, GARAVENTA, and Steve Kirner, project manager, DOPPELMAYR USA



Below the surface, the fanciful fairytale train is technically speaking a cable liner with its time-tested, reliable drive system.



Swiss expertise from cabin makers CWA enchants visitors

The Cherry on the Cake of a special Project

It takes the best to achieve this! Scarce and far between are examples of balancing the reality of cutting-edge technology and the emotionality of a nostalgic train ride through a fantastic world of living dreams as successful as the Universal Orlando Resort. The requirement specification read: Nothing but the

best! “We knew that something big was afoot, but we would not have dreamed just how comprehensive and finely detailed this project was to develop,” Oscar Javier Garcia admits. Together with Hanspeter Weidmann, he was assigned project manager for CWA, with operations manager Daniel Hüppi at their side. They

are both relieved now and proud, and rightly so. The train has triggered a veritable storm of enthusiasm. “In spite of the challenging requirements, all went rather well. We managed to fulfill the tight schedule as well as the very demanding requirements from our customer with top precision,” says Oscar Javier Garcia.



Daniel Hüppi (left) and Javier Garcia were in charge at CWA for the successful fulfillment of that select job.



Custom body design for the US customer. From basic structure to detail finish, Millimeter by Millimeter made exactly to measure.



A train awaiting transport: The finished masterpiece outside the CWA production halls in Olten, Switzerland, weighs 100 tons, much less than its prototype. Visually, though, they are identical.

To supplement their own teams, the CWA experts took the best external suppliers on board. “It really fills us with enormous pride to have such excellent handcraft businesses in Switzerland. What we received from our subcontractors truly is the kind of top quality that is hard to come by these days,” remarks Daniel Hüppi, highlighting the outstanding performance.

The body of the steam engine was entirely made of plastics while



the coaches have Aluminum bodies. For their production, specific tools were required. “We made a copy of reality. This unerring precision was a tough nut to crack. Lamps or hat racks, doors or handles – it all had to be exactly like on the train in the movie. Universal has commissioned a number of renowned artists who with their expertise helped make the brand-new train leave the impression of a meticulously renovated historic train with a steam engine and carriages,” the two CWA experts express their respect for the work of their partners from Universal.

These were in turn excited about the Swiss craftsmanship. “Aside of perfect workmanship, the ‘natural signs of wear and tear’ that lend authenticity to the coaches were key,” says Garcia. Behind the scenes, high technology takes care of air conditioning and a perfect sound. Instead of coal and water the tender holds several racks full of electronics for comfort functionalities as well as the astounding illusions such as the

rattling of the train. There are cables after cables, tons of them. 21st century technology behind an aged front for the creation of which six painters were specifically trained to paint as “imperfectly” as back then.

What makes the CWA team particularly proud? There is hardly a commissioning without any changes. The Hogwarts Express went into operation without a single modification.

All CWA staff involved in the project agree: „We were selected to design and build the cherry on the cake of the Hogwarts Express. And that was quite a thrill.“ They have built a historic train that received acceptance by the Universal management. It was a “Yes!” that was anticipated with great tension and received with big pleasure. Within the first month of operations, the Hogwarts Express made in Switzerland

land carried more than a Million enthusiastic passengers without any complications whatsoever from day one. Dale Mason and Justin Schwartz from Universal take off their imaginary hats to this, too.



Perfection in the implementation of another vision as well: The cable liner is hauled using FATZER cables. Viewers see a steam train on railroad tracks.



Thousands of manipulations performed by select specialists made the engine and the coaches 100 percent lookalikes of the ones used in the movie.



Es „dampft“ durch Schottlands Grün.

FREY AG supplied automation solution for the Hogwarts Express

Command Center of Success

Behind grey cabinet doors or in the engine's tender, a vitally important part of the Hogwarts Express is hidden from the views of park visitors. It is the automation control system, the heart and central intelligence controlling the precise operation of all functionality of this new attraction in Universal's Orlando theme parks. FREY AG from Stans, Switzerland, supplied this masterpiece of precision and safety.

Since March of 2012, a small project team at FREY AG in Stans, Switzerland, was busy developing the heart of the enchanting Hogwarts Express. It took the engineers quite a bit of meticulously detailed work until each action – from air conditioning to the virtual dream, from special effects to simply ensuring that the train always

moves safely and in the right rhythm – functions perfectly at the click of a button. To achieve this is a prerequisite for creating the impression of moving on a train that moves as if led by Wizards from one world to another. Close to if not identical with the prototype in the movie, with the illusion perfectly controlled by the “knowledge” flowing through thousands of miles of cables.

The team led by project manager Jérôme Tschanz found itself confronted with an absolutely novel challenge. The professionals with a reputation for their expertise in funiculars had to convert their knowledge to US standards. Documents were created and diagrams drawn that were tailored to the project's requirements and the materials used. “More than 70 percent of the cables serve show effects in the 42 compartments such as the

control of the projectors outside the windows or the light, smoke, rocking and air effects. All of this had to be installed in a very limited space,” says Jérôme Tschanz.

At first, the individual compartments were pre-wired. Installation followed. By and by, each of the three coaches, the tender, the externally controlled wheels and the engine were connected to form a complete unit. Thousands of links in pursuit of one goal, the flawless sequence of each little detail and of all special effects. For the final stages of the work including commissioning, Jérôme Tschanz spent four months in Orlando, just like part of the FREY AG installation team before him. Now the line is operating. Every day, 24 hours a day, permanently monitored by thoroughly trained the Universal Orlando team members.



In the mock-up room of FREY AG in Stans, Switzerland: Project manager Jérôme Tschanz is in charge of the FREY control system. He and his team created thousands of miles of “intelligence in cables”.



One of the power cabinets, this one controlling the animated wheels and drive parts of the ‘steam’ engine.

SNOWsat fleet management

Always with our finger on the pulse

Kässbohrer Geländefahrzeug AG is also keeping its promise to continually refine and develop the SNOWsat snow and fleet management system for the 2015/2016 season.

Optimization is their permanent goal – even though or precisely because SNOWsat proved itself so impressively on the market last season. The high number of sales and satisfied customers is ongoing validation of this.

A lively exchange with them is very important – and gives an insight into needs in practice.

The biggest innovations and optimizations will come in the area of fleet management.

This system records information like position, speed, direction of travel and working time, but also registers the most important vehicle data like engine data, status of winches and tillers, lights, alarms, drivers, cost centres etc. By evaluating this with the SNOWsat software, operators can identify potential savings and optimizations. Implementation leads to dramatic reductions in fuel consumption and, thus, pollutant emissions, in wear and tear and in maintenance.

Moreover, the data also provide security in the event of claims. This analysis of vehicle data makes an effective cost control possible in the first place. Ski resorts do not just operate snow groomers – they are dealing with a mix of different vehicles and equipment. SNOWsat fleet management now supports all conceivable vehicles in the resort – from snow groomers and snow-mobiles to diggers.

The new SNOWsat V1 vehicle hardware has several CAN interfaces, plus digital/analogue inputs to record diverse vehicle data and also facilitates driver identification and detailed cost centre management.



Kässbohrer Geländefahrzeug AG has also updated the SNOWsat software components CAN and Fleet: both are now based on a universal user interface, which has been especially optimized for the needs of ski resorts. Supervisors can access a full overview of processes in the ski resort in less than 5 minutes.

Customers have repeatedly requested it and we have quickly realized it: both, CAN and Fleet, are now web-based, meaning they can be accessed on all mobile end devices, such as smartphones, tablets etc. This makes it easier for supervisors to make decisions quickly, even if they're away from the office.

This new software is automatically available as a free upgrade to all existing customers with a valid service agreement from the new season onwards.

Anyone wanting to equip additional vehicles or test out the new software please contact his PistenBully dealer or talk to them at the Interpalpin.

Kässbohrer Geländefahrzeug AG is also keeping its promise to continually refine and develop the SNOWsat snow and fleet management system for the 2015/2016 season.



New features which newly can be accessed on tablets and smartphones.

PistenBully at the InterAlpin 2015 in Innsbruck

The big meeting of the PB family

Anyone visiting Kässbohrer Geländefahrzeug AG at this year's InterAlpin will as always encounter some genuine highlights. First the latest Tier 4 final engine technology, which Kässbohrer Geländefahrzeug AG is the first manufacturer to have implemented and sold worldwide.

The PistenBully 400 ParkPro will finally be officially presented to the public. The InterAlpin also provides a platform for the presentation of a world first with revolutionary features.

Tier 4 final - engine technology

One of the show highlights is also a highlight for our environment: in December 2014, Kässbohrer Geländefahrzeug AG became the first snow groomer manufacturer worldwide to introduce the new Tier 4 final exhaust standard onto the market.

Since then, PistenBully with the clean engine technology have been put to daily use in their first ski resorts. The progress is impressive: 23 vehicles now produce the same level of pollutants that would have come from one vehicle alone under the Tier 1 standard.



What makes the PistenBully 400 ParkPro different is its 100-percent orientation to park needs.

The engineers at Kässbohrer Geländefahrzeug AG have managed to combine ecological and economical advantages, developing a new generation of engine that is not only environmentally-friendly, but also saves resources and is cost-effective to run. You can see the possibilities that the new Tier 4 final engine technology offers using the example of the PistenBully 400 ParkPro.

PistenBully 400 ParkPro

The story behind the development of the PistenBully 400 ParkPro is

unique and is an example of how Kässbohrer Geländefahrzeug AG continually breaks new ground to set standards with innovative products.

The motivation for it came from the world's best shapers and park developers – the project was realised in close collaboration with our partner Schneestern.

What makes the PistenBully 400 ParkPro different is its 100-percent orientation to park needs. The park builders were involved right from the start, as Kässbohrer sought their requests and ideas.



The PistenBully 600 E+ is the first snow groomer worldwide with a diesel-electric drive and is now also a genuine success story.



The PistenBully 600 W Polar SCR is a powerhouse that really covers ground and does not capitulate even in the face of difficult terrain.

In line with their requests and suggestions, the PistenBully 400 ParkPro was turned into reality in just 1 year – from the first market research to series production.

Today it is the ultimate tool for park preparation. Although it was developed for the highest demands of the professional sector, its main area of use will be in smaller and beginner-friendly family parks and funslopes, the new trend in ski resorts.

Schneestern will also be on show at the InterAlpin. The leading European snow park developer designs and realises parks at the highest level. Show visitors will, thus, have a chance to find out about

the snow park theme first-hand.

SNOWsat

With SNOWsat, Kässbohrer Geländefahrzeug AG offers a completely matured product that was specially developed for ski resorts and that has the entire knowledge base of Kässbohrer behind it.

With high-quality components and the latest technologies, it is a professional solution that is optimised for the vehicle technology and equipment of a PistenBully, but also works with third-party vehicles. The extremely precise snow depth measurement and linking of snow production and slope grooming, facilitate greater efficiency in the



SNOWsat: With high-quality components and the latest technologies, it is a professional solution that is optimised for the vehicle technology and equipment of a PistenBully.
Photos: KÄSSBOHRER



Kässbohrer Geländefahrzeug AG became the first snow groomer manufacturer worldwide to introduce the new Tier 4 final exhaust standard on to the market.

operations of the entire vehicle fleet, leading to a reduction in overall operating costs of up to 15 %. Show visitors can experience all the facets of this system in the special showroom.

PistenBully 600 W Polar SCR

There are vehicles that set standards in their sector and take a leading role, which can be relied upon even under extreme conditions and against which the competition have to measure themselves.

The PistenBully 600 W Polar SCR is one such top dog: a powerhouse and workhorse that really covers ground and does not capitulate even in the face of difficult terrain. At the InterAlpin we will demonstrate what makes it the totally reliable premium machine for even the

trickiest slope.

PistenBully 600 E+

The PistenBully 600 E+ is the first snow groomer worldwide with a diesel-electric drive and is now also a genuine success story. Soon after being launched, it has become a firm feature on the slopes, thanks to its impressive performance values, high cost-effectiveness and low environmental impact.

With this unique combination it manages to harmonise ecological and economic interests. 20 % lower fuel consumption and 20 % lower pollutant emissions are arguments that carry weight and that no slope manager can really ignore.

To say nothing of the drive and handling. The PistenBully 600 E+ has truly earned its place at the InterAlpin once again this year.



Panoramic view from fine leather chairs high above the Seven Seas – An experience offered by Royal Caribbean Cruise Lines from 2015 with the help of GANGLOFF. Photos: GANGLOFF Cabins

GANGLOFF developed sensational “flying” cabins for cruise ships

Hovering over the 18th Deck

Marc Pfister and his team have been proving for decades that the established cabin manufacturer GANGLOFF, originally based in Berne, Switzerland, is a master of custom built large body cabins.

It comes as no surprise that the Flums-based cableway manufacturer, BARTHOLET BMF, has merged with this master operation. Together, they will continue to coin cabin standards at Seftigen, some 15 km (10 mi.) south of Berne.

Not only for the winter tourism industry, though, as the most recent example illustrates. GANGLOFF cabins will give cruise ship passengers a lift 50 meters (164 ft.) above the 18th deck.

It is called “QUANTUM Class” and consists of the three newest and biggest cruise ships of the “Royal Caribbean Cruise Lines”, 18 decks tall and equipped with every luxury. High above the top deck, the new sensation is waiting. It was designed and built with major contributions by GANGLOFF Cabins.

“It was the Swedish crane manufacturer who contacted us. He was contracted by the Royal Caribbean Cruise Lines to build a crane to lift a large, ball-shaped cabin to a height of 50 meters (164 ft.) and swivel it out to sea where passengers would float some 90 meters (295 ft.) above the waves. We are in charge of the ‘ball’,” says Marc Pfister, General

Manager of GANGLOFF. “It posed a great challenge, even for us, in spite of all the expertise and experience we have in cabin making, particularly with large-body cabins with special requirements. This project, however, was quite a task for our design engineers.”

Already completed, the first of the three luxurious ships, the “Quantum of the Seas”, lies at the MAYER WERFT shipyard in Bremerhaven, Germany. It is, by the way, the biggest ship ever built in a German shipyard. The crane is mounted and the cabin is also in its place already. Numerous test runs were performed, as the laws and regulations in force for shipping even surpass those for

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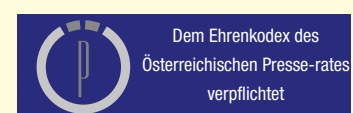
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alpine cable-driven transport systems. The cabin weighs 4.5 tons and is suspended from a 40 meter (131 ft.) crane arm. It is equipped with leather seats in settee form as well as single seats similar to the ones used in jet boats. Its all-round glazing is made of a special glass material for elevated climatic comfort that protects against too strong sun rays on the one hand and can be heated during cooler times utilizing an innovative metallic coating.

The ball is a fully welded structure made of premium stainless steel. It is 4.5 m (15 ft.) long, 3.7 m (12 ft.) wide and 3.5 m (11' 6") high and gives room to 15 passengers for every ride to dizzying heights. Passengers board the ball from a platform on the glass roof of a bar. This makes watching a memorable experience.

The first cabin has been mounted, while the second is being assembled and preparations are under way for the third.

Core Business Cableways

In parallel to these activities, work on various cabins for cableways are running at full speed. And so is continuous development work on improvements of comfort and safety, packaged in exclusive designs. GANGLOFF is currently developing a new generation of gondola-type cabins for BMF. It will first be deployed at Lenzerheide, Switzerland, this year. Furthermore, the Spacecab series was extended by the GA 10 ten-seater. And the merger with BMF starts to bear fruit more and more visibly.

www.gangloff.com



BMF BARTHOLET to build a mixed line in Northern Russia

Winter sports in the polar light

Kirovsk is a town on the Kola Peninsula in northern Russia. The Swiss cable transport system specialist could build another ascending facility – with cabins and chairs sharing one cable.

For Bartholet Maschinenbau AG (BMF), things started in this Russian region in the winter of 2013, when operations of the first BMF installation commenced and immediately attracted much attention by skiers and snowboarders.

It was the first fix-grip quad chairlift in the area, boasting a length of 1,066 m (3,500 ft.) and a transport capacity of 1,750 passengers per hour. The vertical height between base and top stations is 244 m (800 ft.).

The outstanding creativity of BMF designers and engineers manifests in the architecture of the base station.

This gave the attractiveness of the ski resort 'under the shimmering polar light' a boost. It made Kirovsk more attractive not only for domestic tourists but also for visitors from neighboring countries.



Chairs and cabins on the same cable – the outstanding combination for expert skiers who do not want to unbuckle and for comfort-seekers who appreciate the wind protection and safety of the cabins alike.

Photos: BMF

Since 2014, there are direct flights to Kirovsk from Moscow and Saint Petersburg.

This helped the development of the ski area to continue. In the winter of 2014, the next BMF installation



In the winter of 2013, BMF built its first line in Kirovsk, a fix-grip quad chairlift spanning 1.066 meters (3,500 ft.). Left: The two stations.

was built in Kirovsk. Following current trends, it is a combination line with chairs as well as cabins. With 36 chairs and 36 cabins, it gives skiers and snowboarders a lift.

The combination line spans a length of 1,659 m (5,443 ft.) and a vertical height of 438 m (1,424 ft.). It links the southern and northern parts of the ski area, enabling skiers and snowboarders to enjoy their sport starting from the town Kirovsk.



With the mixed line straight from town to the mountain.



The combination line with offers a transport capacity to 2,400 P/h; trip time is 5.5 minutes at a speed of 5m/sec.

Transport capacity amounts to 2,400 P/h; trip time is 5.5 minutes at a speed of 5m/sec.

The new six-chair & 8-passenger cabin line was officially inaugurated in December, 2014.

It is living proof of the fact that Swiss cable transport system quality is sought for beyond the Polar Circle just as well.



A six-chair hanger, followed by an 8-passenger cabin.



The BMF chair was designed by PORSCHE DESIGN and is as popular in Russia as it is everywhere else on the globe.

VON ROTZ & WIEDEMAR of Kerns, Switzerland:

New Vehicle for the Louvie Aerial Tramway

All-year access to the surge chamber of the Lake Louvie storage power station is vital for its operators. This is why VON ROTZ & WIEDEMAR AG was contracted to build a new vehicle in compliance with the EU cableways directive 2000/9/EG.

The Fionnay-Louvie aerial tramway was built in 1961 by WILLY BÜHLER of Berne as a single track tramway.

The line in the picturesque Val de Bagnes in the Swiss canton of Vaude (Wallis) does not (as yet) carry tourists but solely serves as access route to the surge chamber of the power plant and for fast, weather-independent troubleshooting of its installations.

To keep this an active access in the future, the power company



The cabin has an Aluminum-clad hot galvanized tubular steel frame.



Work on the aerial tramway in the tunnel.



New carriage with clamps, without track rope brakes

Photos: VON ROTZ & WIEDEMAR

decided to completely replace the vehicle. Having presented the best offer, VON ROTZ & WIEDEMAR AG was selected out of numerous bidders. After all, the task was far from an “off the shelf” solution.

The top station is in a tunnel where space is restricted. There are intermediate loading platforms on both towers and the existing pedestals should continue to be used.

One of the requirements called for the bay in the base station to be used if at all possible without any alterations.

Last but not least, the cabin required a door on its uphill front and a standing platform for manually removing snow outside the tunnel.

The new cabin was therefore designed to be as long and as wide as the previous one but higher, so as to give passengers more headroom.

The cabin has an Aluminum-clad hot galvanized tubular steel frame.

It has two doors: one lateral sliding door (with a greatly improved clear opening) and one double door at the uphill front. Upon request from the operators, the access ladder was designed just like the one on the previous cabin. Of course, the cabin also features panoramic glazing, but the “look” of the old cabin was kept.

The cabin program of VON ROTZ & WIEDEMAR AG is perfectly suited for special requirements and unusual design ideas can be implemented as well.

A new suspension was built using a closed tube instead of the previously open profiles. The maintenance platforms were built much like the ones previously used.

The 6-roller carriage design without track rope brakes was not used for the first time. It is equipped with two spring-suspended clamps that are connected to the continuously spliced traction cable.

Carriage, suspension and cabin are proprietary designs of VON ROTZ & WIEDEMAR AG.

Technical Characteristics

| | |
|---------------------|--|
| Track length | 1,245 m (4,085 ft.) |
| Altitude difference | 652 m (2,139 ft.) |
| Payload | 6 Passengers or 480 kg (1058 lb.) |
| Speed | 3.0 m/s |
| Track cable | locked coil wire rope ø 26 mm (1 1/32 in) |
| Traction cable | endless stranded wire rope ø 15 mm (19/32 in) |



VON ROTZ & WIEDEMAR AG: a new vehicle, compliant with the EU cableways guideline 2000/9/EG.



An aerial tramway grants access to the surge chamber for fast, weather-independent troubleshooting at the installations of the storage power plant.

MOUNTAIN PLANET – SAM:
APRIL 13 – 15, 2016 (GRENOBLE, FRANCE) ALPEXPO, organizer of the MOUNTAIN PLANET trade show (formerly SAM; *Salon de l'Aménagement en Montagne* or Show on development in mountainous regions), has set **April 13 – 15, 2016** as the date for next year's show. An ambitious package of advertising activities was launched to prepare a specialized audience for the great international industry event for the French-speaking world.

Advertising activities on three continents ... In a few months, on July 31, 2015, the venue for the 2022 Winter Olympics will be announced. The choice is between Almaty, Kazakhstan, and Beijing, China.

MOUNTAIN PLANET 2016 will be of great significance for the 2022 Winter Olympics, providing opportunities to get in touch with trade partners for alpine technologies and equipment from all over the planet.

In 2014, MOUNTAIN PLANET had a presence at the INTERMOUNTAIN trade show in the Czech Republic and at the SKI BUILD EXPO in Russia and will present itself during this year and the start of 2016 on nine more international trade shows: At the ALPITEC China 2016 in Asia, a fast growing market, at the EXPO ANDES in Chile and in Europe, at ALPIPRO in France, at the Alpine shows in Norway, at INTERLAVEX in Slovakia, at SKI BUILD in Russia and at ALPITEC in Italy.

Together with its partner, Domaines Skiabiles de France (Ski Resorts of France), MOUNTAIN PLANET will additionally give presentations at meetings (Fianet) and congresses (NSAA National Convention & Tradeshow, San Francisco).

It is the stated goal to compile a comprehensive offer with as many exhibitors as possible so MOUNTAIN PLANET can present even more innovations to a continuously growing number of international visitors – specifically from countries that are decisive for the development of winter tourism destinations but also for area planning with cable lines in cities, mountainous areas or mines.



SAM • GRENOBLE • FRANCE

SALON DE L'AMÉNAGEMENT EN MONTAGNE

MOUNTAIN PLANET – SAM: APRIL 13 – 15, 2016 (GRENOBLE, FRANCE)

About Mountain Planet: The SAM (Salon de l'Aménagement en Montagne or Show on development in mountainous regions) was established in 1974 in Grenoble, France, under the aegis of Jean Baccard, general manager of ALPEXPO at the time, and Michel Drapier, architect and later publisher of various industry magazines specialized on topics relevant to mountainous regions.

It was the place "where man and mountain are engaged in a dialog". The original of the contemporary slogan of the show ran: "L'homme et la montagne font le point".

Since then, the show has been inviting the specialists of the moun-

tain industry for winter as well as summer resorts and the "developers for urban design" with a particular focus on cable-driven transport systems to Grenoble for the big exhibition, the conferences, debates and colloquiums held in even-numbered years.

Mountain Planet 2014 numbers:

- **833 exhibitors and brands**
- **42,000 m2 (452,000 ft²) exhibition area**
- **15 fields of activity**
- **15,000 visitors**
- **20 % international visitors**
- **60 represented countries**



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